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This is the first issue of the Middle East Journal of Psychiatry and Alzheimer’s which we hope will fill the current gap in this field. The Mission of the Journal is to promote psychiatry, and Alzheimer’s related research in the Middle-East. The ME-JPA is a new peer-reviewed journal to meet the needs of scientists, practitioners, policymakers, and the patients and communities they serve in the Middle-East.

The Journal will publish original clinical and educational research of interest to psychiatrists, geriatricians, primary care physicians, practicing clinicians, residents, and others involved in services for psychiatric & Alzheimer’s related problems in older people.

People in the Middle East share certain cultural, social and economic characteristics, and have similar aspirations. Psychiatric morbidity in the Arab world is underestimated. This is due to the fact that few epidemiological studies have been done in the field. Screening of representative samples of primary health care patients in Saudi Arabia and the United Arab Emirates (UAE) demonstrated psychiatric morbidity of 26 and 27.6 % respectively. Unofficial data in different nursing home facilities in Lebanon revealed 25 to 30 percent of depression among residents and 10 to 15 percent of dementia.

A paper from Egypt looked at cognitive impairment among residents of elderly homes in Cairo. The authors stressed that cognitive impairment has a great impact on quality of life of the elderly. Residents 60 years old and over, males and females, were recruited from five geriatric homes, distributed all over Cairo. All participants were subjected to comprehensive geriatric assessment, including; Cognitive function assessment using Mini-Mental Status Examination (MMSE), Depression screening using Geriatric Depression Scale-15 items (GDS15), and Functional assessment using Activities of Daily Living (ADL). The study revealed that the prevalence of cognitive impairment was 20.9% among the studied group. The author concluded that cognitive impairment is correlated to the dependency level. Early recognition and management of cognitive impairment can improve the elderly’s independence.

A prospective cross sectional study from Qatar and the UK, looked at Psychometric validity and reliability of the Arabic version of the Patient-Doctor Relationship Questionnaire (PDRQ): Are patients satisfied with their psychiatrist? The main aim of this study was to make an Arabic adaption of the international Patient-Doctor Relationship Questionnaire (PDRQ) that assesses the quality of patient-doctor relationships in the psychiatry setting. The study sample included 1054 Qatari and other Arab psychiatry patients aged 18 to 65 years. A standard forward-backward procedure was applied to translate the English version of the PDRQ to Arabic. Internal consistency defined by Cronbach’s alpha coefficient was used to assess the internal consistency of the translated instrument. Finally factor analysis using principal component analysis (varimax rotation factor solution) was performed. Results showed excellent psychometric data on the internal consistency with Cronbach’s alpha coefficient =0.921 for the total instrument. The two-factor structure was loaded which jointly accounted for 60.2% of the variance. The authors concluded that the Arabic 13 item version of the PDRQ has been validated in its Arabic translation.

A second paper from Egypt looked at Cognitive Function in Egyptian Elderly with Chronic Kidney Diseases. A total of ninety non demented elderly, 48 male and 42 females, were included and divided into three groups. All participants underwent neuropsychological assessment using Consortium to Establish a Registry for Alzheimer’s Disease Assessment Packet (CERAD). Subjects on hemodialysis and those with abnormal renal functions performed worse in most items of CERAD, than those with normal renal functions. There was no statistically significant difference between the three groups regarding affection of Global cognitive function assessed by the Mini-Mental Status Examination (MMSE). High S.cr and BUN levels were associated with poor cognitive performance. The authors concluded that CKD patients either on hemodialysis or not, have poorer cognitive performance than those with normal kidney functions.

A pilot survey from Al Jinan University in Lebanon highlighted Alzheimer’s disease in the North of Lebanon. The author’s aims were to shed the light on the prevalence of AD in the North of Lebanon, and investigate the influencing risk factors involved in causing and promoting the disease in the area. A total of 180 questionnaires were distributed in the NRL; 165 were collected. The survey was distributed randomly to health institutes and home care facilities. AD was present among 12% of the studied sample with a double percentage of females compared to males which is a strange value worth further studies. The authors concluded that there is need to carry out more elaborate studies in order to arrive at sound epidemiological data.
Abstract

Objective: The main aim of this study was to make an Arabic adaption of the international Patient-Doctor Relationship Questionnaire (PDRQ) that assesses the quality of patient-doctor relationship in the psychiatry setting.

Design: This is a prospective cross sectional study conducted during the period from April 2009 to July 2009.

Patients and Methods: The study sample included 1054 Qatari and other Arab psychiatry patients aged 18 to 65 years. A standard forward-backward procedure was applied to translate the English version of the PDRQ to Arabic.

Internal consistency defined by Cronbach’s alpha coefficient was used to assess the internal consistency of the translated instrument. Finally factor analysis using principal component analysis (varimax rotation factor solution) was performed.

Results: The mean age of the studied psychiatry patients was 38.6±13.4 with male:female ratio 1:1. The mean score of the patient doctor relationship questionnaire was 3.67±0.78 and means range between 1 and 4.85. Skewness values are negative for all the items showing one sided skewness to the left. Results showed excellent psychometric data on the internal consistency with Cronbach’s alpha coefficient =0.921 for the total instrument. The two-factor structure was loaded that jointly accounted for 60.2% of the variance.

Conclusion: The Arabic 13 item version of the PDRQ has been validated in its Arabic translation.

Key Words: Patient-Doctor relationship. Psychometric validation. Mental Illness, knowledge, Arab population.
Introduction
A cornerstone of good medical care is the relationship between the patient and his or her physician [1]. Patient satisfaction is an important component of assessing quality of care. Because the relationship between the patient and the physician provides the context in which caring and healing occur, patient satisfaction with the medical consultation is a critical core dimension of quality of care. It is quite evident [1, 2] that patient dissatisfaction is strongly correlated with non-compliance and early termination of therapy. The primary concerns of patients regarding their needs for and during the treatment can go unnoticed thus giving way opportunities for dissatisfaction [3]. Increased emphasis is being placed on patient-centered outcomes as an important step toward improving the quality of clinical care. These outcomes include physical function, psychological well-being, quality of life (QOL), and patient satisfaction [4].

Patient satisfaction with their care, is a concept that reflects the patient’s perception regarding the care quality and treatment received. Generally evaluated by self-report, several questionnaires focused on decision making [5], access and use of the different health services [6], or on the treatment satisfaction [7], have been developed in recent literature. Therapeutic alliance is crucial for the evaluation of patient-doctor satisfaction related with the development of an empathic understanding, interpersonal opening, and climate of authenticity, confidence and acceptance [1]. In order to use patient satisfaction as an outcome measure, an instrument is required that meets the criteria of being reliable, valid, and specific to, or have as, a component, physician-patient interaction applicable to an outpatient setting and tested with psychiatry patients. The principal objective was the development of a tool having an easy-to-understand use and application, that could quantify the patient-doctor relationship in the psychiatry setting. Van der Feliz-Cornelis et al. [8] developed a Patient-Doctor Relationship Questionnaire (PDRQ-9). This PDRQ is a well-known instrument for quickly measuring patient doctor relationship and has been translated into a variety of languages [8,9]. This was first introduced in 2002 which was developed for scientific and practical applications to monitor the patient-doctor relationship in general practice. This questionnaire collects some of the aspects indicated up to now, such as communication, satisfaction with the treatment and accessibility to the doctor.

The healthcare system in Qatar has gone through substantial changes and advances in recent years. These changes have affected many aspects of clinical practice, specifically the psychiatry hospital, with major emphasis on the relationship with the patients. Hence, the present study aimed to adapt the Patient-Doctor Relationship Questionnaire (PDRQ) in Arabic and study the psychometric characteristics of the Arabic version of this questionnaire in a group of adult psychiatry patients in Qatar.

Patients and Methods
Study Design
This is a cross sectional study which was conducted at the Psychiatry Hospital, Hamad Medical Corporation, Doha, Qatar. The target sample of this study included 1054 Qatari and other Arab nationals aged 18 to 65 years, who were attending the psychiatry hospital. The study was conducted during the period April 2009 to Jul 2009. The data were collected through a validated questionnaire with the help of pre-trained nurses. Qualified Nurses and Health Educators were instructed to interview and assist the patients to complete the questionnaire. We have not defined any diagnostic criteria for the patients who visited the psychiatry department, but, we have approached all the patients who were visiting the psychiatry hospital and understand the Arabic language, to understand the questions in the questionnaire. The face-to-face interview was continued until we reached the target sample size of 1054 subjects. A total of 1300 patients were approached and 1054 participated in our study, thus giving a response rate of 81.1%.

