SLEEP PROBLEMS OF SERVICE USERS OF ELDER CARE IN HONG KONG - THE USE OF THE CANTONENSE VERSION PITTSBURGH SLEEP QUALITY INDEX

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1. Hong Kong (HK) in a glance

Table 1: Hong Kong as an aging society

<table>
<thead>
<tr>
<th>Year (2003)</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>10%</td>
<td>18.56%</td>
</tr>
<tr>
<td>2010</td>
<td>37.50%</td>
<td>46.50%</td>
</tr>
<tr>
<td>2030</td>
<td>72.5</td>
<td>85.9</td>
</tr>
<tr>
<td>2050</td>
<td>76</td>
<td>88</td>
</tr>
</tbody>
</table>

Figure 1: Increasing percentage of 60+/total population from 1981 to 2050

Figure 2: Life expectancy from 1981 to 2030

2. Introduction

2.1 Sleep problems

a. Sleep problems increase with age and constitutes some of the most difficult afflictions in late life (Cuellar, Rogers, Hisghman & Volpe, 2007; McCall, 2005).

b. Patients with insomnia report difficulty in initiating sleep, difficulty in maintaining sleep, or early morning awakening (Ohayon, Caulet, Priest, & Guilleminault, 1997).

c. Possible causes of sleep problems

- Sleep disorders (e.g., narcolepsy or sleep apnea)
- Physical illnesses and medication (e.g., chronic infections and sleep allergy)
- Emotional factors (e.g., anxiety, depression or stress)
- Lifestyle factors, such as too much coffee and decreased activity levels
- Environmental factors, such as noise, and overcrowding (Bootzin & Engle-Friedman, 1987).
- Among all factors, depression is the psychiatric diagnosis most commonly associated with insomnia (Ancoli-Israel, 2004; Pigeon et al., 2008).
2. Introduction

2.2 Study objectives

a. Translate and validate a widely-used measure on sleep quality, namely the Pittsburgh Sleep Quality Index (PSQI), for use with older Chinese.

b. Explore the sleep problems of Chinese users of elder care in Hong Kong using the Chinese version PSQI (C-PSQI)

c. Identify demographic and psycho-social factors associated with sleep problems.
3. Methods: Overall

3.1 Two stages

**Stage 1:** Scale validation

**Stage 2:** A cross-sectional survey exploring the prevalence of sleep problems and their predictors.
3. Methods: Overall

3.2 Measures

a. PSQI (Buysse, Reynolds, Monk, Berman & Kupfer, 1989)

- A 19-item self-rating tool designed to assess the sleep quality and pattern of sleep during the past month
- Seven components: subjective sleep quality, sleep-onset latency, sleep duration, sleep efficiency, sleep disturbances, use of sleeping medications, and daytime dysfunction
- Each component score ranges from 0 to 3, yielding a global score of sleep quality ranging from 0 to 21, higher scores indicate poorer sleep quality.
- A PSQI global score of 5 or above is an indicator of poor quality sleep.
- Widespread application in a variety of populations and validated in many different languages
3. Methods: Overall

3.2 Measures

b. Geriatric Depression Scale Short Form (GDS-SF; Lee et al., 1993)

- 15 items
- Total score ranged from 1 to 15
- The higher the score, the higher is the level of depression.
- In this study, >7 will be used as the cut-off score (Lee, Chiu, & Kwong, 1994).
4. Stage 1: Scale Validation - Methods

4.1 Pre-test

a. Conducted in September to October 2005

b. PSQI was translated into Chinese and then back-translated into English by two different translation experts.

c. Participants (N = 17): ageing 60 or above, including 9 women and 8 men, 10 physically healthy and 7 frail.

d. Face-to-face interviews by trained interviewers were adopted for data collection.

e. The wordings and presentation of the C-PSQI were then revised according to the participants’ responses.
4. Stage 1: Scale Validation - Methods

4.2 Validation survey

a. Selection criteria for participants:
- older people aged 60 or over
- cognitively intact
- able to communicate verbally with the interviewers
- using either community or residential services of the largest NGO serving older people in Hong Kong.

b. The staff members of the service units were asked to identify service users who met the sampling criteria.
4. Stage 1: Scale Validation - Methods

