PSYCHOMETRIC PROPERTIES OF THE THAI VERSION OF COPENHAGEN BURNOUT INVENTORY (T-CBI) IN THAI NURSES

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ABSTRACT:

Background: Burnout has consistently been an influential predictor of intention to leave nursing profession. Assessing nurses' burnout is highly crucial in retaining qualified nurses and alleviating nursing shortage. The Copenhagen Burnout Inventory was originally developed in English and has been modified and translated into Thai. Psychometric properties of the Thai version of Copenhagen Burnout Inventory has not been investigated.

Methods: The purpose of study was to examine psychometric properties of the Thai version of Copenhagen Burnout Inventory (T-CBI). The T-CBI is a self-reported questionnaire that consists of 19 items with five response categories. It contains three dimensions: personal burnout, work-related burnout, client-related burnout. The 207 registered nurses working in governmental hospitals of Bangkok Metropolitan in Thailand were recruited using random sampling approach. Statistical analyses included confirmatory factor analysis and measures of descriptive statistics, item analysis, criterion validity, internal consistency, and test-retest reliability.

Results: The T-CBI demonstrated good reliability and validity. Cronbach's alpha coefficient was 0.96. Corrected item-total correlations for the total scale were positive (range from 0.33 to 0.82). Construct validity was supported by confirmatory factor analysis. Results indicated that criterion related validity was well correlated with a previously validated measurement.

Conclusion: The test results indicated the T-CBI scale appear to be a reliable and valid instrument. It has potential benefit for assessing burnout among Thai nurses. The current findings should be of benefit for nurse administrators and policy makers, to assess burnout among nurses that could develop strategies in retention and prevent qualified nurses from leaving the profession.

Keywords: Registered nurse, Burnout, Intention to leave nursing profession, Psychometric properties

INTRODUCTION

Burnout is a persistent negatively work-related state of mind in individual which primarily characterized by exhaustion [1] and relatively common affects to the chronic stress in human service occupation [2, 3]. Nursing is one of the occupations that presented the highest burnout prevalence rates [4]. High levels of burnout among healthcare professionals have been well-documented. More than 40% of hospital nurses have the high range of score for burnout [5, 6]. Nurses in particular however, have been found to susceptible in developing burnout because of confronted incessantly with a high level of demands and insufficient resources linked to the work itself within the profession [7]. The job demands in nursing also include role ambiguity, role conflict, work overtime, work overload, work-family conflict, inadequate salaries, lack of opportunities for advancement, lack of support, and staffing [8, 9]. The previous studies showed that the effects of burnout are wide-ranging.

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Its consequences are not only effect for the individual personally and professionally but also for quality of patient care and healthcare workforce.

As this concern, previous empirical study indicated that burnout has strong evidence that contribute to intention to leave nursing profession and turnover [10, 11]. To address burnout among professional nurse is significant because burnout not only creates a problem for individual health care profession but also for client and for the organization at large. Given well document on these findings could suggest deep understanding for early detection of significant symptom of burnout to protect health care profession from negative effects of burnout. Therefore, developing a valid and reliable measure of burnout is the first step for burnout detection.

In the purpose to assess burnout, the existing knowledge demonstrated that the Maslach Burnout Inventory (MBI) is recognized as a "gold standard" and popular using to assess professional burnout; it has been extensively applied in more than 90% of all empirical burnout studies [12, 13]. However, there are many arguments on the MBI that the depersonalization dimension has been associated coping strategy rather than an essential part of the syndrome, and (lack of) personal accomplishment appeared to be in the process of being relegated to the status of a possibly associated coping strategy, and found to have a weak association with the emotional exhaustion and depersonalization dimensions in the investigation on the causes and consequence of burnout. Therefore, it should not be combined into a single score [14-17]. Additionally, several authors stated that the limitation of the MBI is considering only emotional exhaustion aspect, rather than the physical and cognitive aspects [18-20]. Therefore, the Copenhagen Burnout Inventory (CBI) is a new instrument that was developed by emphasized on prolonged physical and psychological exhaustion features [14]. The CBI was developed in focusing on exhaustion and comprised of three specific domains in the person's life which is general exhaustion, exhaustion attributed to work in general, and exhaustion attributed to work with clients. Therefore, this study selected the instrument to conceptualize burnout based on fatigue and/or exhaustion as a central construct.

In order to ensure the high quality of patient care is provided and prevent negative impact of burnout, nurse leaders should be aware the predisposing nurses' burnout. A comprehensive understanding of nurses' burnout could provide evidence for planning strategies to deal with this issue. It is necessary to establish a psychometrically sound instrument to assess burnout among Thai nurses. However, there is a paucity of validity and reliability evaluation of the Thai version of Copenhagen Burnout Inventory. Therefore, the purpose of this study has attempted to evaluate psychometric properties of T-CBI that appropriate to assess burnout among Thai nurses. Given the well documented on this, is important to protect nurses from burnout and adverse effects of this persistent phenomenon in health care settings.

