Factors Affecting the BODE Index of Thai Older Adults with COPD

Rewwadee Petsirasan, PhD, RN
Naiyana Noonil, PhD, RN
Saifon Aekwarangkoon, PhD, RN

School of Nursing, Walailak University

Tha Sala subdistrict, Nakhon Si Thammarat, Thailand
Background

Chronic Obstructive Pulmonary Disease (COPD) will be the 5th leading cause of disability (DALYs) and the 4th leading cause of death by 2030.

Age-related physiological changes contribute to impaired pulmonary function and contribute to the increased prevalence of COPD with age.

At age 70 years, FEV$_1$ decreased by about 30%, FVC expected to decline by about 20%, and FEV$_1$/FVC expected about 74% (GOLD, 2013)
Morbidity and mortality resulting from COPD relate to the real impact of the disease. The specific instrument for self-evaluation of health in this disease, may be complementary to the BODE index, an indicator of mortality (Tashkin, 2011)

Recently a multidimensional grading system based on the BODE index - has begun to be used increasingly for the evaluation COPD patients. It is capable of predicting COPD-related hospitalization and mortality more than its individual components (Celli et al., 2008)

The BODE index was a better predictor of exacerbation than the FEV1 alone \( (p < 0.01) \) (Marin et al., 2008)
Objective of the study

To examine factors attribute to the severity of COPD among older adults with COPD in southern Thailand
Inclusion criteria

1. Age 60 years and above at the time of the initial screening;
2. Postbronchodilator FEV$_1$/FVC ratio < 0.70
3. Postbronchodilator FEV$_1$ percent predicted ≤ 70 percent
4. Good cognitive function which was assessed by standard Mini Mental Status Examination (Thai Version 2002)
5. Good functional status was assessed by Barthel ADL Index
6. Willing to participate fully in all aspects of the intervention
Systemic random sampling was used to recruit 105 COPD participants attending at Health Centers & Community Hospital, Nakhon Si Thammarat Southern Region of Thailand
Instruments for Data Collection

- **Socio-demographic Sheet**
  Personal data: age, gender, education and income;
  Health status: re-hospitalization, length of stay, ER-Visit depression
  Smoking status: current smoking, packed-year

- **Personal Health Questionnaire Depression Scale (PHQ-9)**
  a screening tool of major depression consists of 9 items rating from 0 (none) to 4 (every day), with sensitivity = 0.84 and specificity = 0.77 (Lottrakul M, Sumrithe S, Saipanish R, 2008)

- **Severity of COPD : BODE index sheet**
BODE INDEX

Body-Mass Index

Degree of Airflow Obstruction (FEV$_1$ % predicted)

Dyspnea (MMRC score)

Exercise Capacity (6MWD)

The higher scores indicate a higher risk of death
### Scoring the BODE Index (Celli et al, 2004)

<table>
<thead>
<tr>
<th>Component</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEV₁% predicted</td>
<td>≥ 65</td>
<td>50-64</td>
<td>36-49</td>
<td>≤ 35</td>
</tr>
<tr>
<td>6MWD (m)</td>
<td>≥ 350</td>
<td>250-349</td>
<td>150-249</td>
<td>≤ 149</td>
</tr>
<tr>
<td>MMRC</td>
<td>0-1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>&gt; 21</td>
<td>≤ 21</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total BODE Index score = 0 to 10 units**
1. **Number, Percentage, Mean, SD** were used to describe the demographic characteristics of the participants.

2. **Multiple Regression Analysis (Stepwise technique)** was used to determine factors explained BODE index.
Most patients (84%) were male; they had a mean (SD) age of 72 (8) years and mild to severe COPD (post-bronchodilator FEV\textsubscript{1} 69% (10) predicted) with BODE index score 3 (2) points.

Nearly half of them (47%) were in Quartile 1 (0-2 scores), followed by Quartile 3 (5-6 scores) (25%) and Quartile 2 (3-4 scores) (23%) of BODE index.
Table 1 Correlation Matrix among variables (n=105)

<table>
<thead>
<tr>
<th>Variable</th>
<th>BODE index</th>
<th>Age</th>
<th>Income</th>
<th>LOS</th>
<th>ER Visit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>.260**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td>-.252**</td>
<td>-.242*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LOS</td>
<td>.202*</td>
<td>-.036</td>
<td>-.050</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ER Visit</td>
<td>.033</td>
<td>-.073</td>
<td>.039</td>
<td>.602**</td>
<td></td>
</tr>
<tr>
<td>Depress</td>
<td>.237*</td>
<td>.086</td>
<td>-.139</td>
<td>.141</td>
<td>.183</td>
</tr>
</tbody>
</table>
Table 2 Stepwise multiple regression for the BODE index score (n=105)

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>SE</th>
<th>β</th>
<th>p</th>
<th>$R^2$ change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>.069</td>
<td>.025</td>
<td>.251</td>
<td>.008</td>
<td>.068</td>
</tr>
<tr>
<td>Depression</td>
<td>.416</td>
<td>.204</td>
<td>.19</td>
<td>.044</td>
<td>.047</td>
</tr>
<tr>
<td>Length of stay</td>
<td>.036</td>
<td>.018</td>
<td>.185</td>
<td>.050</td>
<td>.033</td>
</tr>
<tr>
<td>Constant</td>
<td>-2.83</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td></td>
<td></td>
<td></td>
<td>0.15</td>
<td></td>
</tr>
</tbody>
</table>
Recommendations

- The development of clinical therapeutics of prevention and reduction the severity of COPD in patients living with COPD should be considered the different of socio-demographics background and concerned the influence of depression on older adults with COPD.

- Further research should replicate the study among participants from several geographical areas are needed to broader the generalizability.
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- Institute of Research and Development, Walailak University

Contact

School of Nursing, Walailak University

222 Mu 10 Tha Sala district

Nakhon Si Thammarat

80161

E-mail: prewwade@wu.ac.th  Tel: 6675672101-2
Thank you for your attention