The study was approved by the Research Ethics Committee of Hamad General Hospital, Hamad Medical Corporation. All the persons who agreed to participate in this study gave their verbal informed consent prior to their inclusion in the study.

Inclusion and Exclusion Criteria
The study included only Qatari and other Arabs in the age group 18 to 65 years who gave consent and were able to understand Arabic text, as the questionnaire was in Arabic. Since the questionnaire assessed patient satisfaction with psychiatrist consultancy, we only interviewed those patients who had previous appointments with psychiatrists at the Psychiatry hospital. Patients below 18 years and above 65 years were excluded from the study. Patients coming on their first visit were not considered for
recruitment as they would not be able to describe their experience with psychiatrists. Subsequently subjects who refused to participate in our study or did not give consent or returned incomplete questionnaires were excluded from the study.

**Data Collection:**
A standard forward-backward procedure was applied to translate the English version of the PDRQ to Arabic and vice versa. The translated Arabic version of the questionnaire was checked by a bilingual consultant. The data were collected through PDRQ questionnaire with the help of pre-trained nurses. The questionnaire had two parts. The first part included the socio-demographic details of the patients and the second part the Arabic version of the 13-item PDRQ. Some of the items were “my doctor understands me”, “I trust my doctor”, “I can talk to my doctor”, My doctor helps me...etc. The scoring of the answers for the patient satisfaction range from 1 to 5 with 1 for “not at all agreeing”, 2 for “somewhat agreeing”, 3 for “agreeing”, 4 for “mostly agreeing” and 5 for “totally agreeing”.

Data was coded into a personal computer using Statistical Package of Social Sciences [10]. Internal consistency was assessed by means of Cronbach’s alpha and test-retest reliability by Intra-class Correlation Coefficient calculated by the one-way analysis of variance random effects parallel model. The internal consistency of the PDRQ questionnaire where Cronbach’s Alpha coefficient was equal to or greater than 0.70 was considered satisfactory. Mann-Whitney and Kruskal-Wallis tests were used to examine the differences between the means of two categories and three or more categories, respectively. Furthermore the factor structure of the questionnaire was extracted by performing principal component analysis using varimax rotation factor solution. The study used standard scoring method of summation of individual items and mean score of 13 items was performed.

**Ethical Consideration**
There are no potential risks to any of the subjects involved in this study. All subjects completed the self-administered questionnaire which took an average of 15 minutes to complete. Every enrolled participant was assigned a unique ID to maintain confidentiality. Personal information like name and contact details were not recorded on the questionnaire thereby making it impossible to identify the participant.

**Results**
The mean age of the studied psychiatry patients was 38.6±13.4 years with a male:female ratio, 1:1.

Table 1 (next page) shows the distribution of the psychiatry patients’ responses to questionnaire (PDRQ) with mean, variance and deviation from normality. The mean score of the patient-doctor relationship questionnaire was 3.67±0.78 and means range between 1 and 4.85. Variation from normality is almost similar across items (min 0.96 and max 1.2). Skewness values are negative for all items showing one sided skewness to the left. Negative Kurtosis shows a general tendency to a platykurtic (flatter) distribution and positive kurtosis is described as being leptokurtic (more peaked).

Table 2 (next page) shows the analysis of consistency. It was observed that correlations are mostly greater than 0.581 in items of the questionnaire showing the homogeneity. Cronbach’s alpha was 0.921 for the total instrument and it was higher than 0.911 for each of the items. The Intra-class Correlation Coefficients for the PDRQ subscales ranged from 0.581 to 0.851, indicating substantial to perfect test-retest reliability.

Table 3 (page 8) shows the factorial analysis. The principal component analysis with varimax rotation solution was performed and a two-factor structure was loaded that jointly accounted for 60.2% of the variance. Factor 1 constituted 52.22% of the variance, whereas for factor 2, it was 7.9%.

**Discussion**
To our knowledge, there is no reported Arabic adaptation of the Patient-Doctor relationship questionnaire to assess the patient-psychiatrist relationship in Qatar. This is the first study that confirmed that the Patient-Doctor relationship Questionnaire (PDRQ) is a valid and internally consistent instrument in its Arabic translation. The present study findings are almost similar to a previous Spanish study that proved that the Spanish 13 item version of the PDRQ is a valid instrument for assessing the quality of patient-doctor relation in adult patients [9].

The overall mean score of the patient doctor relationship items was 3.67, showing the better attitude of the studied psychiatry patients to Psychiatrists. Patient satisfaction with the doctor-patient visits has been shown to be an important outcome in health care. Koehler et al [11] reported that patient satisfaction measures can identify potential areas for...
Table 1: Means, variance, Skewness and kurtosis of the Arabic version of the Patient-Doctor Relationship Questionnaire

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean</th>
<th>Variance</th>
<th>Std. Deviation</th>
<th>Skewness</th>
</tr>
</thead>
<tbody>
<tr>
<td>My doctor understands me</td>
<td>3.50</td>
<td>1.745</td>
<td>1.321</td>
<td>-.404</td>
</tr>
<tr>
<td>I trust my doctor</td>
<td>3.49</td>
<td>.957</td>
<td>.978</td>
<td>-628</td>
</tr>
<tr>
<td>My doctor is dedicated to help me</td>
<td>3.95</td>
<td>1.037</td>
<td>1.018</td>
<td>-.670</td>
</tr>
<tr>
<td>I can talk to my doctor</td>
<td>3.50</td>
<td>1.213</td>
<td>1.101</td>
<td>-.516</td>
</tr>
<tr>
<td>I feel content with my doctor’s treatment</td>
<td>3.30</td>
<td>1.052</td>
<td>1.026</td>
<td>-.418</td>
</tr>
<tr>
<td>My doctor helps me</td>
<td>3.15</td>
<td>1.121</td>
<td>1.059</td>
<td>-.402</td>
</tr>
<tr>
<td>My doctor has enough time for me</td>
<td>4.00</td>
<td>1.147</td>
<td>1.071</td>
<td>-8.77</td>
</tr>
<tr>
<td>I benefit from the treatment of my doctor</td>
<td>3.80</td>
<td>1.191</td>
<td>1.091</td>
<td>-.631</td>
</tr>
<tr>
<td>My doctor and I agree on the nature of my medical symptoms</td>
<td>3.91</td>
<td>1.266</td>
<td>1.125</td>
<td>-.858</td>
</tr>
<tr>
<td>I find my doctor easily accessible</td>
<td>3.81</td>
<td>1.210</td>
<td>1.100</td>
<td>-7.12</td>
</tr>
<tr>
<td>Thanks to my doctor, I feel better</td>
<td>3.81</td>
<td>1.102</td>
<td>1.050</td>
<td>-.807</td>
</tr>
<tr>
<td>Thanks to my doctor, I gained new insight</td>
<td>3.74</td>
<td>1.148</td>
<td>1.072</td>
<td>-.764</td>
</tr>
<tr>
<td>I can handle my medical symptoms now</td>
<td>3.78</td>
<td>1.345</td>
<td>1.160</td>
<td>-.545</td>
</tr>
</tbody>
</table>

Table 2: Analysis of Internal reliability of the Arabic version of the Patient-Doctor Relationship Questionnaire: Item total and alpha if item deleted statistics

<table>
<thead>
<tr>
<th>Item</th>
<th>Corrected item – total correlation</th>
<th>Cronbach’s alpha if item is eliminated</th>
</tr>
</thead>
<tbody>
<tr>
<td>My doctor understands me</td>
<td>0.617</td>
<td>0.916</td>
</tr>
<tr>
<td>I trust my doctor</td>
<td>0.858</td>
<td>0.911</td>
</tr>
<tr>
<td>My doctor is dedicated to help me</td>
<td>0.666</td>
<td>0.915</td>
</tr>
<tr>
<td>I can talk to my doctor</td>
<td>0.677</td>
<td>0.914</td>
</tr>
<tr>
<td>I feel content with my doctor’s treatment</td>
<td>0.811</td>
<td>0.913</td>
</tr>
<tr>
<td>My doctor helps me</td>
<td>0.806</td>
<td>0.913</td>
</tr>
<tr>
<td>My doctor has enough time for me</td>
<td>0.681</td>
<td>0.914</td>
</tr>
<tr>
<td>I benefit from the treatment of my doctor</td>
<td>0.702</td>
<td>0.913</td>
</tr>
<tr>
<td>My doctor and I agree on the nature of my medical symptoms</td>
<td>0.652</td>
<td>0.915</td>
</tr>
<tr>
<td>I find my doctor easily accessible</td>
<td>0.664</td>
<td>0.914</td>
</tr>
<tr>
<td>Thanks to my doctor, I feel better</td>
<td>0.645</td>
<td>0.915</td>
</tr>
<tr>
<td>Thanks to my doctor, I gained new insight</td>
<td>0.660</td>
<td>0.915</td>
</tr>
<tr>
<td>I can handle my medical symptoms now</td>
<td>0.565</td>
<td>0.923</td>
</tr>
</tbody>
</table>

