Lao language version of the Revised Hasegawa’s Dementia Scale

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ABSTRACT

With the aging of society, the number of elderly with reduced cognitive function has been increasing worldwide. As a test to measure the cognitive function, the Revised Hasegawa’s Dementia Scale (HDS-R) has been used in Japan, Korea, and China. Since there was no HDS-R version for Laotians, the questionnaire and manual were developed through the cooperation of Lao and Japanese researchers. Back-translation was conducted to confirm the accuracy of the translation. The score on the 9-item HDS-R ranges 0 to 30 points, and reduced cognitive function is usually defined as a score of 20 points or lower. After receiving explanation regarding the use of the tool and practicing its implementation, 3 female doctors interviewed 30 superficially healthy volunteers aged 31 to 84 years (12 males and 18 females) who lived with his/her family in Vientiane Capital, Lao PDR. Their score distributed from 4 to 30 points, with an average of 24.7 (standard deviation 5.4) points. Six (20.0%) participants scored 20 points or lower. The discussion before and after the pilot interviews revealed that the following changes needed to be made in accordance to the culture of Lao people; 1) order of date in Question 2, 2) words to be memorized in Questions 4 and 7, 3) objects to be memorized using pictures, not actual objects, in Question 8. Additionally, we introduced new two rules; a clear time definition for no reply (10 seconds), and repetition of questions twice for those with ear problems. The revised version of the HDS-R was thought to be an appropriate standard questionnaire for use in studies on cognitive function among Laotians.

Key Words: Revised Hasegawa’s Dementia Scale, cognitive function, Lao PDR

INTRODUCTION

Along with the aging of society, the number of elderly with reduced cognitive function have been increasing worldwide.¹² It was estimated that more than 131.5 million people would affected by dementia by 2050.³ In a study that used an adapted version of the Child Health and Nutrition Research Initiative method, this global problem was recognized as a high priority.³

In order to discuss the size of burden caused by dementia, objective methods to measure
the cognitive function are essential. The Mini-Mental State Examination (MMSE) is the most commonly used tool in the United States.\(^4\) For use with an Asian, 28 tools in seven Asian languages have recently been listed.\(^5\) Among them, MMSE, Montreal Cognitive Assessment (MoCA), Revised Hasegawa’s Dementia Scale (HDS-R), and Clock Drawing Test (CDT) were identified to be relatively common, among which only HDS-R has been developed on an Asian population sample.

Hasegawa’s Dementia Scale was developed by Kazuo Hasegawa in 1974, and it was revised (HDS-R) in 1991.\(^6\) The original HDS-R was developed in Japanese, and it was then translated in English.\(^7\) Additionally, Korean\(^8\) and Chinese.\(^9,10\) versions of the tool exist. The full score of HDS-R is 30 points. A score of 20 points or lower is considered to be an indicator of the presence of dementia. To measure cognitive function accurately, both cooperation of the examinee and the skill of examiner are necessary. Accordingly, an HDS-R manual was developed to standardize the skills of examiners.\(^7\)

Additionally, tools need to take the cultural background of the examinee into consideration. Accordingly, tools need to be adapted to fit the cultural situation of the country where the tool is applied. This article reports the development process of a Lao language version of HDS-R. Owing to the absence of a cognitive function test in the Lao language, a questionnaire and manual for the Lao language version of HDS-R were developed through cooperation between researchers of Lao PDR and Japan.

**MATERIALS AND METHODS**

*Process to translation*

The English version of the HDS-R and its manual was adopted from the paper by Imai and Hasegawa.\(^7\) This version is compatible to the original Japanese version of the tool, but a few expressions have been modified slightly to fit the language characteristics of English. The following points of the English version were further modified to fit the culture of Lao PDR, after which a pilot study was conducted.

**Question 3:** “Hospital” was replaced with “healthcare facility”, because there are several types of medical facilities in Lao PDR, such as hospital, clinic, health center, etc.

**Question 4:** “Cherry blossom,” “tram,” and “plum” were replaced with “frangipani (plumeria),” ”tuk-tuk,” and ”tamarind,” respectively.

**Question 8:** The objects to be memorized were shown with pictures, not actual objects.

**Question 9:** The explanation, “Enter in the given space the names of the vegetables the subject calls and avoid double entries. Since this question is intended to observe generating fluency, discontinue the question if the name of the first or subsequent vegetable is not called for 10 seconds. Give 0 points to 0–5 vegetable(s), and for each vegetable name after the 5th one, give to 1 point each.”\(^7\) was replaced with ”List the names of the vegetables the examinees recalls. Do not count duplicated answers. Since this question is intended to observe generating fluency, discontinue the question if the examinees cannot recall another name of vegetables for 10 seconds. Give 0 point to 0–5 name(s), then give one point for each name after the 5th one. For example, 8 names is 3 points.” (underlined for the modified words) in order to be easier to be understood.

