# Education effects on cognitive function in a healthy aged Arab population

**Rivka Inzelberg, MD**[1,2], **Edna Schechtman, PhD**[3], **Amin Abuful, BSc**[1], **Magda Masarwa, MD**[1], **Aziz Mazarib, MD**[4], **Rosa Strugatsky, MD**[1], **Lindsay A. Farrer, Ph.D**[5], **Robert C. Green, MD, MPH**[5], and **Robert P. Friedland, MD**[6]

[1]Department of Neurology, Hillel Yaffe Medical Center, Hadera, Israel

[2]Rappaport Faculty of Medicine, Technion, Haifa, Israel

[3]Department of Industrial Engineering, Ben Gurion University, Israel

[4]Department of Neurology, Ziv Medical Center, Zfat, Israel

[5]Departments of Medicine (Genetics Program), Neurology, Genetics & Genomics, Epidemiology, and Biostatistics, Boston University Schools of Medicine and Public Health, Boston, Massachusetts, USA

[6]Laboratory of Neurogeriatrics, Department of Neurology, Case Western Reserve University, School of Medicine, Cleveland, Ohio, USA

## Abstract

**Background**—The Minimental State Examination (MMSE) has not been validated in Arabic speaking populations. The Brookdale Cognitive Screening Test (BCST) has been developed for use in low schooling populations. We investigated the influence of gender, education and occupation in a cognitively normal community sample assessed with an Arabic translation of the MMSE and the BCST.

**Methods**—Cognitively normal subjects (n=266, 59.4 % males, mean age (SD): 72.4 (5.5) years) from an Arab community in northern Israel (Wadi Ara) were evaluated. Education was categorized into levels: 1=0–4 years, 2=5–8 years, 3=9–12 years. Effects of gender, education and occupation on MMSE and BCST were analyzed by ANOVA, taking age as a covariate.

**Results**—The mean MMSE score of males [26.3 (4.1)] was higher than that of females [23.6 (4.2) points]. Two-way ANOVA showed a significant interaction between gender and education on MMSE (p=0.0017) and BCST scores (p=0.0002). The effect of gender on MMSE and BCST

was significant in education level 1 (p<0.0001, both tests) and level 2 (p<0.05, both tests). For education level 1, MMSE and BCST scores were higher for males, while both scores were higher for females in education level 2. The effect of occupation was not significant for both genders.

**Conclusion—**Education and gender influence performance on the Arabic translation of the MMSE and BCST in cognitively normal elderly. Cognitively normal females with 0–4 years of education score lower than males. These results should be taken into consideration in the daily use of these instruments in Arabic.

### Keywords

Minimental state examination; MMSE; cognitive; Arabic; elderly; gender; education

## Introduction

Dementia is a major health problem worldwide because of the fast-growing elderly population. The validation of appropriate assessment instruments is an important starting point for ensuring adequate delivery of health care to older people (Rait et al; 1996). These instruments should be reliable, valid, sensitive and specific for dementia, culturally and linguistically appropriate to the population, usable with illiterate subjects, and comparable in reference to western populations. Besides age, demographic variables including educational levels are influential (Li et al. 1991; Chandra et al., 2001; Hendrie et al., 2001). Despite the known flaws of the Minimental State Examination's (MMSE) (Folstein et al., 1975; Teng and Chui, 1987; Tombaugh and McIntyre, 1992), it remains the most widely used brief cognitive test in clinical practice, clinical research, and epidemiological studies (Bleecker et al., 1988; Bravo and Hebert, 1997).

To our knowledge, a validated Arabic translation of the MMSE has not yet been published. A major challenge to studying cognitive function in Arabic populations, is the need for dementia screening instruments that were in Arabic, culturally appropriate, suitable for testing individuals with different schooling levels, and comparable to the tests being used in the reference western population.