Total Cronbach’s alpha = 0.921

Table 1: Means, variance, Skewness and kurtosis of the Arabic version of the Patient-Doctor Relationship Questionnaire
Table 2: Analysis of Internal reliability of the Arabic version of the Patient-Doctor Relationship Questionnaire: Item total and alpha if item deleted statistics
improving the process of the patient-physician relationship. Hence, this validated Arabic version of Patient doctor relationship instrument made it possible to quantify the patient’s opinion regarding communication, satisfaction and accessibility in dealing with the doctor and the treatment followed. However, in practice, there is a lack of reliable and sensitive measurement instruments focused on the patient that evaluate the quality of the patient-doctor relationship in Arabic language. The adaptation of the present questionnaire is, in this sense, very appropriate, as it is an internationally validated instrument that permits us to make the comparison between different countries and makes international research possible.

The present study confirmed that the PDRQ is a valid and internally consistent instrument in Arabic translation. The internal consistency of the PDR questionnaire was supported by high Cronbach’s alpha values for the total scale and subscales; with 0.921 for the total instrument and it was higher than 0.911 for each of the items. The internal consistency refers to the extent to which the items are interrelated. Cronbach’s coefficient is one method of assessing internal consistency and is the method most widely used for this purpose. A high alpha coefficient (>0.70) suggests that the items within a dimension measures the same construct and supports the construct validity. These results are similar to the findings reported in the Spanish study [9].

It was observed in the study that correlations are mostly greater than 0.481 in the items of the questionnaire showing the homogeneity. Thus the items of the questionnaire presented good corrected homogeneity levels and, as a whole, Cronbach’s alpha value was greater than that described by Van der Feltz-Cornelis et al. [8]. Also, our two-factor solution was similar to those reported in the Spanish study [9] and a two factor structure was loaded that jointly accounted for 60.2% of the variance.

We believe that the adaptation had us obtain a reliable and easy-to-fill out questionnaire. This instrument makes it possible to evaluate the quality of the patient-doctor relationship, making it possible to obtain an important view of the group, more than partial knowledge of some of their aspects studied in the literature, such as communication levels or patient satisfaction, considering the possible variability based on age. We consider that the PDRQ questionnaire may be used as a multicultural study tool to investigate the influence of the culture in the patient-doctor relationships. This action would make it possible to access greater knowledge of the patient-doctor relationships in intercultural interaction. In addition, based on each one of its items, this instrument may be used as a measurement of qualitative analysis in daily practice, manifesting its potential use in training programs in continuing practice and education of medical personnel.

Conclusion
The study findings confirmed that the 13-item PDRQ questionnaire are reliable and valid and an internally consistent instrument in its Arabic translation.

ACKNOWLEDGEMENTS
This study was generously supported and funded by the Qatar National Research Fund- QNRF NPRP 30-6-7-38. The authors would like to thank the Hamad Medical Corporation for their support and ethical approval.

References
Table 3: Factor Analysis of the Arabic version of the Patient-Doctor Relationship Questionnaire

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor 1</th>
<th>Factor 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>My doctor is dedicated to help me</td>
<td>.801</td>
<td></td>
</tr>
<tr>
<td>My doctor helps me</td>
<td>.769</td>
<td></td>
</tr>
<tr>
<td>My doctor has enough time for me</td>
<td>.764</td>
<td></td>
</tr>
<tr>
<td>My doctor and I agree on the nature of my medical symptoms</td>
<td>.757</td>
<td></td>
</tr>
<tr>
<td>I benefit from the treatment of my doctor</td>
<td>.742</td>
<td></td>
</tr>
<tr>
<td>I feel content with my doctor’s treatment</td>
<td>.739</td>
<td></td>
</tr>
<tr>
<td>I can talk to my doctor</td>
<td>.723</td>
<td></td>
</tr>
<tr>
<td>I can handle my medical symptoms now (even if my doctor and</td>
<td>.721</td>
<td></td>
</tr>
<tr>
<td>I find my doctor easily accessible</td>
<td>.711</td>
<td></td>
</tr>
<tr>
<td>Thanks to my doctor, I feel better</td>
<td>.720</td>
<td>.608</td>
</tr>
<tr>
<td>Thanks to my doctor, I gained new insight</td>
<td>.702</td>
<td>.641</td>
</tr>
<tr>
<td>I trust my doctor</td>
<td>.670</td>
<td></td>
</tr>
<tr>
<td>My doctor understands me</td>
<td>.542</td>
<td></td>
</tr>
</tbody>
</table>


Cognitive Function in Egyptian Elderly with Chronic Kidney Diseases

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Shereen M. Mousa, MD,(1)
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Abstract

Chronic kidney disease (CKD) is associated with increased risk of cognitive impairment in community-dwelling elderly. Several studies suggest a high prevalence of cognitive impairment in CKD elderly compared to the general population.

Objective: Determine effect of CKD on cognitive functions of Egyptian elderly.

Methods: Ninety non-demented elderly, 48 male and 42 female, were included and divided into three groups, group A (30 subjects with normal serum creatinine (s.cr) and normal Blood Urea Nitrogen (BUN)), group B (30 subjects with abnormal renal functions but not yet on dialysis) and group C (30 subjects on regular thrice weekly hemodialysis for at least 6 months). All participants underwent neuropsychological assessment using Consortium to Establish a Registry for Alzheimer’s Disease Assessment Packet (CERAD).

Results: Subjects on hemodialysis and those with abnormal renal functions performed worse in most items of CERAD than those with normal renal functions. There was no statistically significant difference between the three groups regarding affection of Global cognitive function assessed by the Mini-Mental Status Examination (MMSE). High S.cr and BUN levels were associated with poor cognitive performance.

Conclusion: CKD patients either on hemodialysis or not, have poorer cognitive performance than those with normal kidney functions.

Key words: chronic kidney disease, cognitive functions

Introduction

Evaluating prevalence and risk factors for cognitive impairment in CKD is important because decreased cognitive function may compromise an individual’s quality of life, increase resources utilization, and result in suboptimal medical care (1). CKD is associated with lower mean cognitive scores across several domains of cognitive functions and lower self-reported cognitive functions. The severity of kidney disease is associated with the severity of cognitive impairment, independent of age, education and other co-morbid conditions. Moreover, several studies suggest that accelerated atherosclerosis, increased levels of homocysteine and inflammatory cytokines and anemia are playing a great role in cognitive impairment among CKD patients(2). Performance on tests of executive function and verbal memory in subjects with CKD were significantly different from the normal population suggesting that executive function may be especially affected, possibly due to disruptions in frontal-subcortical circuits(3). These executive functions play a pivotal role in a person’s ability to function independently.
Therefore, preservation of these frontal brain areas and executive functions is a major concern in aging (4).

Methods
A case-control study was conducted to assess cognitive functions in elderly with CKD disease. Ninety non-demented elderly, 48 male and 42 female, with mean age (± SD) of (68 ±9) years, were eligible for contribution. They were selected from Geriatric out-patient clinic and nephrology department, Ain-Shams University Hospital. They were divided into three groups, Group A: 30 subjects with normal serum creatinine (s.cr) and normal Blood Urea Nitrogen (BUN), Group B: 30 subjects with abnormal renal functions but not yet in need of dialysis and Group C: 30 subjects on regular thrice weekly hemodialysis for at least 6 months. Subjects with the following conditions have been excluded from all groups: Delirium, Dementia, Psychiatric illness, Cerebrovascular insults and thyroid disorders. All participants underwent neuropsychological assessment using items of the CERAD neuropsychological test battery (5) which include: Mini-Mental Status Examination (MMSE), Modified Boston Naming Test (BNT), Verbal Fluency Test (VFT), Word List Test (WLT), Drawing Test (DT), Word List Recall Test (WLRT), Word List Recognition Test (WLRET), and Drawing Recall Test (DRT). They were also assessed by Geriatric Depression Scale (GDS) - 15 items for symptoms of depression. Functional assessment was performed by Activities of Daily living (ADL) and Instrumental Activities of Daily Living (IADL). Measurement of serum creatinine (S.cr), Blood Urea Nitrogen (BUN), serum Ca (S.Ca), serum Po4 (S.Po4), and hemoglobin (Hb) level was also done.