The English version was translated into the Lao version by the Vientiane team. The Lao version was back-translated into English by two Lao researchers at Nagoya, who had no contact to the Vientiane team in the past. The back-translated English version were compared with the original English version by the Nagoya team. The differences between the original and back-
translated versions were discussed to build consensus between both teams.

**Interviewers and interviewees**

The draft of Lao version HDS-R questionnaire and manual was distributed to three female research doctors (interviewers). The background and purpose of the HDS-R were explained to them before the interview was conducted.

The interviewees were volunteers living in a community of Vientiane Capital and healthcare staff working in the community. The participants enrolled were aged 30 years or older, were superficially healthy, lives with their family, and used the Lao language. We asked the volunteers (14 persons) to visit a community hospital. We also visited a neighboring community to enroll the volunteers (16 persons). For the first 11 persons, the “day of the week” pertaining to Question 2 was not asked, confusing the “day of the week” and “the day of the date”. Accordingly, the full score for this group was 29 points.

**Revision of Lao version**

During the interviews conducted using the draft of the Lao version of the HDS-R, interviewers recorded the instances of misunderstanding of the interviewees due to the erroneous, unnecessary, or redundant instructions described in the draft manual, as well as inconvenience in the draft questionnaire. Based on the recorded comments, the three interviewers, Lao researchers, and Japanese researchers had a half-day discussion for re-examining the questionnaire and manual one by one to make revisions based on consensus.

**Ethical issues**

The purpose of the questionnaire study was explained before the interview. Consent was obtained from interviewees and/or family members. In these pilot interviews, the age, sex, and place (community hospital or their residence) were recorded in addition to the responses to the HDS-R questions. The data were collected by three female public health doctors. The dataset was made anonymously. This study was approved by National Institute of Public Health, Ministry of Health, Lao PDR, according to the rule of Lao PDR.

**RESULTS**

**Characteristics of interviewees and score**

In order to examine the applicability of the draft Lao version of the HDS-R, a wide range of interviewees were preferable, although the representativeness of population was not necessary. Table 1 shows the mean scores and standard deviations according to the age and sex of the participants. The score distributed from 4 to 30 points, with an average of 24.7 (standard deviation 5.4) points. Three persons had the full score. Those with a score of 20 points or lower were 6 (20.0%). In these pilot interviews, the average score was high in females than in males. As expected, the average score was lower in the older age groups.

**Revision of the Lao version HDS-R and its manual**

In the discussion held after these interviews, the following were pointed out, and the relevant changes were made. 1) Question 2: It is more natural to mention the question in the following order; day of the week, date, month, and year in Lao PDR. 2) Question 6: Only the explanation of having to “repeat backwards” was considered difficult to understand. Additional phrases, “for example, 3–2–1 for 1–2–3.” would be useful for interviewees to understand the meaning of the
question. The necessity to adding “(If failed, go to Question 7.)” was expressed. 3) Question 8: It was found that using the term “money” with a picture of 50,000 Kip bill (equivalent to 6 USD) would be better than using the word “coin.” Further, it was also decided that it would be better to have five pictures on one sheet than having only one picture per sheet. 4) In the draft version, it was not clear how long should the interviewer wait for the response. As a general rule, a clear criteria, i.e., 10 seconds, was fixed to ensure standardization of the wait time. To ensure consistency, the 5 seconds mentioned in Question 3 was changed to be 10 seconds. 5) For those with ear problems, it was decided that interviewers would repeat the question twice. Thus, the questionnaire and manual were revised based on the findings of the discussion.

DISCUSSION

This study reported the development process the Lao version HDS-R questionnaire and manual. Since there were no established tools to measure cognitive function in Lao PDR, this Lao version would be useful for the studies on cognitive function among those using Lao language. The process adopted in the present study, including back-translation, is a standard method used for the development of a different language version.12,13) In addition, the modification to avoid misunderstanding of interviewers and interviewees has been done. Since the other standard questionnaires have not been established in the Lao language, the comparisons of the Lao version of HDS-R with the others remains to be examined.

HDS-R is similar to MMSE. These two tools have been reported to exhibit a high correlation.8) One problem in MMSE is a question asking to read sentence and conducted as the sentence instructs, such as “close your eye”. This question doesn’t work for the illiterate people. There is no question to read letters in HDS-R, making it possible to apply this tool in areas with a high illiteracy rate.

