Clinical Validation of the Geriatric Mental State Schedule - Automated Geriatric Examination for Computer Assisted Taxonomy

Tengku Aizan Hamid, Suraya Yusoff, Esther Gunaseli Ebenezer, Chai Sen Tyng* & Siti Suhailah Abdullah
DISTRIBUTION OF OLDER MALAYSIANS BY DISTRICT AND STATE, 2000

<table>
<thead>
<tr>
<th>State</th>
<th>Percent</th>
<th>0.00 - 1.99</th>
<th>2.00 - 3.99</th>
<th>4.00 - 5.99</th>
<th>6.00 - 7.99</th>
<th>8.00 - 9.99</th>
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<th>12.00 - 13.99</th>
<th>14.00 - 16.00</th>
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<td>0.1</td>
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LIFE EXPECTANCY AT 60: ETHNIC AND SEX DIFFERENCES

- Average life expectancy at birth in 1957
  - Male 55.8
  - Female 58.2
- Average life expectancy at birth in 2005
  - Male 70.6
  - Female 76.4
- Median age of the Malaysian population has increased from 17.6 years in 1960 to 24.7 years in 2005.
MENTAL HEALTH AND QUALITY OF LIFE OF OLDER MALAYSIANS

- Past epidemiological studies on mental health of the older Malaysian population were often limited in scope and locality.
- According to Chen and his colleagues (WHO, 1984), forgetfulness, feelings of tiredness, sleeping difficulties and lost of interest were common mental health problems faced by the elderly.
- In the 1996 National Health and Morbidity Survey II (NHMS-2), the overall observed prevalence of psychiatric morbidity among older Malaysians (60 years and over) was 26.0%, assessed using the GHQ-12.
- The assessment of quality of life in old age is subjective with the use of proxy measures.
- The Malaysian Quality of Life Index (MQLI), monitored by the Economic Planning Unit (EPU), captures indices of 10 areas determined by macro indicators.

THE PROJECT

MENTAL HEALTH AND QUALITY OF LIFE OF OLDER MALAYSIANS

- Funded by the Ministry of Science, Technology and Innovation (MOSTI) through the Intensified Research in Priority Areas (IRPA) Programme under the eighth Malaysia Plan (RMK-8).
- There were three (3) projects under the Programme for Mental Health and Quality of Life.
- The project on Mental Health and Quality of Life of Older Malaysians was led by A. P. Dr. Tengku Aizan Hamid.
- Duration of the project was three (3) years from 2002 to 2005, with an additional extension year.
- A quantitative survey was completed in 2005 with 2,980 older persons in all the 13 Malaysian states and the F.T. of K.L.
STUDY OBJECTIVES

- To identify the relationship between mental health and quality of life of older Malaysians
- To investigate the prevalence of mental health problems among elderly Malaysians
- To investigate the relationship between stress, coping resources and mental health status

Some Members of the Research Team:

<table>
<thead>
<tr>
<th>No.</th>
<th>Researcher</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Prof. Sarinah Low Abdullah, Psychologist</td>
<td>HeRDU, University of Malaya</td>
</tr>
<tr>
<td>2.</td>
<td>Assoc. Prof. Dr. Rosnah Ismail, Psychologist</td>
<td>Universiti Malaysia Sabah</td>
</tr>
<tr>
<td>3.</td>
<td>Dr. Suraya Yusoff, Psychogeriatrician</td>
<td>Hosp. Sultanah Aminah, J. B.</td>
</tr>
<tr>
<td>5.</td>
<td>Dr. Ismail Drahman, Psychogeriatrician</td>
<td>Hosp. Sentosa, Sarawak</td>
</tr>
<tr>
<td>6.</td>
<td>Dr. Esther Gunasel a/p Ebenezier</td>
<td>Royal College of Medicine, Perak</td>
</tr>
<tr>
<td>7.</td>
<td>Mrs. Shanui Shabas, Lecturer (Nursing)</td>
<td>Universiti Malaysia Sarawak</td>
</tr>
</tbody>
</table>