The aim of this study is to describe the distribution of MMSE scores obtained using the Arabic translation in cognitively normal elderly subjects for different education levels in both genders, and to compare MMSE performance with data from the Brookdale Cognitive Screening Test (BCST), developed in Israel for use in populations with high illiteracy rates (Davies, 1987) and includes items on orientation, language, memory, attention, naming, abstraction, concept formation, attention, praxis, calculation, right left orientation, and visuospatial orientation.

## Methods

### Study population

Wadi Ara (the Ara Valley located in northern Israel) has a population of 81,400 Arab inhabitants of whom 51% are men. The elderly cohort ( 65 years) included 2067 residents (2.5 %) on prevalence day (January 1st, 2003), according to the Israel Central Statistics Bureau. Between January 2003 and June 2005, we systematically approached a subset of 442 elderly subjects living in consecutive houses. The present study reports the results of cognitively normal elderly subjects.

The study was performed under the approval of the Helsinki Committee of the Hillel Yaffe Medical Center, the Israel Ministry of Health and was reviewed by the Institutional Review Boards of University Hospitals of Cleveland, Case Western Reserve University and Boston

University. All participants signed a written consent form in Arabic. In case a subject was illiterate, the interviewer read aloud the consent form to the subject, who then signed by fingerprint of the first digit of the right hand.

### Subject evaluation

This work is part of an epidemiological study of brain aging-related disorders in Wadi Ara. All subjects are evaluated for cardiovascular risk factors, involving questionnaires concerning activities of daily living, life-style and cognitive function. All participants were examined in their homes by a team including neurologist, a social worker and an academic nurse, all of whom were native Arabic speakers. Elderly subjects in Wadi Ara never reside alone; they live either with their spouse or in one child's home. None were institutionalized. All subjects were first approached by the nurse. An interview with a relative who knows the subject well (in general the spouse or a child) captured information about medical and family history, medication use and activities of daily living. The informant interview also ascertained history of changes in behavior, cognitive abilities, and performance of daily living, occupational and recreational activities. In a second visit, the neurologist performed a complete neurological examination and the motor part of the Unified Parkinson's Disease Scale (UPDRS) of all subjects. Subjects who demonstrated impairment were further evaluated by the Hamilton Depression Score, Geriatric Daily Activities Score. Four neurologists reviewed the results in a bi-monthly consensus conference and in the case of those subjects who were impaired, generated a consensus diagnosis.

A subject was defined as cognitively normal if there were no complaints about memory impairment or any other cognitive domain and no evidence of such disturbance according to surrogates or neurological examination, and no evidence of impairment in the activities of daily living stemming from cognitive disturbances.

### Cognitive evaluation instruments

Arabic translations of the MMSE (maximum score=30) and Brookdale Cognitive Screening Test (BCST, maximum score=24) were used. The BCST was developed at the Brookdale Institute of Gerontology, Jerusalem for use in populations with high illiteracy rates (Davies, 1987). Questionnaires about occupation focused on both present and past working activities. Occupation-type was categorized for statistical analysis purposes as follows: 1=never worked outside the house, or housewife, 2=handy work (trader in shop, cook, carpenter, builder, etc), 3=agriculture, 4=office (secretary, accountant, post office worker, teacher). Since MMSE involves a task that uses a word, a task for writing a sentence and reading, these items scored 0 in subjects with 0 years of schooling.

### Statistical analysis

Statistical analyses were performed using SAS (Statistical Analysis Software). Education level was treated as an ordinal variable by grouping the subjects by years of formal schooling, in accordance with previous studies on MMSE (Crum et al., 1993) as follows: 1=0–4 years, 2=5–8 years, 3=>8 years. Since only 4 subjects had >12 years of education, we defined education level 3 as 9–12 years and calculated the means of MMSE and BSCT at education level 3 accordingly. Proportions of subjects within different education levels by gender were compared by chi-square test for independence.

The means of MMSE and BCST scores for each gender and level of education were compared by Analysis of Covariance, treating age as a covariate. When a significant interaction between education and gender was found, the difference between scores of males and females within a given education level were compared by Student's t-test. Correlation between MMSE and BCST scores was analyzed by Spearman correlation.