4.2 Validation survey

c. Individual participants’ consent to participate in the study was then sought by the interviewers who were social sciences undergraduates.

d. To establish the C-PSQI’s reliability over time, the participants were interviewed again one week later.

e. Seventy-five participants were successfully interviewed twice.
5. Stage 1: Scale Validation - Results

The reliability and validity of C-PSQI

a. SPSS was used.
b. Internal consistency: moderate, with cronbach’s alpha of .68
c. Test re-test reliability & inter-rater reliability established
e. Convergent validity: positive but moderate, with the Pearson Correlation coefficient between PSQI and the GDS as .32 ($p < .01$)

→ C-PSQI was moderately reliable and valid for use with older Chinese.
6. Stage 2: Main Survey - Methods

6.1 The Sample

a. The sampling criteria were similar to the validation survey

b. The sampling frame: all service users from the largest NGO in elder care in Hong Kong.

c. The study participants were recruited from all its 8 community centres and 4 residential care homes, which were located in all five geographic regions of Hong Kong, thus included older people of various socio-economic statuses.
6. Stage 2: Main Survey - Methods

6.1 The Sample

d. A sample size of 400 was planned, with three-quarter from community care units and one-quarter from residential care homes.

e. The participants were randomly selected from a list of all service users meeting the sampling criteria in each centre and care home.

f. Finally, 420 older people were contacted, and 406 (97%) were successfully interviewed.
6. Stage 2: Main Survey - Methods

6.2 Data collection method

a. After getting informed consent, face-to-face interviews were carried out by trained interviewers who were social sciences undergraduates in service units of the NGO in a room free from disturbances, e.g. interview room, conference room or nursing room.
7. Stage 2: Main Survey - Results

7.1 Participant characteristics

Table 1: Demographical characteristics of participants (N = 406)

<table>
<thead>
<tr>
<th>Sex</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>33.3%</td>
<td>66.7%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>60 – 69</th>
<th>70 – 79</th>
<th>&gt;80</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6.5%</td>
<td>44.3%</td>
<td>39.2%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Marriage Status</th>
<th>Married</th>
<th>Widowed</th>
<th>Never got married</th>
<th>Divorced or separated</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>48.5%</td>
<td>40.9%</td>
<td>5.4%</td>
<td>5.2%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Residence</th>
<th>Community</th>
<th>Aged care home</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>77.3%</td>
<td>22.7%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Educational Status</th>
<th>No formal education</th>
<th>Primary education</th>
<th>Secondary education</th>
<th>Tertiary education</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>34.7%</td>
<td>26.6%</td>
<td>7.2%</td>
<td>4.0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Depression</th>
<th>Not depressed</th>
<th>Depressed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>80.2%</td>
<td>19.8%</td>
</tr>
</tbody>
</table>

Note. a The GDS cutoff score of more than 7 was used.
7. Stage 2: Main Survey - Results

7.2 Sleep quality

a. The mean C-PSQI scores was 8.28 (SD=4.11).
b. Principal Component Analysis found the 7 components clustered into 3 domains, which can be classified as perceived sleep quality, daily disturbances and sleep medication.

c. Their mean scores were 1.42 (SD=.73), .93 (SD=.88) and .29 (SD=.85) respectively.

→ The participants had more problems with perceived sleep quality, followed by daily disturbances, and there was a low use of sleep medication.
7. Stage 2: Main Survey - Results

7.2 Sleep quality

*Table 2: Factor Matrix for the 3-Domains of C-PSQI (N=406)*

<table>
<thead>
<tr>
<th>Domains of C-PSQI</th>
<th>Perceived Sleep Quality</th>
<th>Daily Disturbances</th>
<th>Sleep Medication</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Subjective sleep quality</td>
<td>0.70</td>
<td>0.30</td>
<td>0.05</td>
</tr>
<tr>
<td>2. Sleep latency</td>
<td>0.69</td>
<td>0.07</td>
<td>0.06</td>
</tr>
<tr>
<td>3. Sleep duration</td>
<td>0.76</td>
<td>-0.53</td>
<td>0.03</td>
</tr>
<tr>
<td>4. Habitual sleep efficiency</td>
<td>0.81</td>
<td>-0.46</td>
<td>-0.05</td>
</tr>
<tr>
<td>5. Sleep disturbances</td>
<td>0.57</td>
<td>0.40</td>
<td>0.00</td>
</tr>
<tr>
<td>6. Use of sleep medications</td>
<td>0.11</td>
<td>0.18</td>
<td>0.95</td>
</tr>
<tr>
<td>7. Daytime dysfunction</td>
<td>0.47</td>
<td>0.57</td>
<td>-0.34</td>
</tr>
</tbody>
</table>