METHODOLOGY I

- Area samples of older persons in the community were identified with assistance from the DOSM for the MHQOLOM study.
- Multistage sampling was used to achieve an appropriate nationwide representation of the older population for the cross-sectional survey, proportionately distributed across the states.
- Trained enumerators conducted face-to-face interviews with one family member for every household in randomly selected Enumeration Blocks.
- A selection grid was used to achieve parity in sample sex distribution.
- Data collection was completed in 2005 and entered into SPSS for analysis.
- Response rate for the study was 88%.
Geriatric Mental State (GMS)

- The GMS is a standardized, semi-structured interview for examining and recording the mental state in elderly subjects by classifying patients according to their symptom profile (Copeland, 1986).
- The Geriatric Mental State questionnaire (B3) was used in the study, assessing organixity, depression and anxiety.

Automated Geriatric Examination for Computer Assisted Taxonomy (AGECAT)

- AGECAT is a computerized diagnostic system for use with the Geriatric Mental State (GMS) (Dewey, 1999).
- It provides syndrome cluster diagnoses and a differential diagnosis where confidence level three (3) in each of the clusters agrees with psychiatrists’ diagnosis of a case.
- Diagnosis were made with the AGECAT (DOS-based) program and output data were reentered into SPSS and case-matched.

GMS-AGECAT Clinical Validation

- This study aims to investigate the level of agreement between a GMSAGECAT diagnosis and clinical diagnosis of mental disorder among older persons living in the community.
- A two-phase epidemiological design was used where trained interviewers first administered translated versions of the GMS (B3) to a nationwide older Malaysian sample (n = 2,980) in a door-to-door survey.
- The GMS B3 generates diagnoses for organicity, depression and anxiety disorder on six levels of confidence (0 - 5), with levels 3 and greater representing likely cases warranting professional intervention.
- Out of 381 respondents in the state of Johor, 120 older persons were randomly selected for home examination by a clinical psychiatrist (geriatrics) who is blind to the earlier survey results.
Results & Discussion

- A comparison of the diagnoses derived from the lay interviewers and the clinician yielded an overall agreement of 76.2% (n = 105) with a moderate Kappa value of 0.502 (95% CI 0.319 - 0.649) [sensitivity = 67.4%; specificity = 82.3%].
- Further analysis showed that the GMS-AGECAT (B3 version) reported higher agreement for organic disorders but not depression. In addition, higher level of education was associated with increased sensitivity, especially for organicity.
- Due to limitations of a small sample size, attrition and lapse of time in between the two phases, further studies are needed to determine the cross-cultural validity and reliability of the GMS-AGECAT algorithm among the older population in Malaysia.

Conclusion

- The adoption of a rapid GMS-AGECAT diagnosis version would enable a quick and accurate screening assessment of mental disorders by non-clinicians in a community setting.
- This will help in highlighting cases for further medical attention.
METHODOLOGY II

MENTAL HEALTH AND QUALITY OF LIFE OF OLDER MALAYSIANS

- Cross-sectional survey in 13 states & 1 F.T.; 60+ [n = 2,980]
  - Johor 12.8% n = 382
  - Kedah 9.1% n = 271
  - Kelantan 6.5% n = 194
  - Malacca 3.6% n = 108
  - Negeri Sembilan 4.8% n = 144
  - Pahang 6.0% n = 178
  - Pulau Pinang 7.6% n = 227
  - Perak 15.1% n = 451
  - Perlis 1.5% n = 44
  - Selangor 11.9% n = 355
  - Terengganu 3.9% n = 117
  - Sabah 7.3% n = 218
  - Sarawak 4.2% n = 124
  - Kuala Lumpur 5.6% n = 167