Differences between MMSE and BCST scores for different occupations and genders were analyzed by ANOVA. Means of MMSE and BCST scores of different occupation types and education levels were compared separately for males and females by Student's t-test. We corrected alpha for multiple comparisons (Bonferroni) to 0.05/4= 0.0125.

## Results

Of the 442 subjects that were approached, 438 agreed to participate in the study (refusal rate 0.9 %). Four were excluded due to severe systemic non-neurological disease. Two hundred sixty-six subjects were cognitively normal and these subjects constituted the study group. There were 158 males (59.4 %) and 108 females (40.6 %).

### Effect of age

The mean age of the cohort was 72.4 (5.5). The mean age (SD) of males was 72.8 (5.6) years and of females 71.6 (5.4) years (not significantly different, p>0.1). Regression analysis showed that age significantly affected MMSE ($R^2$=0.03, p=0.003) and BCST ($R^2$=0.03, p=0.004) scores. We found a significant effect of age on MMSE for males [F=12.98, d.f. (1, 152), p=0.0004) but not for females [F=0.96, d.f.(1,104), p>0.1]. A similar finding was observed for the BCST for males [F=12.73, (d.f. (1,152), p=0.0005), but not for females [F=0.52, d.f. (1,104), p>0.1).

### Effect of gender and education

The mean MMSE score of the population was 25.2 (4.4), 26.3 (4.1) for males; 23.6 (4.2) for females, p<0.0001 (compared to males). The mean BCST score of the population was 19.1 (4.2), 20.3 (3.8) for males, 17.3 (4.0) for females (p<0.0001).

The mean number of school years was 4.0 (3.6) years (range 0–20 years). The distribution of education levels for each gender was as follows: education level 1= 46 % of males (n=72), 84 % of females (n=90); level 2 = 40 % of males (n=62), 15 % of females (n=17), level 3= 12 % of males (n=18), 0.1 % of females (n=1). The proportions of males and females for each education level significantly differed ($\chi^2$=39.95, d.f 2, p<0.0001).

Since MMSE and BCST were significantly influenced by age, we used age as covariate. Two-way ANCOVA taking age as covariate showed a significant interaction between gender and education for MMSE (F=6.51, d.f. (2, 258), p=0.0017, Fig 2) and Brookdale scores (F=8.75, d.f. (2,258), p=0.0002). The difference between mean MMSE for males and females (Table 1, Fig 1) was significant in education level 1 [males 25.0 (4.8), females 22.5 (3.8); F=16.83, d.f. (1,159), p<0.0001] and education level 2 [males 27.2 (3.0), females 28.9 (1.4); F=4.77, d.f. (1,159), p=0.032]. A similar result was observed (Table 1, Fig. 1) for BCST scores at education level 1 [males 19.2 (4.5), females 16.2 (3.5; F=26.15, d.f. 1, p<0.0001] and level 2 [males 20.9 (3.1), females 22.5 (1.7); F=4.55, d.f. 1, p=0.036).

Both MMSE and BCST scores of females were lower than those of males in education level 1, but were significantly higher than those of males in education level 2, hence the significant interaction. The significant interaction between education and gender is a reflection of the lower mean MMSE and BCST scores of one gender than those of the other gender in education level 1, but the order is reversed in education level 2 (Fig 1). There were not enough females at education level 3.

### Effect of gender and occupation

The distribution of occupational categories within each educational level for each gender is shown in Table 2. Data on occupation was missing for 19 subjects. ANOVA revealed a

significant interaction between occupation and gender for MMSE scores (F=3.84, d.f. (3,238), p=0.013) and BCST scores (F=3.57, d.f. (3,238), p=0.015). We therefore compared the mean MMSE and BCST scores between occupations separately for males and females. Since occupation types and education levels are interrelated, we added education level to our model; hence we used a two-way ANOVA to compare the means of MMSE and BCST scores of different occupations within each education level, separately for males and females. There were only two males who did not work and only one female in office work. We therefore excluded these subjects from the analysis.