Statistical Methodology:
Data were analyzed statistically using SPSS Statistical Package version 12. Description of all data in the form of mean and SD was done for all quantitative variables and frequency percentage was done for all qualitative variables. Comparison between quantitative variables was done using t-test to compare two groups with each other and ANOVA (Analysis of Variance) test to compare more than two groups with each other. Comparison of qualitative variables was done using chi-square test. Correlation coefficient was also done to find linear relation between different variables using Pearson correlation coefficient. Significance level was measured according to P value, P >0.05 is insignificant, P <0.05 is significant, and P <0.01 is highly significant.

Results
The study was conducted on 90 elderly (48 male and 42 female); their mean age was 68±9 years. A comparison between the 3 studied groups as regards socio-demographic characteristics is shown in Table 1. Hypertension and diabetes mellitus are the most prevalent co-morbid diseases among the studied groups. There was a statistically significant difference between studied groups regarding prevalence of hypertension and analgesic use with P-value <0.05. Hypertension was more prevalent in the normal kidney function group while analgesic use was more prevalent in the hemodialysis group. Global cognitive function assessed by MMSE as well as depression, showed no statistically significant difference among the three groups with P value >0.05 Table 2. As shown in Table 3 there was a statistically significant difference in the performance of the three studied groups as regards (VFT - DT - WLRT - WLRET) with p value <0.05. The Hemodialysis group had the worst performance in (WLRT and WLRET) while the abnormal kidney function group had the worst performance in (DT and VFT). Among the hemodialysis group, duration of dialysis was revealed to have no effect on cognitive performance. The most important risks that affect cognition were S.cr which showed a negative correlation with subject performance in (BNT - WLRT - WLRET), BUN level which showed a negative correlation with subject performance in (BNT), S.Ca level which showed a positive correlation with subject performance in (BNT), S.Po4 level which showed a negative correlation with subject performance in (BNT), and Hb level which showed a positive correlation with subject performance in (BNT - VFT - WLRT - WLRET - DRT) Table 4 (page 13).

Discussion
Prevalence of cognitive impairment and dementia in end stage renal disease (ESRD) is more than double that of the general population (6). Patients with cognitive impairment may have difficulty participating in ESRD care, such as dietary modification and medication compliance. In addition, cognitive impairment may be exacerbated during the dialysis procedure itself. Therefore, patients may not optimally benefit from educational efforts during this period (7). The current study aimed at assessing cognitive functions in CKD elderly; results demonstrated that language as measured by VFT, memory (immediate
### Table 1: Comparison between the 3 studied groups as regards socio-demographic characteristics

<table>
<thead>
<tr>
<th></th>
<th>GROUP A (No CKD) (N=30)</th>
<th>GROUP B (CKD, without dialysis) (N=30)</th>
<th>GROUP C (CKD, with dialysis) (N=30)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (years) (mean±SD)</strong></td>
<td>68±8.7</td>
<td>68±9.1</td>
<td>68±9.1</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
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<td>&gt;0.05</td>
</tr>
<tr>
<td>Male</td>
<td>16</td>
<td>16</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>14</td>
<td>14</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
<td></td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Illiterate</td>
<td>19</td>
<td>24</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Read and write</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Primary education</td>
<td>6</td>
<td>6</td>
<td>12</td>
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</tr>
<tr>
<td>Secondary education</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Higher education</td>
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<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td><strong>Smoking</strong></td>
<td></td>
<td></td>
<td></td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Non smoker</td>
<td>23</td>
<td>26</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Current smoker</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Ex smoker</td>
<td>5</td>
<td>3</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td><strong>ADL</strong></td>
<td></td>
<td></td>
<td></td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Independent</td>
<td>20 (66%)</td>
<td>22 (73%)</td>
<td>20 (66%)</td>
<td></td>
</tr>
<tr>
<td>Assisted</td>
<td>7 (23%)</td>
<td>7 (23%)</td>
<td>4 (13%)</td>
<td></td>
</tr>
<tr>
<td>Dependent</td>
<td>3 (10%)</td>
<td>1 (4%)</td>
<td>6 (21%)</td>
<td></td>
</tr>
<tr>
<td><strong>IADL</strong></td>
<td></td>
<td></td>
<td></td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Independent</td>
<td>18 (60%)</td>
<td>17 (56%)</td>
<td>20 (66%)</td>
<td></td>
</tr>
<tr>
<td>Assisted</td>
<td>5 (17%)</td>
<td>11 (36%)</td>
<td>1 (4%)</td>
<td></td>
</tr>
<tr>
<td>Dependent</td>
<td>7 (23%)</td>
<td>2 (8%)</td>
<td>9 (30%)</td>
<td></td>
</tr>
<tr>
<td><strong>Hypertension</strong></td>
<td>26 (86%)</td>
<td>18 (60%)</td>
<td>19 (63%)</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td><strong>Diabetes mellitus</strong></td>
<td>18 (60%)</td>
<td>14 (46.7)</td>
<td>15 (50%)</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td><strong>Chronic liver disease</strong></td>
<td>5 (17%)</td>
<td>3 (10%)</td>
<td>2 (6.7%)</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td><strong>Heart failure</strong></td>
<td>3 (10%)</td>
<td>4 (13.3%)</td>
<td>0 (0%)</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td><strong>Ischemic heart disease</strong></td>
<td>6 (20%)</td>
<td>11 (36.7%)</td>
<td>4 (13.3%)</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td><strong>COPD</strong></td>
<td>3 (10%)</td>
<td>5 (16.7%)</td>
<td>1 (3.3%)</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td><strong>Analgesic -Use</strong></td>
<td>0 (0%)</td>
<td>9 (30%)</td>
<td>12 (40%)</td>
<td>&lt;0.05</td>
</tr>
</tbody>
</table>

ADL = Activity of Daily Living  
IADL = Instrumental Activity of Daily Living  
COPD = Chronic Obstructive Pulmonary Disease
and delayed) as measured by WLRET and WLRT and executive functions and constructional praxis as measured by VFT and DT, are impaired in elderly with CKD. Several studies support the same issue; Kurella et.al (8) reported that patients with renal impairment have cognitive impairment mainly in verbal memory and executive functions but the latter study does not apply tests for measuring constructional praxis. Seliger et.al (9) concluded that patients with elevated serum creatinine are more likely to develop evident clinical dementia using a neuropsychological battery for assessment of memory as measured by (Wechsler test), language as measured by (modified BNT) and executive functions as measured by (Stroop Interference test, Trail making A&B and Digit-span test). Moreover, a study done by Madan et.al, (3) to assess cognitive function in patients with renal impairment showed that increasing severity of CKD is associated with progressive cognitive decline. This comes up with the negative correlation observed between S.cr levels and performance in (BNT - WLRT - WLRET ) and BUN level and performance in (BNT). Global cognitive function assessed by MMSE was not found to be affected in elderly with CKD. This finding agrees with Slinin et.al, (10) who found an independent association between mild and moderate reduction in kidney function and poor execution but not with global cognitive impairment. Though our subjects were selected not to be demented (MMSE score > 24) yet there is still no significant difference in the performance of normal kidney function elders and those with CKD. Regarding other clinical risks that associates CKD and may influence cognitive performance we observed that hypocalcemia and hyperphosphatemia were associated with poor performance in (BNT), while anemia was associated with poor performance in (BNT - VFT - WLRT - WLRET - DRT). Several studies show

<table>
<thead>
<tr>
<th></th>
<th>Group A</th>
<th>Group B</th>
<th>Group C</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMSE (mean±SD)</td>
<td>27±1.8</td>
<td>26±1.3</td>
<td>27±1.7</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>GDS (mean±SD)</td>
<td>3±1.9</td>
<td>3.5±2.4</td>
<td>4.4±3.4</td>
<td>&gt;0.05</td>
</tr>
</tbody>
</table>