DESCRIPTIVE STATISTICS

- Age
  - 2163, 72%
  - 672, 23%
  - 138, 5%
- Sex
  - 1503, 50%
  - 1477, 50%
- Stratum
  - 1692, 56%
  - 1298, 44%
- Ethnicity
  - Malay 58%
  - Chinese 25%
  - Indian 11%
  - Bumiputera 5%
  - Others 1%
- Marital Status
  - 138, 5%
  - Now Married 56%
- Work Status
  - Not Working 28%
  - Working 72%
- Education
  - No Formal Education 45%
  - Primary Education 45%
  - Secondary Education 15%
  - Tertiary Education 5%
The first stage of AGECAT analysis for the three syndrome clusters yielded a crude prevalence rate for organic disorder (14.4%), undifferentiated depression (11.7%) and anxiety (1.6%).

There is a difference in the prevalence of organic disorder and depression by ethnicity. Older persons of Malay and Bumiputera descent reported higher proportion of mental disorder.

χ² = 62.91, p = 0.000

χ² = 34.04, p = 0.000

Older persons who were diagnosed with organic disorder have a higher mean age.
Depression syndrome cluster by sex

- A higher proportion of older women were diagnosed with undifferentiated depression.

### Bivariate Statistics II

- **Gender Distribution**: 223 (Female) vs. 215 (Male)

- **Chi-square Test**: $\chi^2 = 38.567, p = 0.000$

### Descriptive Statistics for Variables in Regression Analysis

Summary of bivariate statistics of selected predictors of mental disorder among older persons.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>Organic Disorder</th>
<th>Depression</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>$\chi^2$ or $t$</td>
<td>$\chi^2$ or $t$</td>
</tr>
<tr>
<td>Stratum (Urban = 1)</td>
<td>0.564</td>
<td>0.496</td>
<td>44.214 **</td>
<td>3.415</td>
</tr>
<tr>
<td>Sex (Male = 1)</td>
<td>0.496</td>
<td>0.500</td>
<td>76.159 **</td>
<td>38.567 **</td>
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<tr>
<td>Ethnicity (Malay = 1)</td>
<td>0.691</td>
<td>0.462</td>
<td>59.029 **</td>
<td>72.547 **</td>
</tr>
<tr>
<td>Marriage Status (Married = 1)</td>
<td>0.559</td>
<td>0.497</td>
<td>53.366 **</td>
<td>39.633 **</td>
</tr>
<tr>
<td>Employment (Working = 1)</td>
<td>0.281</td>
<td>0.450</td>
<td>13.207 **</td>
<td>8.079</td>
</tr>
<tr>
<td>Income Category</td>
<td>1.528</td>
<td>1.122</td>
<td>110.256 **</td>
<td>36.023 **</td>
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<tr>
<td>Age</td>
<td>70.464</td>
<td>7.216</td>
<td>-8.449 **</td>
<td>-3.040 **</td>
</tr>
<tr>
<td>Level of Education</td>
<td>0.665</td>
<td>0.696</td>
<td>201.905 **</td>
<td>25.231 **</td>
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Note: $n = 2980$. Chi-square test used for categorical and ordinal variables; $t$-test for Age.  
* $p < 0.05$, ** $p < 0.01$
## Summary of Logistic Regression Analysis Predicting Organic Disorder (n = 2542)

