CORNELL MEDICAL INDEX: A COMPARATIVE STUDY ON HEALTH PROBLEMS AMONG THAI AND JAPANESE NURSING STUDENTS

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Abstract. Cross cultural differences in subjective physical and psychological health problems reported on the Cornell Medical Index (CMI) Thai and Japanese versions were conducted among Thai and Japanese female first year class nursing students from two nursing colleges. All of the Thai (114) and 96.2% (102) of the Japanese subjects self- administered the CMI. The internal consistency reliability of each CMI was acceptable. Mean ages of the Thai and the Japanese subjects were 19.3 (SD = 0.8) and 18.4 (SD = 0.5) years respectively, which was not significantly different. Mean CMI for the physical, psychological and overall health complaints of the Thai subjects were 29.8 (SD = 13.5), 14.5 (SD = 8.0), and 41.3 (SD = 19.3) respectively, and those for the Japanese subjects were 15.7 (SD = 11.8), 7.3 (SD = 6.1), and 23.1 (SD = 15.9) respectively, which were significantly different. Findings indicate that the Thai nursing students have more health problems than the Japanese subjects. These mostly concerned respiratory, cardiovascular, digestive, musculoskeletal, nervous, genitourinary systems, fatigability, frequency of illnesses, miscellaneous diseases, mood and feeling patterns, sensitivity, anger and tension. The only one section that the Japanese reported significantly higher health problems than the Thai subjects concerned daily living habits pertaining to questions concerning such matters as dringking, smoking, exercise, sleeping and rest. Percentages of emotional disturbances or neurotic tendencies of the subjects using the conventional CMI score and the Fukamachi criteria are discussed.

INTRODUCTION

Health personnel are important for health care services. The nurse is on of those who serves not only by providing nursing care but also preventive care and rehabilitation. Hence, the quality of the health of nursing students has become a very important factor in health care services development. The quality of health can be assessed not only by an objective health index but also by a subjective health index (Sato *et al,* 1991).

Mental health problems are increasingly prevalent among nursing students studying in the central part of Thailand and certain parts of Japan (Poolcharoen *et al,* 1987; Sakamoto *et al,* 1986).

This study describes subjective physical and psychological health problems reported on the Cornell Medical Index Health Questionnaire (CMI) by Thai nursing students and compares these to Japanese nursing students.

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MATERIALS AND METHODS

Research instruments were the Cornell Medical Index Health Questionnaire Thai version (abbre viated T-CMI) and Japanese version (J-CMI). They are described elsewhere (Nanakorn *et al,* 1997; Fukahara *et al,* 1997). In brief, the CMI is a self-administered health questionnaire which was originally developed in the United States as an aid to the clinician (Brodman *et al,* 1949, 1996). It has been translated into several languages and widely used as a valid screening tool for a sensitive indicator of a person's health and neurotic tendencies among countries including Thailand and Japan (Brodman *et al,* 1952; Sudharatna *et al,* 1979; Nanakorn, 1989; Kanehisa and Fukamachi, 1988). It consists of 195 simply worded questions pertinent to physiological symptoms, past illnesses, family health histories and emotional symptoms which

are grouped into 18 sections (section A to R). The section A-L, hereafter termed physical health complaints contains 144 questions pertinent to physical symptoms related to physiological systems including medical and family's health history and habits. The section M-R; hereafter termed psychological health complaints, contains 51 questions pertinent to mood and feeling patterns. Yes-or no-response to each question scores as one point or zero, respectively. A yes-response answer indicates an individual's currently or previously occurring symptoms (Brodman *et al,* 1949).

An individual's CMI score is determined by the sum total of yes-responses over the entire questionnaire. Mean CMI for a population is a product of the accumulated individual's CMI score divided by the total number of subjects.

The T-CMI has been published in the public domain (Sudharatna *et al,* 1979; Nanakorn, 1989). The J-CMI has been available and widely used in Japan for screening emotional disturbances in the mass population and is commonly used in clinical practice as a screening procedure to evaluate neurotic tendencies (Kanehisa and Fukamachi, 1988).