**Table 2:** Shows comparison among the studied groups as regards MMSE and GDS

<table>
<thead>
<tr>
<th></th>
<th>Group A</th>
<th>Group B</th>
<th>Group C</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>BNT (Mean±SD)</td>
<td>12±1.9</td>
<td>12±2</td>
<td>10±3.5</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>VFT (Mean±SD)</td>
<td>10±4.8</td>
<td>7.9±3.9</td>
<td>8.1±3.6</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>WLT (Mean±SD)</td>
<td>17±5.9</td>
<td>15±5</td>
<td>15±7.3</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>DT (Mean±SD)</td>
<td>4.6±2.6</td>
<td>3.2±1.9</td>
<td>4.2±2.4</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>WLRT (Mean±SD)</td>
<td>5.7±2.3</td>
<td>4.9±2.5</td>
<td>3.9±2.4</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>WLRET (Mean±SD)</td>
<td>6.3±2.2</td>
<td>5.3±2.4</td>
<td>4.5±2.6</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>DRT (Mean±SD)</td>
<td>1.2±0.9</td>
<td>0.8±0.7</td>
<td>1.1±0.9</td>
<td>&gt;0.05</td>
</tr>
</tbody>
</table>

**Table 3:** Shows comparison of cognitive function Tests performance among the studied groups

BNT=Boston Naming Test
VFT=Verbal Fluency Test
WLT= Word List Test
DT=Drawing Test
WLRT= Word List Recall Test
WLRET= Word List Recognition Test
DRT= Drawing Recall Test
<table>
<thead>
<tr>
<th>Duration of dialysis in years</th>
<th>S. cr</th>
<th>BUN</th>
<th>S.Ca</th>
<th>S.Po4</th>
<th>Hb</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>r</td>
<td>p</td>
<td>r</td>
<td>p</td>
<td>r</td>
</tr>
<tr>
<td>BNT</td>
<td>-0.01</td>
<td>&gt;0.05</td>
<td>-0.36</td>
<td>&lt;0.01</td>
<td>-0.26</td>
</tr>
<tr>
<td>VFT</td>
<td>0.09</td>
<td>&gt;0.05</td>
<td>-0.16</td>
<td>&gt;0.05</td>
<td>-0.17</td>
</tr>
<tr>
<td>WLT</td>
<td>0.05</td>
<td>&gt;0.05</td>
<td>-0.04</td>
<td>&gt;0.05</td>
<td>0.005</td>
</tr>
<tr>
<td>DT</td>
<td>-0.28</td>
<td>&gt;0.05</td>
<td>0.14</td>
<td>&gt;0.05</td>
<td>0.14</td>
</tr>
<tr>
<td>WLRT</td>
<td>0.03</td>
<td>&gt;0.05</td>
<td>-0.24</td>
<td>&lt;0.05</td>
<td>-0.16</td>
</tr>
<tr>
<td>WLRE T</td>
<td>0.04</td>
<td>&gt;0.05</td>
<td>-0.27</td>
<td>&lt;0.01</td>
<td>-0.11</td>
</tr>
<tr>
<td>DRT</td>
<td>-0.21</td>
<td>&gt;0.05</td>
<td>0.05</td>
<td>&gt;0.05</td>
<td>0.08</td>
</tr>
</tbody>
</table>

BNT=Boston Naming Test  
VFT=Verbal Fluency Test  
WLT=Word List Test  
DT=Drawing Test  
WLRT=Word List Recall Test  
WLRE T=Word List Recognition Test  
DRT=Drawing Recall Test

Table 4: Correlation between cognitive test scores obtained by subjects and duration of dialysis, S.cr, BUN, S.Ca, S.Po4, and Hb level.
that anemia of CKD may cause cognitive impairment for the following reasons: Firstly, decreased hematocrit leads to decreased brain oxygen delivery, with a detrimental effect on brain metabolism. Secondly, when hematocrit decreases, cerebral blood flow increases from normal to high levels, perhaps resulting in increased delivery of uremic toxins to the brain. Thirdly, the increase in cerebral blood flow may increase intracranial pressure and therefore increase the level of brain edema (11). Likewise, low levels of calcium and high levels of phosphorous were directly correlated with cognitive deficits, mainly language, and this issue is supported by Madan study (3) which declares a negative correlation between serum calcium and P3 latency.

More studies are needed on a large scale in Egypt to detect the magnitude of cognitive impairment in CKD patients and to detect if there is a selection for some cognitive functions to be more affected than others in different stages of CKD.

References
Cognitive Impairment among Residents of Elderly Homes In Cairo, Egypt

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Fax: 00202 22418307 / 00973 17243876
Email: halasweed@yahoo.co.uk

Abstract

Background: Cognitive impairment has a great impact on quality of life of the elderly. Understanding the epidemiology of cognitive impairment in a given population is crucial for adequate planning of public health strategies. The current study was designed to assess cognitive impairment prevalence and its common determinants among residents of elderly homes in Cairo, Egypt.

Method: Residents 60 years old and over, males and females, were recruited from five geriatric homes, distributed all over Cairo. All participants were subjected to comprehensive geriatric assessment including; Cognitive function assessment using Mini-Mental Status Examination (MMSE), Depression screening using Geriatric Depression Scale-15 items (GDS15), and Functional assessment using Activities of Daily Living (ADL).

Results: The study revealed that the prevalence of cognitive impairment was 20.9% among the studied group, with highly statistically significant difference between both males (9.7%) and females (29.1%). Cognitive impairment was found to be statistically significantly correlated with gender, age and functioning but not with depression.

Conclusion: Cognitive impairment is correlated to the dependency level. Early recognition and management of cognitive impairment can improve the elderly’s independence.

Keywords: Cognitive impairment, Geriatric homes, Dependency

Introduction

Ageing is a slowly emerging phenomenon in Egypt contributing to a change in the country’s age group composition (1). With the graying of population worldwide, the percent of older people, defined as 60 years of age and more, increased from 6.1% of the total population in 1996, reaching 7.2% in 2006, and expected to be 8.9% in 2016 and 10.9% in 2026. Accordingly, the expected rate of total population growth, in Egypt, from 1996 to 2026 is about 57% while the expected rate of increase among older people during the same period is about 79 % (2).

The life expectancy for males at birth was 60.5 years in 1986 while for older people was 14.3 years. In 2026 the life expectancy for males at birth is expected be 74.7 years and for older people 19.3 years. So the percent of increase in life expectancy for males at birth from 1986 to 2026 is expected
to be 23.5% and for older people 35%. Similarly, for females at birth the percent of increase is expected to be 25% and for older females 44% (3).

As the overall number of elderly people increases together with increased life expectancy, there is a corresponding rise in the number of older persons with disabilities. Such disabilities can be social, physical, mental or psychological.

Cognitive impairment is common among older adults. Cognitive impairment not only threatens the quality of life of older people, but also has an impact on the caregivers, as well as representing challenges in different clinical care settings.

A loss of independence in activities of daily living is a key determinant of patient health-related quality of life (4) and a predictor of mortality (5).

Dementia and cognitive impairment make the strongest contribution to both the development of long-term functional dependence and decline in function (6).

A higher proportion of residents of geriatric homes with moderate cognitive impairment, experience a decline in the early and mid-loss ADLs (personal hygiene, dressing and toileting). Residents with severe cognitive impairment show the greatest decline in eating, a late-loss ADL (7).

Clinicians can reduce the occurrence of complicating factors with a proactive approach of evaluation that includes effective detection of cognitive impairment and referral for more comprehensive assessment, when indicated (8).

Understanding the epidemiology of the problem is crucial for adequate planning of health services. The aim of the current study is to assess the cognitive impairment prevalence and its common determinants in elderly homes in Cairo, Egypt.

**Methods**

**Study population:** A cross sectional study was conducted. The study was carried out in five elderly homes, located in Cairo. The homes were chosen randomly from a list, reviewed and updated by the Ministry of social affairs. Data was collected during the period between August 2008 and January 2009. Residents, males and females, 60 years old and over, were recruited for the study.

After taking approval of the administration of each place, explanation of the study aim and procedures was given to all residents with informed consent taken from each one of them and those who refused to participate were excluded from the study. Also those who refused to continue the assessment were excluded.

**Tools of assessment:**

All participants were subjected to Comprehensive Geriatric Assessment (CGA) including:

- Full medical and personal history including educational level, marital status and medical history.
- Functional assessment was done using Activities of Daily Living questionnaire (ADL) (9), whereas presence of depression was assessed using Geriatric depression scale 15 items (GDS-15) (10).

ADL questionnaire assessed the ability to carry out the basic self-care daily living tasks including: bathing, dressing, toileting, continence, feeding and transfer. Each criteria is graded according to level of dependence of the patient; either performs independently, performs with assistance, or unable to perform (0-2). A score of 0-5 indicates completely dependent, 6-9 partially dependent, and 10-12 independent.

The GDS short form (15 questions) has been derived from the 30 question version. It has been designed for screening for depressive symptomatology in elderly people excluding any questions relating to the physical symptoms of depression common in old age. Each answer indicating depression counts one point. Scores greater than 5, are indicative of probable depression.