<table>
<thead>
<tr>
<th>Predictor</th>
<th>B</th>
<th>SE</th>
<th>Wald</th>
<th>Odds Ratio</th>
<th>95% CI</th>
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</thead>
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<tr>
<td>Stratum</td>
<td>-0.300</td>
<td>0.127</td>
<td>5.594 *</td>
<td>0.741</td>
<td>0.578-0.950</td>
</tr>
<tr>
<td>Sex</td>
<td>-0.396</td>
<td>0.146</td>
<td>7.351 **</td>
<td>0.673</td>
<td>0.506-0.896</td>
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<tr>
<td>Ethnicity</td>
<td>0.825</td>
<td>0.180</td>
<td>20.999 **</td>
<td>2.281</td>
<td>1.603-3.246</td>
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<tr>
<td>Marriage Status</td>
<td>-0.134</td>
<td>0.142</td>
<td>0.893</td>
<td>0.874</td>
<td>0.662-1.155</td>
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<td>Employment</td>
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<td>0.157</td>
<td>0.140</td>
<td>0.943</td>
<td>0.693-1.283</td>
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<td>Income Category</td>
<td>-0.224</td>
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<td>12.635 **</td>
<td>0.799</td>
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<td>Age</td>
<td>0.034</td>
<td>0.008</td>
<td>16.054 **</td>
<td>1.034</td>
<td>1.017-1.052</td>
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<tr>
<td>Level of Education</td>
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<td>0.137</td>
<td>57.944 **</td>
<td>0.351</td>
<td>0.288-0.460</td>
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<tr>
<td>Constant</td>
<td>-3.714</td>
<td>0.666</td>
<td>31.106</td>
<td>0.024</td>
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* p < 0.05 .  ** p < 0.01

Note: \( \chi^2 = 298.869, \text{df} = 8, p = 0.000, \text{Nagelkerke's R}^2 = 0.198 \)

## Summary of Logistic Regression Analysis Predicting Undifferentiated Depression (n = 2521)

<table>
<thead>
<tr>
<th>Predictor</th>
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<th>SE</th>
<th>Wald</th>
<th>Odds Ratio</th>
<th>95% CI</th>
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<tbody>
<tr>
<td>Sex</td>
<td>-0.429</td>
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<td>8.135 **</td>
<td>0.651</td>
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<td>0.681</td>
<td>0.510-0.909</td>
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<td>0.895</td>
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<tr>
<td>Income Category</td>
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<td>2.664</td>
<td>0.901</td>
<td>0.794-1.021</td>
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<tr>
<td>Age</td>
<td>0.006</td>
<td>0.009</td>
<td>0.465</td>
<td>1.006</td>
<td>0.988-1.024</td>
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<td>0.115</td>
<td>1.142</td>
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<td>0.706-1.108</td>
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<td>0.696</td>
<td>11.310</td>
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</table>

* p < 0.05 .  ** p < 0.01

\( \chi^2 = 86.020, \text{df} = 7, p = 0.000, \text{Nagelkerke's R}^2 = 0.064 \)
SIGNIFICANT PREDICTORS OF ORGANIC DISORDER AND DEPRESSION

- Malay & Bumiputera
  - OR = 2.281
- Lower Education
  - Malay & Bumiputera
    - OR = 2.052
  - Female
    - OR = 0.651
- Rural
  - Not Married
    - OR = 0.681
- Lower income
  - OR = 0.799
- Older Age
  - OR = 1.034

MENTAL HEALTH

- Effective intervention programs are needed to help groups at risk for protracted medical complications to improve their health.
- Health care for the elderly should be holistic, not only focusing on the physical, social and economic well-being, but should also not neglect the mental well-being of the person.
- Dementia and depression are the most common mental disorders found among the elderly living in the community. Thus, there is an urgent need for early detection and treatment.
- Family members should be educated on its early symptoms and seek medical treatment for mental disorders.
Mental health service delivery should be developed simultaneously with the generic geriatric services. The planning for these 2 services should be given the greatest urgency and priority.

Primary care providers have an important role in the detection and management of mental health problems in the elderly. All primary care practitioners and allied health care providers need to be trained to identify and treat common mental illness, especially dementia and depression.

Training should be provided to all those involved in providing care for the elderly including healthcare workers, family caregivers, formal caregivers, social workers, volunteers and others.

A public education program is required to improve the awareness of mental health problems in the elderly and the general population.

The results warrant more population based study to identify risk factors associated with mental health problems and take appropriate preventive measure.

More research is needed in order to improve the quality of life of the elderly with mental health problems and their caregivers.
THANK YOU / TERIMA KASIH