Two way ANOVA with the two factors: education and occupation types showed that for males, MMSE scores were significantly different for different education levels (F=4.12, d.f. (1,118), p=0.048). The effect of occupation was not significant. BCST scores were not significantly different between education and occupation groups (Table 3). For females, mean MMSE scores [F=18.65, d.f. (1,89), p<0.0001] and BCST scores [F=21.51, d.f. (1,89), p<0.0001] were significantly different between education levels, but not for occupation.

### Correlation between MMSE and BCST

There was a highly significant correlation between MMSE and Brookdale scores in the entire group (r=0.852, p<0.0001). This correlation was of the same magnitude for both genders (men: r=0.8223, women: r=0.854, p<0.0001, both). The mean MMSE score of males was 26.3 (4.2) and of females 23.6 (4.2) points (Table 1). The mean BCST scores of males was 20.3 (3.8) and of females 17.3 (4.0), (Table 1).

## Discussion

We describe normative data for of the Arabic translation of the MMSE and of the BCST. Mean values of the MMSE scores were comparable to population-based norms described for MMSE in English in the USA at all correspondent education levels (Table 1), (Crum et al., 1993).

We observed a divergent effect of gender in different education levels. Our results showed that at low schooling (<=4 years) females perform significantly worse than males. However, with education of more than 4 years, females perform significantly better than males. A possible explanation could be that in the studied generation, girls who were intellectually privileged were provided the possibility for more education years, while boys had the opportunity to study routinely. This might have generated selection bias for women in the higher education level group.

To our knowledge, a validated Arabic translation of the MMSE has not yet been published. Al-Rajeh et al used a modified version of the MMSE in Arabic in a group of 37 subjects (cognitively preserved and demented), (Al-Rajeh et al., 1999) and found that females had significantly lower scores than males, suggesting a possible effect of limited education in females. Reading levels show highest correlation with MMSE scores, even more prominently than education (Weiss et al. 1995). In that study, only a small proportion of the subjects had zero reading level, while in our population the majority of females were illiterate.

In our study within the same education level, females had lower scores, suggesting additional factors beyond education. One of them could be the different social exposure and life-style of males versus females in this cultural group. Until the last decades, where this situation has changed, Arab women were underprivileged concerning education and employment (Okun et al., 2005). We verified whether working in the community might contribute to the performance. We found that MMSE scores are influenced by education and

not by occupation within genders. Frisoni et al. (1993) found a correlation between principal lifetime occupations with MMSE scores, independently from the effect of age and education. Independent influences of age, gender, education and occupation on cognitive test scores were reported in a study on African Caribbean elders (Steward et al., 2001).

In a dementia incidence study in India, the illiteracy of three-quarters of the cohort raised concern about the possibility of false positive cognitive screens. In their study, as in ours, the fact that all older adults in this community lived with their families allowed us always to question a relative, which was particularly useful when subjects were cognitively impaired. The effect of education beyond that of age was also observed in neuropsychological performance in Spanish (Ostrosky-Solis et al. 1998; Ostrosky-Solis et al. 2000).

The BCST (Davies, 1987) includes no items related to reading and writing. We found a highly significant correlation between MMSE and BCST scores in both genders. Despite the fact that it does not include items related to literacy, namely reading or writing, the BCST was still influenced by education as much as the MMSE.

A limitation of our study is the possibility that very mild dementias might have been unrecognized and misclassified as cognitively normal. Older adults in these villages do not live alone and are being cared for by their families. They live in a protected environment and certain functional limitations may be underestimated due to low expectations from the elderly.

Our results show that the Arabic translation of the MMSE is comparable to the original English MMSE for the appropriate education levels. Because of the effect of education on performance, different cut-off scores should be used in different education strata. Scores of females at low education levels should be considered cautiously to prevent false positive interpretation. All these render the use of Arabic MMSE difficult for screening of large whole populations, in which information on education might not be readily available. Still, in such cases, MMSE is useful for measuring change over time. This is particularly relevant for Wadi Ara, because previous studies have shown that AD is highly prevalent in this area (Farrer et al, 2003; Bowiratt et al., 2000).