The following are to be discussed for the Lao version HDS-R development. First is the accuracy of translation. In this study, the back-translation was used, which ensured that errors in translation would be detected. Even in the first translation, no serious errors were found. Second is the appropriateness of questions in view of the life and culture in the country. In the Japanese version, the word “cherry blossom” is used in Question 4 for the word repeating, which is not the word of daily use in Lao PDR. The items were selected by Lao researchers. Third is the easiness in the usage. In the present study, pictures of five objects were presented on one sheet in Question 8. Fourth is the standardization of interview skills. A general rule of waiting for 10 second before moving to the next question was established in the present study.

Table 1  Score mean (m) ± standard deviation (SD) of Revised Hasegawa’s Dementia Scale according to age group and sex

| Characteristics | Males | | | Females | | | Total | | |
|-----------------|-------|---|---|--------|---|---|------|---|
|                 | n     | m ± SD | n     | m ± SD | n     | m ± SD |
| Age (years)     |       |      |       |        |       |      |
| 31–49           | 0     | –    | 6     | 28.7   | 6     | 28.7  |
| 50–59           | 4     | 25.0 | 6     | 26.0   | 10    | 25.6  |
| 60–69           | 3     | 21.3 | 5     | 25.8   | 8     | 24.1  |
| 70–84           | 5     | 18.8 | 1     | 27.0   | 6     | 20.2  |
| Total           | 12    | 21.5 | 18    | 26.9   | 30    | 24.7  |

The full score of 11 interveiwees were 29, because one question on the day of the week was not asked.
Additionally, the rule of repeating the question twice for subjects with hearing problems was introduced. Through manual development and the pilot study, the skill transfer could be made to Lao research group. The last is the comparability of the HDS-R score among the different versions of HDS-R. The validation of comparability of the tool is a quite difficult problem owing to the cultural and infrastructural differences among countries.

The following were the limitations of the present study. First, the interviews with 30 co-operative volunteers might not cover the situation of complicated cases such as those of emotionally unstable or hostile elderly, although this problem is common to the other tools. In addition, since only 6 participants (20%) had a score of 20 points or lower, the problems among those with reduced cognitive function might not be detected in this pilot study. Second, this report was based on the experience of the talented doctors. In order to introduce it widely to healthcare staff, the development of another manual or of appropriate training programs might be necessary. Lastly, the repeatability of the score among the same interviewer and among the different interviewers was not measured. Neither the validity was measured. These problems remain to be the next step of the development of the Lao version.

In conclusion, a Lao version of HDS-R was developed through back-translation and a pilot study. To identify the potential problems and usefulness of this version, large sample studies need to be conducted in Lao PDR.

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COMPETING INTERESTS

The authors have declared that no competing interests exist.

REFERENCES

1) Alzheimer’s Disease International. World Alzheimer report 2015: the global impact of dementia. 2015, Alzheimer’s Disease International, London.
2) Wu YT, Brayne C, Matthews. Prevalence of dementia in East Asia: a synthetic review of time trends. Int J Geriatr Psychiatry, 2015; 30: 793–801.
3) Shah H, Albanese E, Duggan C, Rudan I, Langa KM, Carrillo MC, et al. Research priorities to reduce the global burden of dementia by 2025. Lancet Neurol, 2016; 15: 1285–1294.
4) Malloy PF, Cummings JL, Coffey CE, Duffy J, Fink M, Lauterbach EC, et al. Cognitive screening instruments in neuropsychiatry: a report of the Committee on Research of the American Neuropsychiatric Association. J Neuropsychiatry Clin Neurosci, 1997; 9: 189–197.
5) Rosli R, Tan MP, Gray WK, Subramanian P, Chin AV. Cognitive assessment tools in Asia: a systematic review. Int Psychogeriatr, 2016; 28: 189–210.
6) Kato S, Simogaki H, Onodera A, Ueda H, Oikawa K, Ikeda K, et al. Preparation of Revised Hasegawa’s Dementia Scale (HDS-R). Jpn J Geriatr Psychiatr, 1991; 2: 1339–1347 (in Japanese).
7) Imai Y, Hasegawa K. The revised Hasegawa’s Dementia Scale (HDS-R) — evaluation of its usefulness as a screening test for dementia. J Hong Kong Coll Psychiatr, 1994; 4, SP2: 20–24.
8) Jeong JW, Kim KW, Lee DY, Lee SB, Park JH, Choi EA, et al. A normative study of the Revised Hasegawa Dementia Scale: Comparison of demographic influences between the Revised Hasegawa Dementia Scale and the Mini-Mental Status Examination. Dement Geriatr Cogn Disord, 2007; 24: 288–293.
9) Kim KW, Lee DY, Jhoo JH, Youn JC, Suh YJ, Jun YH, et al. Diagnostic accuracy of Mini-mental State
Examination and Revised Hasegawa Dementia Scale for Alzheimer’s disease. *Dement Deriatr Cogn Disord*, 2005; 19: 324–330.