The subjects for this comparative study were female university students obtained from two different surveys. One group was Thai nursing students in the first year-class of a college of nursing located in northeastern Thailand, the other group was Japanese nursing students in the first year-class of a school of nursing located in Kyushu, southern Japan. All of the Thai (114) and the Japanese subjects (106) were instructed to honestly self-administer the T-CMI and J-CMI, respectively. All of the Thai and 96.2% (102) of the Japanese subjects completed the questionnaires.

Data analyses were conducted using the SAS statistical package at the Computer Center, Kurume University School of Medicine, Japan. Cronbach's alpha and Pearson's product moment coefficient (r_p) were calculated from each data set to obtain the internal consistency reliability of the T-CMI and the J-CMI. Correlations between the CMI scores and demographic variables were assessed by Pearson's product moment coefficient. Chi-square was performed for testing statistical significant difference of the Thai and the Japanese subjects who reported CMI scores over the recommended cutoff point. Unpaired *t*-tests based on equal and unequal variances as appropriate were analyzed to compare statistical significant differences between mean CMI of both subject groups (Armitage and Berry, 1994; SAS Institute Inc, 1990). Calculating the 5% level was used to detect statistical significance.

RESULTS

Demographic characteristics

Mean ages of the Thai and the Japanese subjects were 19.3 (SD = 0.8) and 18.4 (SD = 0.5) year, with age range between 17-22 and 18-12 years, respectively. The numbers of siblings were an average of 4.5 (SD = 1.9) for the Thai and 2.4 (SD = 0.6) for the Japanese subjects, ranging from 1-10 and 1-4 persons, respectively.

There was a significant difference in the number of siblings between the Thai and the Japanese subjects, but in respect to age.

For the Thai subjects, there were no significant correlations between the demographic variables and the CMI scores. For the Japanese subjects, physical health complaints significantly correlated with age ($r_p = 0.21$) and inversely correlated with the number of siblings ($r_p = -0.20$).

Reliability of the CMI

The internal consistency of the CMI, the extent of homogeneity among the items or subparts (Goodwin, 1997; Knapp, 1985) assessed by Pearson's product moment correlation coefficient (r_p) between the CMI scores of entire questionnaire (CMI total score), to its grouped sections (section A-L, and section M-R) and to each section (section A to R), emerge as internally consistent with the Cronbach's alpha = 0.92, and 0.89 for the T-CMI and the J-CMI, respectively. The T-CMI had a high correlation between the CMI total scores and both of its grouped sections ($r_p = 0.94$, and 0.82, respectively). Similarly, the J-CMI showed a high correlation ($r_p = 0.94$, and 0.78, respectively). The correlations (r_p) were significant between the CMI total scores and section A to R ranging from 0.22 to 0.78 for the T-CMI and 0.42 to 0.74 for the J-CMI. Thus, the T-CMI and the J-CMI exhibited acceptable reliability.

Comparative CMI score and mean CMI

The individual's CMI total score (hereafter termed overall health complaint) reported by the Thai subjects ranged from 1-110 with an average of 41.3 (SD = 19.3), and for the Japanese subjects was 2-108 with an average of 23.1 (SD = 15.9). In another words, the mean CMI for the overall health complaints of the Thai and the Japanese nursing students were 41.3 and 23.1, respectively.

Mean CMI for physical and psychological health complaints of the Thai subjects were 29.8 (SD = 13.5) and 14.5 (SD = 8.0), respectively, and for the Japanese subjects were 15.7 (SD = 11.8) and 7.3 (SD = 6.1), respectively. The umpaired *t*-test revealed staistically significant differences between mean CMI for the overall, physical and psychological health complaints among the Thai and the Japanese subjects (Fig 1).

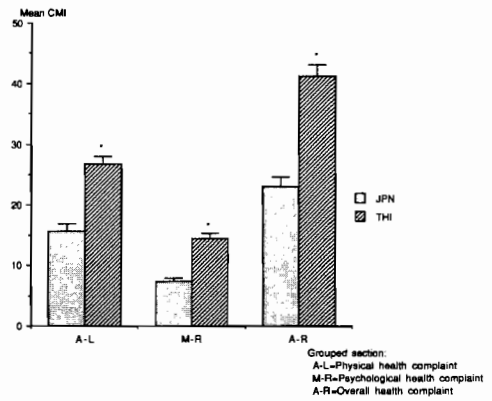

Fig 1–Mean CMI for physical, psychological and overall health complaints among Thai and Japanese nursing students: *p < 0.05.