At present, in younger generations, females in Wadi Ara are as educated as males; enjoy higher health literacy and work outside home (Okun et al. 2005; Elnekave and Gross, 2004). In a few decades, gender differences in MMSE may disappear. Our findings may serve clinical daily use and research purposes in Arab communities.

## Acknowledgments

## References

Al-Rajeh S, Ogunniyi A, Awada A, Daif A, Zaidan R. Preliminary assessment of an Arabic version of the mini-mental state examination. Annals of Saudi Medicine. 1999; 19:150–152. [PubMed: 17337959]

Bleecker ML, Bolla-Wilson K, Kawas C, Agnew J. Age-specific norms for the Mini-Mental State Exam. Neurology. 1988; 38:1565–1568. [PubMed: 3419600]

Bowiratt A, Friedland RP, Chapman J, Korczyn AD. The very high prevalence of Alzheimer's disease in an Arab population is not explained by high ApoE e4 allele frequency. Neurology. 2000; 55:731.

Bravo G, Hebert R. Age- and education-specific reference values for the mini-mental and modified mini-mental state examinations derived from a non-demented elderly population. International Journal of Geriatric Psychiatry. 1997; 12:1008–1018. [PubMed: 9395933]

Chandra V, Pandav R, Dodge HH, Johnston JM, Belle SH, DeKosky ST, Ganguli M. Incidence of Alzheimer's disease in a rural community in India: the Indo-US study. Neurology. 2001; 57:985–989. [PubMed: 11571321]

Crum RM, Anthony JC, Bassett SS, Folstein MF. Population-based norms for the mini-mental state examination by age and education level. Journal of the American Medical Association. 1993; 269:2386–2391. [PubMed: 8479064]

Davies, MA. Report of first phase: Design of a screening instrument for cognitive dysfunction in the elderly. Brookdale Foundation Publications; Jerusalem: 1987. Epidemiology of senile dementia in Jerusalem.

Elnekave E, Gross R. The healthcare experiences of Arab Israeli women in a reformed healthcare system. Health Policy. 2004; 69:101–116. [PubMed: 15484611]

Farrer LA, Bowiratt A, Friedland RP, Waraska K, Korczyn AD, Baldwin CT. Identification of multiple loci for Alzheimer's disease in a consanguineous Israeli-Arab community. Human Molecular Genetics. 2003; 12:415–422. [PubMed: 12566388]

Folstein MF, Folstein SE, McHugh PR. Mini-mental state: a practical method for grading the cognitive state of patients for the clinician. Journal of Psychiatric Research. 1975; 313:1419–1420.

Frisoni GB, Rozzini R, Bianchetti A, Trabucchi M. Principal lifetime occupation and MMSE score in elderly persons. Journal of Gerontology. 1993; 48:S310–S314. [PubMed: 8228005]

Hendrie HC, Ogunniyi A, Hall KS, Baiyewu O, Unverzagt FW, Gureje O, Gao S, Evans RM, Ogunseyinde AO, Adeyinka AO, Musick B, Hui SL. Incidence of dementia in Ibadan, Nigeria, and African American residing in Indianapolis, Indiana. Journal of the American Medical Association. 2001; 285:739–747. [PubMed: 11176911]

Li G, Shen C, Chen CH, Zhau YW, Li SR, Lu M. A three-year epidemiological survey of age-related dementia in an urban area of Beijing. Acta Psychiatrica Scandinavica. 1991; 83:99–104. [PubMed: 2017918]

Okun BS, Friedlander D. Educational stratification among Arabs and Jews in Israel: historical disadvantage, discrimination and opportunity. Population Study. 2005; 59:163–180.