* Mini-mental status examination (MMSE) (11) Arabic version (12), was used for assessment of cognitive function. The MMSE assesses different domains of cognitive function with a total score of 30.

The MMSE comprises: 30 questions with 10 devoted to orientation (five regarding time and five regarding place); three items requiring registration of new information (repeating three words); five questions addressing attention and calculation (mental control questions requiring patient to make five serial subtractions of 7 from 100 or spell word backwards); three recall items (remembering the three registration items): eight items assessing language skills (two naming items, repeating phrase, following a three-step command, reading and following a written command and writing a sentence); and one construction question (copying a figure consisting of two overlapping pentagons). A score less than 24/30, indicates cognitive impairment.
**Statistical Methods:**
The collected data were coded, tabulated, and statistically analyzed using SPSS program (Statistical Package for Social Sciences) software version 17.

Qualitative data was presented in form of frequency tables (number and percentage). Quantitative data was presented in form of mean ±standard.

Pearson correlation coefficient was performed to test correlation between 2 quantitative variables, while One way Analysis of Variance (ANOVA) was used to test for comparison between multiple groups with Quantitative continuous variables. Independent sample-t test was also used to compare two groups with quantitative continuous variables.

**Results**
The studied sample included 220 participants who completed the assessment, where 23 refused to participate and 16 did not complete the assessment. Among the studied group 93 were males (42.3%), and 127 females (57.7%). The mean age of the studied group was 74.4± 8.3. None of the subjects were previously assessed, by the geriatric home staff, for cognition.

The mean MMSE score was 24.14± 4.48 (8-30), with statistically significant gender difference, while the mean GDS score was 4.84±3.61 with no statistically significant gender difference (Table 1).

The prevalence of cognitive impairment was found to be 20.9%, being higher among females than males (Table 2). There was no available data about the cognitive function of those elderly on admission, as they were never assessed for cognitive function before.

The prevalence of depressed mood was 28.6% with no statistically significant gender difference (Table 2 next page).

The dependency prevalence was found to be 4.1% for the total dependence and 16.4% for partial dependence (Table 2).

Statistically significant negative correlation was found between age and MMSE score (r=-0.189, p=0.005), so the older the age, the lower the MMSE score, i.e. the more the cognitive impairment.

58.7% of the cognitively impaired were illiterate compared to 34.5% of those not cognitively impaired with statistical significance (X2 =10.470, p=0.015).

13% of the cognitively impaired were found to be totally dependent in activities of daily living (ADL) compared to only 1.7% of those not cognitively impaired. This difference was found to be statistically significant (X2 =19.604, p=0.000).

No statistically significant correlation was found between depression and cognitive impairment (X2=3.599, p=0.058).

However, it was found that the prevalence of dependency rises to 25% in presence of cognitive impairment and depression together, compared to 5.7% when having either one of them (X2=23.505, p= 0.000).

**Discussion**
All physicians who care for adults are caring for an increasingly large number of older patients. Functional impairment, cognitive and affective problems are particularly prevalent among older patients, and can be improved with early recognition and treatment.

---

**Table 1: Independent -t test for the studied group**

<table>
<thead>
<tr>
<th></th>
<th>Males (N=93)</th>
<th>Females (N=127)</th>
<th>Total group (N=220)</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>74.8 ± 8.0</td>
<td>74.0 ± 8.5</td>
<td>74.4 ± 8.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MMSE</td>
<td>25.54 ± 2.99</td>
<td>23.11 ± 5.08</td>
<td>24.14 ± 4.48</td>
<td>4.112</td>
<td>0.000</td>
</tr>
<tr>
<td>GDS</td>
<td>5.08 ± 3.64</td>
<td>4.67 ± 3.59</td>
<td>4.84 ± 3.61</td>
<td>0.823</td>
<td>0.411</td>
</tr>
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<td>Marital status:</td>
<td>Males (N=93)</td>
<td>Females (N=127)</td>
<td>Total group (N=220)</td>
<td>X²</td>
<td>P</td>
</tr>
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<td>--------------</td>
<td>-----------------</td>
<td>---------------------</td>
<td>----</td>
<td>---------</td>
</tr>
<tr>
<td>Married</td>
<td>8 8.6%</td>
<td>1 0.8%</td>
<td>9 4.1%</td>
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</tr>
<tr>
<td>Divorced</td>
<td>31 33.3%</td>
<td>15 11.8%</td>
<td>46 20.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Widow</td>
<td>40 43%</td>
<td>82 64.6%</td>
<td>122 55.5%</td>
<td>26.1</td>
<td>0.000</td>
</tr>
<tr>
<td>Single</td>
<td>14 15.1%</td>
<td>29 22.8%</td>
<td>43 19.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>0 0%</td>
<td>87 68.5%</td>
<td>87 39.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R &amp; W</td>
<td>19 20.4%</td>
<td>17 13.4%</td>
<td>36 16.4%</td>
<td>111.42</td>
<td>0.000</td>
</tr>
<tr>
<td>High School</td>
<td>48 51.6%</td>
<td>14 11%</td>
<td>62 28.2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>College</td>
<td>26 28%</td>
<td>9 7.1%</td>
<td>35 15.9%</td>
<td></td>
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<tr>
<td>ADL:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Independent</td>
<td>76 81.7%</td>
<td>99 78%</td>
<td>175 79.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partially dependent</td>
<td>15 16.1%</td>
<td>21 16.5%</td>
<td>36 16.4%</td>
<td>1.58</td>
<td>0.453</td>
</tr>
<tr>
<td>Totally dependent</td>
<td>2 2.2%</td>
<td>7 5.5%</td>
<td>9 4.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitively impaired</td>
<td>9 9.7%</td>
<td>37 29.1%</td>
<td>46 20.9%</td>
<td>12.29</td>
<td>0.000</td>
</tr>
<tr>
<td>Depressed</td>
<td>31 33.3%</td>
<td>32 25.2%</td>
<td>63 28.6%</td>
<td>1.74</td>
<td>0.187</td>
</tr>
</tbody>
</table>

Table 2: Chi-square testing of collected data of the studied group
Cognitive impairment is associated with increased risk for disability, increased health care costs, and progression to dementia (13).

The adoption of preventive strategies and rational allocation of resources to lessen the impact of dementia depend mostly on knowing the prevalence of cognitive impairment and the relative importance of its determinants (14).

The degree of cognitive impairment of elderly people in a long term facility should influence the type of care required to minimize functional problems.

In this study, the prevalence of cognitive impairment, among residents of elderly homes in Cairo, was assessed.

The Mini-Mental State Examination was used as a tool for screening for cognitive impairment. Mini Mental Status Examination (MMSE) is the most widely used short cognitive test in clinical practice, research, and epidemiological studies (15). It is considered the most commonly administered psychometric screening assessment of cognitive functioning.

Several studies had been conducted to assess the prevalence of cognitive impairment among elderly in nursing homes with a wide range of results. Variations in findings could be explained by differences in study methodology, including diagnostic criteria, and also to the varying admission criteria to different types of care in different areas (16).

The prevalence of cognitive impairment, in the current study was found to be 20.9%. Not being nursing homes, these elderly care homes were admitting elderly who have a considerable degree of independency. That could explain the result of having 79.5% of the studied group independent in ADL with only 4.1% totally dependent. And that could also explain why the prevalence of cognitive impairment is less than in some other studies.

A study was conducted to assess the prevalence of cognitive impairment among nursing home residents in Taipei, Taiwan. 50.9% were found to fit criteria of cognitive impairment and 47.7% had both impaired cognition and impaired performance in activities of daily living (17).

Another study was conducted among elderly Mexicans living in nursing homes. The participants were drawn from a random sample of 451 elderly, aged 60-104 years. Measurements included the Spanish versions of MMSE, ADL index, and the Geriatric Depression Screening; demographic factors were obtained. The results revealed that the prevalence of cognitive impairment was 52.3% (18).

Whereas in a study in Malaysia, the prevalence of cognitive impairment in an Elderly care home was 36.5% (19).

In common with other studies, cognitive impairment was found to be more prevalent among women, and increased with age.

Rait et al., (2005), also found cognitive impairment to increase with age and to be higher in women, with the highest prevalence in women aged 90 years and above (20).

Cognitive impairment was found to be related to educational level, ADL, but not to depression. Arias-Merino et al., (2003) found cognitive impairment to be significantly related to gender, educational level, activity participation, pension, ADL, and depression (18).

Diniz et al., (2007) also suggested a strong influence of education in the cognitive state of elderly (21).