METHODS

The study is a part of main study namely "factors influencing intention to leave nursing profession among registered nurses, governmental hospitals" that conducted by researcher. This study has a purpose to examine the psychometric properties of the Thai version of Copenhagen Burnout Inventory (T-CBI). The survey was randomly in three governmental hospitals of Bangkok Metropolitan in Thailand providing tertiary care with greater than 500 beds during September to November in 2014.

Participants

Regarding determining the minimum sample size for factor analysis, a ratio of 5-10 participants per item was required to reduce sampling error [21, 22]. Two hundred and seven registered nurses from 3 governmental hospitals were randomly selected from 12 hospitals in Bangkok Metropolitan. After obtaining the Intuitional Review Board's approvals of the study hospitals, all full time registered nurses were eligible and invited to participate in this study with exclusion of newly nurses employed less than three months because first three months is a transition period for new nurses usually has high experienced in stress and burnout, nurses those are on maternity leave, extended sick leave or study leave, and unwilling to participate in the study.

Instruments

The CBI was used to assess burnout [14]. The CBI was developed in focusing on exhaustion and comprised of three specific domains in the person's life which is general exhaustion, exhaustion attributed to work in general, and exhaustion attributed to work with clients. The CBI has three different subscales that are: (1) the personal burnout subscale; contains six items; which is a general exhaustion corresponding to the general exhaustion concept that applies to everyone in and out of the workforce; (2) the work-related burnout subscale; comprises seven items; that described on symptoms of exhaustion related to work and applies to everyone in the workforce; (3) the client-related burnout subscale is

based on six items of symptoms' exhaustion which applicable only to people who work with clients. All items have five response categories. The categories were: "never/almost never", "a few times a month", "once or twice a week", "three to five times a week" and "(almost) every day". However, according to the existing literature; there is no Thai version of the CBI complied with the soundness psychometric testing and translation method. Regarding conceptual integrity and psychometric strength, the CBI was decided to be appropriate for this study.

The Thai version of the CBI was translated and modified from the original version of CBI. After obtaining the author's permission, forward (English to Thai) and backward (Thai to English) translation was applied according the Brislin's translation guideline [23] through two independent linguistic experts who working at translation and interpretation service unit, Faculty of Arts, Chulalongkorn University. Firstly, the translation process initiates by translating the original English version of the instrument into Thai language. Secondly, another independent translator has been undertaken back-translation for reaching congruence of meaning between the original and target versions in Thai. The back-translated versions are compared with the original (English language) versions. Then, the investigators and linguistic expert nurses with a PhD in Nursing compared both versions in the original language, conducted checks with the translators to examine and modify these items with apparent discrepancies in translation, wording and grammar, and produced a final consensus version. Finally, the instruments were acceptable and reflect the meaning of each item. After this, the final of Thai version is achieved and translation validity had been established.

Five nursing experts with Master's or PhD degree in nursing administration field performed content validity. The five experts rated each items of the T-CBI on a four-point scale that will reflect relevance to the construct of the study (1= not relevance, 2= somewhat relevance, 3= quite relevance, 4= very relevance) and clarify the items using open suggestions. The content validity index (CVI) was calculated. The acceptable score are equally or higher .80 [24]. The result of CVI of T-CBI was 1.00.

Ethical considerations

This study was approved by 1) the Ethical Review Committee for Research Involving Human Research Subjects, Health Sciences Group, Chulalongkorn University (ECCU) (no.001/2015), 2) Institutional Review Board, Faculty of Medicine, Chulalongkorn University (no320/57), 3) the Ethical

Review Committee, Nopparat Rajathanee Hospital (no.23/2557), and 4) the Ethical Review Committee, Police General Hospital (no.47/2557). Permission for collecting the data was gathered by formal approval from the hospitals to conduct the study. The eligible nurses who agreed to participate in this study were informed that study participation was voluntary and they could refuse or withdrawal from the study at any time without any affected to them. Data were computerized and accessible only by researcher and results of the study were reported as a whole picture.

Data collection

After obtaining formal approval of permission to collect the data from the hospital directors and nursing departments, nurse coordinators or head nurses of each hospitals distributed a survey packages to the participants whose gathering by using purposive sampling approach. A survey packages, including participant information sheet, informed consent, and packet of the questionnaires were administered to all eligible nurses in the study. The participants were received the information about the purpose of the study, benefits, risks, the types of questionnaires and tasks to be completed, and the length of time to complete the questionnaires before giving written informed consent. After completed the questionnaire anonymously, nurses sealed their questionnaire and return to nurse coordinators or head nurses, and lastly return them to researcher. A total of 207 of 220 (94.1%) questionnaires were determined to be usable for analysis. For test-retest reliability, nurses were retested within 2 weeks after the first test.