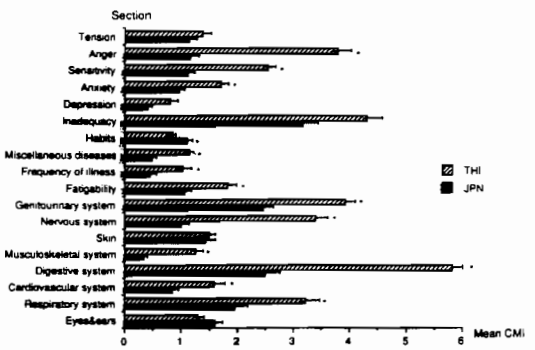

Fig 2–Mean CMI for each section among Thai and Japanese nursing students: *p < 0.05.

Comparative pattern of complaints

Fig 2 shows mean CMI by section among the Thai and the Japanese nursing students. The unpaired *t*-tests showed that the Thai subjects reported mean CMI for nearly all sections significantly higher than those of the Japanese subjects. However, Japanese subjects obtained significantly higher mean CMI for section L (habits). The physical health complaints concerning skin, eye and ear systems and the psychological health complaints concerning inadequacy, depression, and tension among the Thai and the Japanese subjects were not significantly different.

If the CMI question gave a yes-response from over 50% for both the Thai or the Japanese subjects, it should be considered as a common specific health problem and there would be some questions such as; 'usually eats sweets between meals,' concerning digestive system (64.9% and 63.7%); 'menstruation causes pain,' concerning genitourinary system (74.6% and 59.8%); 'impossible to take regular daily exercise,' concerning habits (50.9% and 42.2%); 'always wish someone was nearby for advice,' concerning inadequacy (63.2% and 54.9%). Moreover, there were several questions that gave responses of over 50% of the Thai subjects but much lower for the Japanese. These were: 'stomach trouble occurs in family,' (55.3% and 13.7%); ' constant suffering from bad constipation,' (55.3% and 11.8% 'very sensitive or tender skin,' (51.8% and 14.7%) 'pressure or pain in the head often makes life miserable,' (65.8% and 14.7%); 'feeling tense or jumpy with menstrual pain,' (70.2% and 36.3%); 'often trouble with vaginal discharge,' (61.4% and 38.2%); 'work falls to pieces when boss or superior is watching,' (52.6% and 12.7%); 'must do things very slowly in order to not make mistakes,' (53.5% and 39.2%); 'worrying continually gets me down,' (64.0% and 9.8%); 'feeling easily hurt,' (54.4% and 22.5%); 'criticism always makes me upset,' (74.6% and 30.4%); and 'goes to pieces if do not constantly self-control,' (61.4% and 0.0). The highest percentage of yes-responses were to the questions 'criticism always makes me upset,' and 'menstruation causes pain,' for the Thai subjets and 'needs glasses to see things at a distance,' for the Japanese (67.6%, which was only 21.9% among the Thai subjects).

Comparative psychological health complaints

According to the conventional recommended

use of the CMI total score > 30 or M-R score > 10 as a cutoff point for indicating degree of emotional disturbances (Brodman *et al,* 1952), there was higher percentage (67.5%) for the Thai nursing students with emotional disturbances or psychological health problems than for the Japanese (29.4%, $\chi^2 = 39.1$, df = 2, Table 1). When applying the CMI M-R score, approximately two thirds of the Thai nursing students exhibited psychological health problems comparing to about one third of the Japanese subjects, which was significantly different ($\chi^2 = 28.3$, df = 1, Table 1).

DISCUSSION

In this comparative study of the same year-class Thai and Japanese nursing students, age was found to be correlated with the physical health complaint for the Japanese subjects only. It has also been described in other populations (Brodman *et al,* 1953; Abramson *et al,* 1965) in accordance with the clinical observation that, as individuals grow older, they develop more disabilities and complain more about their bodies.

Table 1

Comparative percentage of psychological health problems using conventional recommend cutoff CMI. score.