Ostrosky-Solis F, Ardila A, Rosselli M, Lopez-Arango G, Uriel-Mendoza V. Neuropsychological performance in illiterates. Archives of Clinical Neuropsychology. 1998; 13:645–660. [PubMed: 14590626]

Ostrosky-Solis F, Lopez-Arango G, Ardila A. Sensitivity and specificity of the mini-mental state examination. Applied Neuropsychology. 2000; 7:25–31. [PubMed: 10800625]

Rait G, Burns A, Chew C. Age ethnicity and mental illness: a triple whammy. British Medical Journal. 1996; 313:1347–1348. [PubMed: 8956689]

Steward R, Richards M, Brayne C, Mann A. Cognitive function in UK community-dwelling African Caribbean elders: normative data for a test battery. International Journal of Geriatric Psychiatry. 2001; 16:518–527. [PubMed: 11376469]

World Health Organization (WHO). Fact Sheet No 135. Geneva: World Health Organization; 1998. Population ageing—a public health challenge.

Teng EL, Chui HC. The Modified Mini-Mental State (3MS) examination. Journal of Clinical Psychiatry. 1987; 48:314–318. [PubMed: 3611032]

Tombaugh TN, McIntyre NJ. The mini-mental state examination: a comprehensive review. Journal of the American Geriatrics Society. 1992; 40:922–935. [PubMed: 1512391]

Weiss BD, Reed R, Kligman EW, Abyad A. Literacy and performance on the mini-mental state examination. Journal of the American Geriatrics Society. 1995; 43:807–810. [PubMed: 7602038]
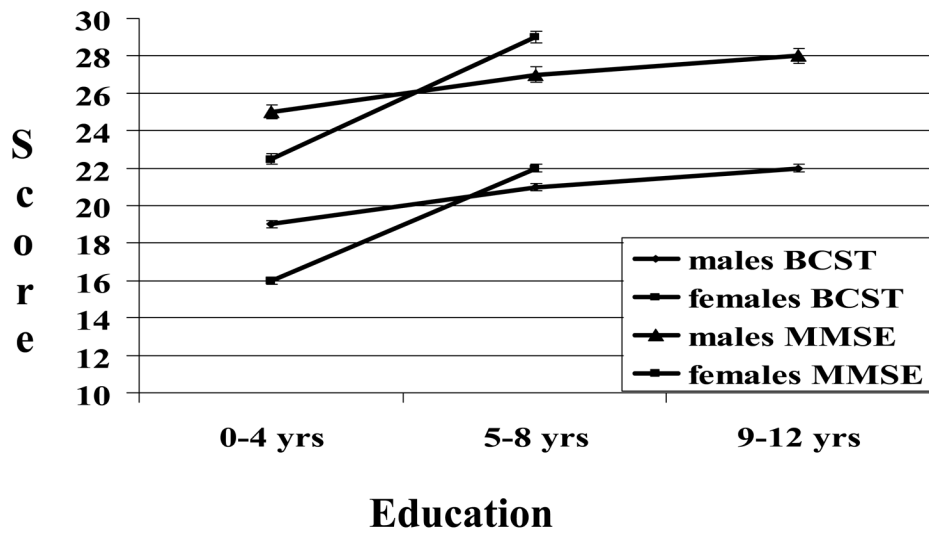
**Figure 1.**
Shown are the mean values of MMSE and BSCT scores for each education level for each gender separately. The vertical bars indicate the standard error values. The scores are significantly lower for females in education level 1 and significantly higher for education level 2. Education level 3 is not shown for females (n=1).