Extraction Method: Principal Component Analysis.
7. Stage 2: Main Survey - Results

7.2 Sleep quality

e. With the PSQI global score 5 or above as the cutoff point, 68.81% of the participants would be seen as having some sleep problems.

f. Only 34.7% of the participants self-reported to be suffering from insomnia. Among them, 78% had it for more than one year, 51.0% did not seek help, and 16.5% could not find any suitable persons to help.
7. Stage 2: Main Survey - Results

7.3 Factors associated with insomnia

c. There were significant difference of the means C-PSQI scores

<table>
<thead>
<tr>
<th>Table 4: Differences in C-PSQI scores</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>M</td>
</tr>
<tr>
<td>--------------------------------------</td>
</tr>
<tr>
<td>Sex: Male</td>
</tr>
<tr>
<td>Sex: Female</td>
</tr>
<tr>
<td>Residence Community</td>
</tr>
<tr>
<td>Residence Aged care home</td>
</tr>
<tr>
<td>Self-reported insomnia: Not reported</td>
</tr>
<tr>
<td>Self-reported insomnia: Reported</td>
</tr>
</tbody>
</table>

* p<0.05    **p<0.01   ***p<0.001
7. Stage 2: Main Survey - Results

7.3 Factors associated with insomnia

Table 4: Standardized Regression Coefficients of Demographic and Personal Variables on C-PSQI (N=406)

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.116*</td>
<td>0.079</td>
</tr>
<tr>
<td>Gender (Female)</td>
<td>0.105*</td>
<td>0.023</td>
</tr>
<tr>
<td>Education level</td>
<td>-0.143**</td>
<td>-0.068</td>
</tr>
<tr>
<td>Perceived health^</td>
<td>0.146***</td>
<td></td>
</tr>
<tr>
<td>Perceived financial adequacy</td>
<td></td>
<td>0.033</td>
</tr>
<tr>
<td>Depression (Geriatric Depression Scale)</td>
<td>0.218***</td>
<td></td>
</tr>
<tr>
<td>Living in institution</td>
<td></td>
<td>0.114**</td>
</tr>
<tr>
<td>Self-reported insomnia</td>
<td></td>
<td>0.416***</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.059</td>
<td>0.435</td>
</tr>
</tbody>
</table>

* p<0.05    **p<0.01    ***p<0.001
Dependent variable: C-PSQI
^ 5 point scale with 1 being very good to 5 being very bad
7. Stage 2: Main Survey - Results

7.4 Reliability and validity of PSQI

a. Internal consistency: satisfactory, with cronbach’s alpha of .71
b. Convergent validity: positive but moderate, with the Pearson Correlation coefficient between PSQI and the GDS as .49 (p < .001)

→ Together with the findings of the pilot study and the validation survey, C-PSQI was found to be moderately reliable and satisfactorily valid for use with the Chinese elders.
8. Discussion

a. Sleep problems in late-life are common

- At least one-third of the participants reported having insomnia at the time of the study.
- C-PSQI revealed that the participants had the greatest problems with perceived sleep quality, including taking long time to fall asleep, poor assessment of sleep quality, short sleep duration, low sleep efficiency, and various sleep disturbances (e.g. early awakening or frequent waking-up during the night to go to the bathroom, feeling too hot/cold or having pain).
- The participants might have trouble staying awake while engaging in social activities or eating meals; and might have problem keeping up enthusiasm to get things done in the last month before the time of the study.
8. Discussion

b. More sleep problems among institutionalized elders

➢ To the best of our knowledge, this study was the first one to find living in institutions predicts sleep problems, possibly due to the following reasons.

- Severe lack of land in Hong Kong: Noise, lack of privacy and other environmental disturbances might affect the residents’ sleep quality.