Cutoff CMI score	Thai (n = 114)	Japanese (n = 102)	Chi-square
Total score:			
≤ 30	32.7	70.6	39.1*
31-49	34.2	24.5	
≥ 50	33.3	4.9	
M-R score:			
≤ 10	33.3	69.6	28.3*
> 10	66.7	30.4	

* $p < 0.05$

Table 2

Cross-cultural comparison of mean CMI.

Country/study population	No. of subjects	Gender	Mean CMI ± SD
Thailand			
university students[1]	108	both sexes	41.7 ± 23.7
school children[2]	105	both sexes	46.2 ± NA
air-hostesses[3]	100	both sexes	42.1 ± 21.1
retired government officers[4]	213	both sexes	35.6 ± 249
nursing students[5]	405	female	NA
nursing students[6]	513	female	36.6 ± 18.6
nursing students[present study]	114	female	41.3 ± 19.3
Vietnam:			
refugees[7]	152	both sexes	34.0 ± NA
Japan:			
woment college students[8]	109	female	NA
nursing students[9, and present study]	102	female	23.1±15.9

[1] Sudharatna *et al,* 1979; [2]Charthananon, 1978; [3]Tasananchali *et al,* 1986; [4]Pataranit, 1986; [5]Poolcharoen *et al,* 1987; [6] Nanakorn *et al,* 1997; [7]Lin *et al,* 1979; [8]Sakamoto *et al,* 1986; [9]Fukahara *et al,* 1997; SD = standard deviation, NA = not available

The comparative mean CMI of the entire questionnaire (section A-R, or overall health complaints) and the grouped sections (section A-L, M-R, or the physical and the psychological health complaints, respectively) of the Thai subjects were significantly higher than those of the Japanese subjects,which implies that the Thai subjects have more health problems both in the overall, physical, and psychological aspects, possibly because of cultural differences in life style and way of thinking.

Table 2 shows a cross cultural comparison of mean CMI for a variety of groups and countries. It can be seen that the Thai groups have a relatively high mean CMI compared with the Vietnamese and the Japanese (but the Vietnamese group were not, however, specifically students).

The reason for given the highest yes-response among the Japanese subjects on 'needs glasses to see things at a distance,' is possibly an improper eye use for reading or amusement since childhood. The reason for most of the Thai subjects who were always upset because of criticism, was harder to explain. It probably has been caused by Thai culture where criticism is not readily acceptable.

It should be noted that, there were very high percentages (66.7-67.5%) for emotional disturbances among the Thai subjects compared to 29.4-30.4% for the Japanese subjects when using either the CMI total or M-R scores. It is unlikely that two thirds of the Thai nursing students tend to have emotional disturbances, though it was found to be similar for the nursing students of a school of nursing in Bangkok studied by Poolcharoen *et al* (1987). The high percentage of emotional disturbances indicates that the CMI is a very sensitive tool for screening purposes.

Considering the criteria used in the classification of neurotic tendencies, there was the Fukamachi's criteria (Fukamachi, 1959) which was developed and validated for use with the CMI Japanese version, while no such criteria has been developed for using with the CMI Thai version. In the same study population of Japanese nursing students, only 10.8% were classified as having neurotic tendency using Fukamachi's criteria (Fukahara *et al,* 1997). This proportion seems to be consistent with the study by Sakamoto *et al* (1986) which found 16.2% of the 19-year Japanese female college students had such problems. It can be seen that using the criteria developed in the USA gave a higher proportion of neurotic tendencies (Table 1). The authors have cautioned the interpretation against using norms developed for data from western cultures which is mentioned also in Kalimo and Bice (1970), and Lin *et al* (1979).

Though, the CMI has been proved to be valid in cross-cultural settings and the reliability in terms of internal consistencies of the T-CMI and the J-CMI have been tested as satisfactory for this comparative study, the present findings have provided grounds for caution in using criteria which were developed for a different cultural population. Further studies should attempt to obtain validation of the CMI in different cultural settings, over time with different environments and cultures.

However, the CMI is useful for a measure of the amount and type of medical complaints. Such data may have both the anthropological interest and significance for the planning and provision of health care services to the students.

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