Although, late onset depression and cognitive impairment often occur together, suggesting a close association between them (22, 23). This was not the case in the current study.

Some studies found that depression is a risk factor for the development of cognitive decline (24, 25), whereas others could not confirm this finding (26, 27).


Vinkers et al., (2004) found that cognitive impairment at baseline was associated with an accelerated increase of depressive symptoms, whereas depressive symptoms at baseline were not related to an accelerated cognitive decline. Cognitive impairment preceded the onset of depressive symptoms but not vice versa (29).

The awareness of cognitive decline may cause depression as a psychological reaction to the loss of cognitive functioning. Indeed, memory complaints in old age may be an early sign of dementia and, as such, upset elderly people (30).

However, in another prospective population based study, global cognitive function and episodic memory at baseline were not associated with the course of depressive symptoms during the follow-up (31).
Yue et al., (2010) also found that depression was not directly correlated with cognitive impairment in Chinese nonagenarians and centenarians (32).

Functional change is influenced by severity of cognitive impairment: those with moderate severity showing a more linear decline (33).

Ang et al., (2006) also found cognitive impairment to be a significant risk factor for functional decline (34).

Poor physical function and muscle strength was found to coexist with cognitive impairment, independent of muscle mass. It is likely therefore that the functional decline in dementia might be related directly to factors resulting in cognitive impairment independently of the coexisting sarcopenia (35).

In spite of not finding significant correlation between cognitive impairment and depression in the current study, the coexistence both was found to be associated with greater risk for functional dependency.

Mehta et al., (2002), also found that the addition of cognitive impairment to the depressive symptoms demonstrated a higher risk for functional dependence with ADLs (36).

Although this study did not use in-depth measures of cognitive impairment, depression and dependency, it did enable the frequency of such disorders to be estimated.

Conclusion
Elderly persons must be assessed for cognitive impairment and depression before residing in a geriatric home and must be followed regularly thereafter.

Improving the cognitive state together with the mood, can improve the functional state and thus improve the quality of life.

References
Spot light on Alzheimer’s disease in the north of Lebanon

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Abstract

Introduction: Alzheimer’s disease (AD) is believed worldwide to be one of the major diseases among the elderly. Yet, during the course of our investigation we found no comprehensive data regarding this issue, nationwide and especially in the northern region of Lebanon (NRL). In this article, we are aiming to spot the light on the prevalence of AD in the NRL particularly in Tripoli, as well as investigating the most influencing risk factors involved in causing and promoting the disease in this area.

Methodology: for studying the prevalence of AD as well as the risk factors, a Pilot survey was specifically designed, requesting basic information including social and health factors. 180 questionnaires were distributed in the NRL, and 165 were collected. The survey was distributed randomly and in health institutes and home care.

Results: The data was then processed and statistically analyzed using Microsoft Excel program. AD is present in the north of Lebanon in Tripoli, in a substantial ratio among elderly above 50’s (12%), a percentage that has nearly doubled among the female population (22% female and 10% male). Social environmental and health factors have played a very obvious role in promoting Alzheimer’s disease in this region.

Conclusion: Although this is a pilot study, it has demonstrated the presence of AD in this region. Meanwhile, a very small, almost negligible, effort is being exerted in order to elevate the problem. In fact there is little proper public knowledge of the disease, which might have contributed to the proliferation of the disease, as many avoidable risk factors have not been pointed out. However, it was noticed that, the major obstacle in dealing with AD was not having an easy tool for early diagnosis, which needs to be well addressed and well studied in future research.
Background

Tomorrow’s elderly are today’s adults and yesterday’s children(1). There is no doubt that the elderly are guardians of the collective memory, conservers of inter-generational relationships and transmitters of authentic values(2). They are and are sources of inspiration that define the texture of the fabric of society; a vast resource of knowledge, experiences and insights that should be cherished by all of us(3). After all, we all admit that elderly people are the backbone of modern society(4). And since the best classroom is at the feet of an elderly person(5), it is important that elderly people are not seen as a burden on society, but rather as an asset(1). Their wisdom and experience have to be fully utilized.

On the other hand, it is becoming clear day after day that the ratio of elderly among the population is increasing continuously. According to the statistics, today there are more than six hundred million people who are over sixty years of age (6,7).

According to the World Health Organization, by 2025 there will be more than 800 million people worldwide over 65 years, while in Lebanon, in 2006 the number of people aged 60 years and above was 11.1%(8). This is a clear indication of the ascending ratio of elderly in Lebanon, which requires more attention from different prospects including the health and the well-being of the elderly. Dementia, especially Alzheimer’s (AD), represents one of the serious illnesses that might target the elderly.

AD, as a neurodegenerative brain disease, is the most common cause of dementia (9) accounting for between 70% to over 90% of all cases(10), and its prevalence is expected to quadruple by the year 2047 in the United States(11) characterized by Cerebral plaques laden with b-amyloid peptide (Ab) and dystrophic neuritis in neocortical terminal fields as well as prominent neurofibrillary tangles in medial temporal-lobe structures(12). Millions of people are already affected by Alzheimer’s disease. Nowadays this disease takes a devastating toll, not only on the patients, but also on those who love and care for them. Whether it afflicts a neighbor who quietly fades behind the upstairs curtains, a relative who no longer comes to visit during the holidays, or a former president, the effects of AD are drawing closer to each of us every day. Even more, AD could lead to a deterioration of memory and other cognitive domains that leads to death within 3 to 9 years after diagnosis(7).

More than 35 million people worldwide, and 5.5 million in the United States have Alzheimer’s disease(12). As the aging population increases, the prevalence will approach 13.2 to 16.0 million cases in the United States by mid-century. According to the Alzheimer’s Association 1 in 8 elderly will be suffering from AD, and almost every 71 seconds in U.S someone will develop Alzheimer(13). Coming to the Middle East, there are 1.5 million cases in the Arab World and 30,000 cases of Alzheimer’s in Lebanon have been reported which shows that figures are staggering enough for a quick and effective action(14).

As part of our aims and policies at the MSRC, which includes finding the solution for the health problems in our society, we have established a research group that focuses mainly on elderly well-being including AD, starting from North Lebanon. This group has conducted a pilot survey on the prevalence of AD and some of the well known risk factors in this area, while further studies will deal with more factors and other domains related to AD. Part of our work has been presented during the MECAA Middle East Congress on Age, Aging and Alzheimers.

Today a lot of research is currently going on to uncover the main cause(s)(15); also exploring potential treatments for symptoms, such as correcting the chemical imbalances or even lifestyle. We are aiming from our study to draw attention to the description of the disorder and its causes in the area of North Lebanon, and hoping to pave the path for further future research that can help to come up with recommendations to reduce the risk of this disease.

Methodology

Based on the introduction and previous studies, we concluded that it is important to conduct a study on the epidemic spread of Alzheimer’s disease and its impact in the region of northern Lebanon and we aim to focus on all the causes and risk factors that could contribute to its development. For this reason, we followed the following procedures to conduct such studies:

- A specific questionnaire was designed, requesting information on the various factors and causes that might contribute to accelerate Alzheimer’s disease, based on previous work.
- 180 questionnaires were distributed in the northern region of Lebanon, especially Tripoli.
- They were distributed among the citizens, health care institutions such as hospitals, pharmacies, and clinics.
These questionnaires were distributed and collected continuously during the period of three months from early March until late June 2010.

The questionnaire was simple, straightforward and understandable so that everyone could answer easily. The majority of questions can be answered easily by yes or no, and a few questions needed minimal explanation but they were easily resolved. Also it should be noted that these questionnaires were presented in Arabic (the mother tongue).

Out of 180 questionnaires, 165 were returned and accepted. This may be due to the lack of public awareness about the disorder and its effect on society. Few women and men refused to complete the questionnaires, even if the privacy of the individual was well preserved; no names or other personal information were included in the questionnaire. In some other questionnaires we found conflicting answers during the resolution of the results, thus they were eliminated.

The questionnaire was divided into three parts:

**First part:** Personal information:
This section contained personal information like age, height, weight, social status, place of residence, and nature of work, educational and economic level.

**Second part:** General Information:
This section contained more specific questions about healthy living, like the consumption of coffee and alcohol, supplements of minerals and vitamins and iron, as well as physical activity. As well as about the presence of any other disorders such as cholesterol, heart disease, stroke, hypertension, or any other chronic disease, as well as the chronic exposure to certain chemicals or stress factors and taking any antidepressants following depression, endocrine problems or taking any hormone-replacement therapy, taking fish oil tablets and the average monthly fish plates in addition to the general diet.