- Physical and mental illnesses: Older residents usually suffer more physical and mental illnesses (Census and Statistics, 2005) which might bring about sleep disturbances.

- Chinese culture: For Chinese older people, admission to residential care homes might imply a sense of parental failure and loss of respect. The feelings of abandonment and distress might affect their sleep quality.
8. Discussion

c. Depression predicted sleep problems

Similar to other studies (Staner, 2010; Vollrath, Wicki & Angst, 1989), depression was found to predict sleep problems, as the second most powerful predictor, after self-reported insomnia.

A vicious cycle of mood and sleep: Depressed mood reduces sleep quality and sleep quantity. On the other hand, adverse effect of poor sleep (e.g. daytime fatigue) causes psychological distress.

Intervention on sleep problems is recommended to tackle both the sleep disturbances and depression simultaneously.
8. Discussion

d. Low level of help-seeking

- The present study found that a high percentage (78%) of respondents with self-reported insomnia had been suffering from the problem for one year or above.
- Half (51.0%) of them never sought help.
- Only 10% of the participants took any medications to help them sleep.

Possible reasons

- The respondents might feel that sleep problems were just phenomena of the normal aging process.
- It might reflect the stigmatization associated with mental health and psychiatric treatment (Chiu et al., 1999).
- The percentage of participants using of sleep medications was low.

→ *A possible reluctance of the Chinese elders to the use of pharmacological interventions in sleep disturbances*
8. Discussion

e. Insufficient service available

- 16.6% of the participants had tried to seek help but could not find a suitable service or person

→ Insufficient treatment opportunities or a lack of knowledge about how to get help
8. Discussion

f. PSQI cutoff score

- A discrepancy was found between self-report and C-PSQI scores

- About one-third (34.7 %) of the participants perceived themselves as suffering from insomnia, which was much lower than the rate of 68.81% if PSQI global score of 5 was used as the cutoff score

- Such discrepancy might reflect a under-report due to misguided association of sleep disturbances with advancing age (Chiu et al., 1999), or might be because PSQI assessed not just insomnia but a lot of sleep related behaviors.
8. Discussion

f. PSQI cutoff score

- The discrepancy may suggest a need to adjust the PSQI cutoff score for older Chinese.
- No consensus about the PSQI cutoff score was found in previous studies.
  - Buysse et al. (1989) recommended a global sum of 5 and above.
  - Carpenter and Andrykowski (1998) proposed a score of 8 to indicate poor sleep quality since their four patient groups with sleep problems had mean scores greater than 8.0.
  - Another suggestion was a global score of 6 (Backhaus, Junghanns, Broocks, Riemann & Hohagen, 2002).

- A cutoff score of **10 or above** appeared to be more appropriate for our participants, and would result in 39.8% of them classified as having some sleep problems.
8. Discussion

g. Limitations

- The sampling frame was service users of the largest NGO serving older people in Hong Kong.
- The findings could only be generalized directly to service users of elder care of this NGO, and indirectly to all service users of elder care in Hong Kong.

- Another limitation is the reliance on self-report.
- Triangulation of study methods which include both subjective and objective measures, as well as clinical and laboratory confirmation, is recommended for future research in this area.
8. Discussion

h. Recommendations for further studies

- The association between institutionalization and sleep quality and what could be done to promote sleep quality within the environmental constraints of communal living
- The relationship between depression and sleep disturbances, and the reasons behind the low level of help-seeking and low use of sleep medications
- It is important to cross-validate the exact cutoff score for older Chinese in Hong Kong as well as in other Chinese societies such as Singapore, Taiwan, and cities in Mainland China.
8. Discussion

i. Recommendations for service

- The C-PSQI is recommended for initial screening of sleep-related problems by human service professionals.
- Community education on causes, symptoms and intervention options (both pharmacological and non-pharmacological) of sleep problems is strongly recommended to the general public and the older population, especially those living in residential care homes.
8. Discussion

i. Recommendations for service

- The use of non-pharmacological and psychological intervention strategies such as sleep hygiene education, cognitive therapy, physical exercise, and an active life style might be more acceptable by the older Chinese than pharmacological intervention and should be promoted (Petit, Aza, Byszewski, Sarazan, & Power, 2003).
References


References

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