**Table 1**

MMSE and BCST scores by education level and gender

| Gender | Mean (SD) MMSE | 95% CI[#] | Mean (SD) BCST | 95 % CI[#] |
|---|---|---|---|---|
| Education level 1 (0–4 years) | | | | |
| Male | 25.0 (4.8) | 15–30 | 19.2 (4.5) | 10–24 |
| Female | 22.5(3.8) [*] | 15–30 | 16.2 (3.5) [*] | 10–23 |
| [##] English norms per age groups: | | | | |
| 65–74=22(2), 75–79= 21(2), 80–84=20(2), >85=19(3) | | | | |
| Education level 2 (5–8 years) | | | | |
| Male | 27.2 (3.0) | 21–30 | 20.9 (2.8) | 15–24 |
| Female | 28.9 (1.7) [**] | 26–30 | 22.5 (1.7) [**] | 19–24 |
| [##] English norms per age groups: | | | | |
| 65–74=26(2), 75–79= 25(2), 80–84=25(2), >85=23(3) | | | | |
| Education level 3 (9–12 years) | | | | |
| Male | 27.8 (3.8) | 26–30 | 22.3 (2.9) | 18–24 |
| Female | 30.0 | - | 24.0 | - |
| [##] English norms per age groups: | | | | |
| 65–70=28(1), 70–80=27(2), 80–84=25(2), >85=26(2) | | | | |

[*] Significantly lower than males (p<0.05)

[**] Significantly higher than males (p<0.05)

[#] The upper confidence limit exceeded the maximum possible score. Therefore, it was truncated at 30 for MMSE and 24 for BCST.

[##] Mean (SD) scores of norms of MMSE in the USA per age group (Crum et al. 1993)

**Table 2**

Occupational categories by education level and gender n (%)

| Gender | No work /housewife | Handy | Agriculture | Office |
|---|---|---|---|---|
| Education level 1 (0–4 years) | | | | |
| Male | 2 (3) | 25 (35) | 37 (52) | 7 (10) |
| Female | 22 (27) | 7 (9) | 53 (67) | 0 |
| Education level 2 (5–8 years) | | | | |
| Male | 1 (2) | 25 (45) | 26 (46) | 4 (7) |
| Female | 2 (13) | 6 (38) | 7 (44) | 1 (6) |
| Education level 3 (9–12 years) | | | | |
| Male | 0 | 7 (40) | 5 (29) | 5 (29) |
| Female | 0 | 1 (100) | 0 | 0 |
| Total | | | | |
| Male | 3 (2) | 57 (40) | 68(47) | 16 (11) |
| Female | 24 (24) | 14 (14) | 60 (60) | 1 (1) |

**Table 3**

MMSE and BCST scores by education level, gender and occupation category – Mean (SD)

| Gender | No work /housewife | Handy | Agriculture | Office |
|---|---|---|---|---|
| **MMSE scores** | | | | |
| Education level 1 (0–4 years) | | | | |
| Male | 21.5 (2.1) | 25.2 (4.7) | 24.9 (5.3) | 26.8 (3.3) |
| Female | 23.7 (3.8) | 26.1 (2.0) | 22.0 (3.7) | - |
| Education level 2 (5–8 years) | | | | |
| Male | 19.0 (–) | 27.3 (2.6) | 27.1 (3.1) | 28.8 (1.5) |
| Female | 29.0 (1.4) | 28.5 (2.0) | 29.3 (1.1) | 29.0 (–) |
| Education level 3 (9–12 years) | | | | |
| Male | 28.9 (1.2) | 28.9 (1.2) | 25.2 (6.0) | 28.6 (2.6) |
| Female | - | 30.0 (–) | - | - |
| **BCST Scores** | | | | |
| Education level 1 (0–4 years) | | | | |
| Male | 14.5 (0.7) | 19.7 (3.4) | 18.4 (5.0) | 21.2 (2.9) |
| Female | 17.9 (3.6) | 18.4 (4.0) | 15.5 (3.1) | - |
| Education level 2 (5–8 years) | | | | |
| Male | 16.0 (–) | 21.6 (2.5) | 20.6 (2.7) | 22.0 (2.5) |
| Female | 21.5 (0.7) | 22.5 (2.0) | 22.6 (1.8) | 24.0 |
| Education level 3 (9–12 years) | | | | |
| Male | 23.6 (0.8) | 23.8 (0.8) | 19.8 (4.3) | 23.0 (1.7) |
| Female | - | 24.0 | - | - |