**Third part:** Alzheimer’s disease:
In this part, the questions were directed to the Alzheimer’s patients emphasizing the starting age of the disease, treatment and prevention methods, as well as information related to the symptoms like memory impairment, psychosis, agitation, deterioration of language and any abnormalities which are uncommon until the late phases of the disease, in addition to any family history (genetic causes) or cases of Down’s syndrome.

**Results**
20 individuals of the sample of 165 collected were diagnosed and classified as Alzheimer’s patients (12%).

The AD patients were not equally distributed among different age categories; the incidence increases steadily with age, which is presented in Figure 2. (next page)

AD also has shown variation between the two genders: females were twice as vulnerable as males.
Alzheimer’s was not evenly distributed among different regions in the area.

Figure 2: AD distribution among age categories

Figure 3: AD according to gender
Table 1: Regional distribution of the sample

<table>
<thead>
<tr>
<th>Region</th>
<th>% of Alzheimer's</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kebbeh</td>
<td>4</td>
</tr>
<tr>
<td>El Tall</td>
<td>8</td>
</tr>
<tr>
<td>Abu Samra</td>
<td>9</td>
</tr>
<tr>
<td>Mina</td>
<td>9</td>
</tr>
<tr>
<td>Azmi</td>
<td>27</td>
</tr>
<tr>
<td>Others</td>
<td>20</td>
</tr>
</tbody>
</table>

AD in relation to socioeconomic status:

Figure 4: Distribution of sample according to social status

* others includes divorced and widowed.

Figure 4: Distribution of sample according to social status
Environmental factors and life style influence on AD:
The various factors that influence the existence of the progression of Alzheimer’s in Northern Lebanon were studied in our questionnaire and the results are displayed in the following Figures:

Figure 5: incidence of AD in relation to educational level

Figure 6: Relationship between the ALZ and economical status
Figure 7: Relation between AD and type of work

Figure 8: Relationship between physical activity and Alzheimer's

Table 2: Relationship between Smoking and Alzheimer's
**Table 3: Relationship between Alzheimer’s and alcohol**

<table>
<thead>
<tr>
<th>Alcohol</th>
<th>Normal</th>
<th>Alzheimer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Not</td>
<td>137</td>
<td>20</td>
</tr>
</tbody>
</table>

**Figure 9: Relationship between Coffee and Alzheimer’s**

Discussion

Despite the small number of our sample (165 people), due to the limited time from the beginning of March until the end of June 2010, this project has obviously highlighted Alzheimer’s disease in North Lebanon - Tripoli, and it has incurred significant situations, that must be developed into new scientific research in the future.

Before discussing the results, it should be noted that various points have negatively impacted on our research. The most important one was the difficulty of communication with patients and caregivers themselves (parents, nurses, health centers). This has led to inconsistencies in the answers in many cases, which forced us to reduce a large number of investigations. Moreover, concerning AD patients, we visited centers of elderly care, which has limited the possibility of obtaining a significant proportion of patients.

Using the results obtained, we found that 12% of the total population (aged over 50 years) are afflicted with Alzheimer’s disease which is in coordination with studies in developed countries. So the disease is present in our study area and should be followed directly by new techniques, or even research in the field of treatment or prevention and even diagnostics. In addition, we can consider that lack of public awareness to the nature of the disease, its severity and methods of treatment are among the factors contributing to the spread of the disease.

When comparing our results with numerous national publications, one notices that they are compatible particularly in studying the two factors relating to sex and age(7). (continued page 33)
Figure 10: Relationship between Omega 3 consumption (either by eating fish or supplements) and Alzheimer’s

Figure 11: Relation between consumption of apples and curry and Alzheimer’s
Our results show that the frequency of the disease AD is increased in patients who do not practice mental activity (at least 3 hours per week).

Regarding the relation between Alzheimer’s and the exposure to chemicals (or electrical and magnetic fields, gold and drug intoxication) no variation was noticed.

People’s knowledge about the disease’s existence and its frequency in the region was also investigated.
Figure 14
Also people contacting existing concerned associations was investigated with only 4% having made any kind of contact with such an organization.
Many studies have classified Alzheimer’s disease as a disease of genetic origin(51,52). Thus we investigated this issue and the results are shown in Figure 15. Meanwhile no relation was found between Mongolians cases (Down’s syndrome) in the family and Alzheimer’s disease.

Figure 15: Relationship between Alzheimer’s and family history
Alzheimer and individuals health:
No concrete relation was found between Alzheimer’s and olfactory sensory disorders.

<table>
<thead>
<tr>
<th>Alzheimer’s and other diseases</th>
<th>% of normal</th>
<th>% AD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes</td>
<td>29</td>
<td>20</td>
</tr>
<tr>
<td>Heart problems</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Anemia</td>
<td>39</td>
<td>40</td>
</tr>
<tr>
<td>Vitamin deficiency</td>
<td>27</td>
<td>30</td>
</tr>
<tr>
<td>Glandular problems</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Brain problems</td>
<td>11</td>
<td>15</td>
</tr>
<tr>
<td>Depression</td>
<td>24</td>
<td>26</td>
</tr>
</tbody>
</table>

Table 4: Distribution of various diseases among normal and AD patients

Figure 16: Comparison of the value of BMI between the normal population and subjects with Alzheimer’s
Figure 17: the most common symptoms connected to AD

According to our investigation only 50% of the AD patients were receiving medication and out of these only 10% were benefiting (Figure 18 - next spread).

Until now the spread of the disease increases remarkably with age, reaching a percentage of 17% and 33% in subjects aged over 50 years and 80 years respectively. These results are acceptable because this disease is due to several factors that accumulate with age.

The percentage with Alzheimer’s disease among women is twice as much as that in men, which could be due to various reasons, such as:

- The level of education among elderly women was very modest, probably due to cultural background. However, one should expect that the factor is diminishing due to the increasing education among women.
- As our project has shown, as well as others, the disease spreads more among less active (unemployed) people.
- Since most of our female sample where involved in mainly routine rather than intellectual activities (house wife), this might pose a real factor for increasing the ratio of AD among females!
- Still the old proposed theory of higher average life span among women could be a major factor.

Our studies of the social status have demonstrated that people without partners or close family members especially those who have a traumatic social life (divorced and widowed) are more vulnerable to the disease (Figure 4).

The results could imply that inhabitants of wealthy areas are more vulnerable to AD (Table 1). However, one should note that most of our AD patients were in private elderly house care, which might not be affordable by people with low incomes, thus by no means should we conclude that this is a rich person’s disease.

Other daily factors were studied with fluctuating effect. Some have promoted the disease such as lack of continuous exercises (Figure 8) or brain stimulating activities (Figure 13) which was not totally surprising. On the other hand drinking coffee (Figure 9) or eating fish or supplement of Omega3 (Figure 10) green apple (Figure 11) or curry spices (Figure11) have all shown a considerable effect on reducing the vulnerability. However no real conclusion could be made about drinking alcohol, since the majority of our sample, due to cultural background, were non
alcohol drinkers (Table 3). But surprisingly, smoking has been shown to reduce the incidence of AD (Table 2), where it is in accordance with a recent study, conducted on animals showing that nicotine stimulates acetylcholine receptors that are involved in memory and learning (53,54).

No clear relation was found between the various diseases considered and the incidence of AD (Table 4) including diabetes and cardiac disorders or even depression. But genetic predisposition has clearly played a major role (Figure 15). AD patients tend to be slimmer which might be due to lack of appetite and appropriate care that is given to patient (Figure 16).

Also no clear relationship was found between the disease and the exposure of the patient to chemicals, gold or drug intoxication (Figure 12).

Surprisingly only about 50% of the AD patients studied were receiving any kind of treatment, although most of them where in a private elderly house care institute. Out of those who were treated only 10% were showing any benefit (Figure 18), which makes us wonder about the role of the institutes and the availability of the medication for the public as well as the type of treatment and medication used.

In conclusion, AD is clearly present in this region and needs to be dealt with more firmly. Genetic predispositions play a major role in its existence, but other factors do influence the promotion of the disease in the area, such as social, mental and physical activities as well as the nutritional state of the individual. However, a wider (larger sample) and deeper research (studying each of these factors in depth) should be conducted to confirm these conclusions.

However, other issues need to be addressed like type of treatment and medications used, as well as raising the issue for private and governmental institutes to have better trained staff as well as making treatment affordable to wider and less wealthy group of individuals.

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Figure 18: This Figure shows the percentage of patients who received treatment, as well as those who benefited from such treatment.

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