10) Tsai N, Gao ZX. Validity of Hasegawa’s Dementia Scale for screening dementia among aged Chinese. *Int Psychogeriatr*, 1989; 1: 145–152.

11) Wang L, Li X, Song J, Jiang T, Wu X, Zhou S. Comparisons of cognitive function and serum S-100B level between diabetic and non-diabetic patients after the implantation of carotid artery stent (CAS). *Neurosci Lett*, 2014; 570: 58–62.

12) Ida S, Murata K, Nakadachi D, Ishihara Y, Imatake K, Uchida A, *et al.* Development of a Japanese version of the SARC-F for diabetic patients: an examination of reliability and validity. *Aging Clin Exp Res* (in press).

13) Oshiro K, Nagaoka S, Shimizu E. Development of validation of the Japanese version of cognitive flexibility scale. *BMC Res Notes*, 2016; 9: 275.
### Appendix 1  Lao language version of the Revised Hasegawa’s Dementia Scale

| ลำดับที่   | คำถาม                                                                 | คะแนน |
|------------|------------------------------------------------------------------------|--------|
| 1          | "องค์ประกอบใดจะลิ้มติได้"                                                 | 0 1    |
| 2          | มีเป็นแบบด้วยมั้ย?                                                    | 0 1    |
|            | "เห็น, ยังต้องตั้งใจ"                                                 | 0 1    |
|            | "เห็น, ลดลง ไหม?"                                                   | 0 1    |
|            | "เห็น, ปีกขวา"                                                      | 0 1    |
| 3          | "ตอบถูกแบบเบื้องต้น"                                                 | 2      |
|            | ยังนั้นเบื้องต้นด้วย, ตกต่ำ, ด้านล่าง, ข้างล่าง, มีดีที่ข้างล่างมั้ย? | 0 1    |
| 4          | "ระดับความตั้งใจ ค่อนข้างตั้งใจไปบ้าง"                                | 0 1    |
|            | ใช้เป็นตอนส่วน 3 ถึง 6 A แล้ว อีก B.                               | 0 1    |
| A: (ก) เอ يังจับ, (ข) แบบ, (ค) ยังต่ำสุด                   | 0 1    |
| B: (ง) สมหขาด, (จ) ยก, (ฉ) ยังต่ำสุด                        | 0 1    |
| 5          | ลำดับอยู่แบบเบื้องต้น คุณ เช็ค 100 มีไข่ 7?                           | 0 1    |
|            | ลำดับอยู่แบบเบื้องต้น คุณ เช็ค ลำดับที่ 5 มีไข่ 7?                 | 0 1    |
| 6          | "ระดับของความสัมพันธ์ที่มีความรู้สึกอย่างต่ำสุด 3-2-1 ไข่เจ็บ 1-2-3" | 0 1    |
|            | "ระดับของความสัมพันธ์ 6-8-2 ไข่เจ็บที่จะทำ" (ครั้งที่เจ็บไข่เจ็บ 7) | 0 1    |
|            | ถ้าจะตอบแล้ว "ระดับของความสัมพันธ์ "3-2-9." ไข่เจ็บที่จะทำ"        | 0 1    |
| 7          | "ระดับของความสัมพันธ์ที่มีการตอบแบบยืดหยุ่นไข้เจ็บที่จะตอบยกนิ้ว" | 0 1 2  |
|            | "ปักใหญ่นิ้วมือแบบบอย?"                                             | 0 1 2  |
|            | "ทุกส่วนของ นิ้วมือแบบบอย?"                                        | 0 1 2  |
|            | "ยืนสูงขึ้น ยกท้องแบบสม่ำเสมอแบบบอย?"                               | 0 1 2  |
| 8          | "ถ้าอย่าจะมีสูงสุด 5 อับ ไข่เจ็บปุ๊บ และ จะตื่นตึง จากมันไปจนเจ็บแบบแข็งๆ | 0 1 2  |
|            | แต่จะตอบแบบเคย.                                                   | 3 4 5  |
| 9          | "ระดับของความสัมพันธ์ 10 ละมี ไข่เจ็บเต็ม exhaustion"             | 0 1 2  |
|            | (ก) (ข) (ค) (ง) (จ) (ฉ) (ช) (ซ) (ฌ) (ญ) (ฎ) (ฏ) (ฐ) (ฑ) (ฒ) (ณ) (ด) (ต) | 3 4 5  |

คะแนนรวม: __/30
Appendix 2  Manual for Lao language version of the Revised Hasegawa’s Dementia Scale
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Lao version of HDS-R