Data analysis

Psychometric properties were computed by using SPSS version 17.0 and LISREL version 8.53 statistical packages. The reliability of total scale and subscale was evaluated by the following: a) Cronbach's alpha coefficient that estimates the internal consistency. The acceptable score of Cronbach's Alpha Coefficient is 0.80 or higher [25]; b) Test-retest reliability is used to test stability that concerns on how constant scores remain on repeat administration of the instrument to the same sample [22]. Two time testing were calculated using the interclass correlation coefficient (ICC). The acceptable score of ICC is above 0.70 [26]; c) corrected item-total correlation, with low item-total correlation ($r < 0.30$); items were deleted. Construct validity was established by confirmatory factor analysis (CFA) technique. The CFA is used to assess the overall goodness of fit, the chi-square test and the normed fit chi-square was used (indicates a good fit when values of less than three are achieved); the RMSEA

Table 1 Demographic Characteristics of Participants (n=207)

Characteristics	n (%)
Age (years)	
< 30	66 (31.9)
30-39	68 (32.9)
40-49	52 (25.1)
≥ 50	21 (10.1)
Mean (SD)	36.0 (9.5)
Gender	
Female	202 (97.6)
Male	5 (2.4)
Education	
Bachelor	166 (80.2)
Master	39 (18.8)
Doctoral	2 (1)
Work experience	
< 5 years	55 (26.6)
5-10 years	33 (15.9)
11-20 years	64 (30.9)
> 20 years	55 (26.6)
Marital status	
Single	128 (61.8)
Married	77 (37.2)
Divorced	2 (1)
Salary (THB)	
Mean (SD)	23,392.8 (8569.7)
Employment status	
Government officer	127 (61.4)
Temporary employee	9 (4.3)
Public organization employee	71 (34.3)
Work unit	
Surgical	53 (25.6)
Medical	50 (24.2)
Intensive care	37 (17.9)
OBS-GYN	21 (10.1)
OPD & ER	16 (7.7)
Other (Ped., OR, Ortho, Anest)	30 (14.5)

(<0.05) (indicates a good fit when values of <0.05 are achieved); the Comparative Fit Index (CFI) (displays a range of 0–1, with a minimum goodness-of-fit value of 0.95) and finally the Standardized Root Mean Square Residual (SRMR) (indicates a good fit with values of <0.08) [27]. The content validity of the T-CBI was examined by Pearson correlation coefficients between mean scores of items and overall mean scores. Criterion related validity of T-CBI was test against the MBI of Thai version which has been previously validated, as a concurrent criterion. Pearson's correlation coefficients between the total mean score of the T-CBI scale and the MBI were established.

RESULTS

Demographic data

The majority of participants were female (n= 202, 97.6%), and had age between 30-39 years (n = 68, 32.9%). The mean age was 36.04 years (SD = 9.59, range = 21-56 years). The most of participants graduated in bachelor degree (n= 166, 80.2%), whereas work experience between 11-20 years was 30.9% (n = 64). The most of participants were single (n = 128, 61.8%). The mean salary was 23,392.8 THB (SD = 8569.7). Government officer was the majority group of employment status (n = 127, 61.4%). The most of nurses were working at surgical (n = 53, 25.6%) and medical unit (n = 50, 24.2%), respectively, Table 1.

Reliability of the T-CBI

The Cronbach's alpha coefficient for total scale was 0.96. The Cronbach's alphas of the three subscales are 0.91, 0.93, and 0.88, respectively. These were indicated good internal consistency. All item-total correlations for the total scale were positive (range 0.33-0.82) within the criterion of the item-total correlation greater than 0.30 [22]. The

Table 2 Interclass correlation of the T-CBI, subscales and items

Variables	Interclass correlation coefficient	95% CI		P-value
		Lower	Upper	
T-CBI	.86	.80	.92	< .001
Subscales				
Personal burnout	.82	.73	.88	< .001
Work-related burnout	.83	.74	.89	< .001
Client-related burnout	.80	.71	.87	< .001
Items				
1. Feel tired	.77	.66	.85	< .001
2. Physically exhausted	.74	.61	.83	< .001
3. Emotionally exhausted	.76	.65	.84	< .001
4. Can't take it anymore	.76	.64	.84	< .001
5. Feel worn out	.75	.63	.84	< .001
6. Feel weak and susceptible to illness	.73	.61	.82	< .001
7. Work emotionally exhausted	.71	.57	.81	< .001
8. Feel burnt out because of work	.74	.62	.83	< .001
9. Work frustrate you	.78	.68	.86	< .001
10. Feel worn out at the end of working day	.76	.64	.84	< .001
11. Exhausted in the morning at the thought of another day at work	.71	.58	.81	< .001
12. Feel every working hour is tiring	.75	.64	.84	< .001
13. Have not enough energy during leisure time	.68	.54	.79	< .001
14. Hard to work with clients	.62	.46	.75	< .001
15. Frustrating to work with clients	.74	.61	.83	< .001
16. Drain energy to work with clients	.73	.60	.82	< .001
17. Feel that you give more than you get back when work with clients	.67	.53	.78	< .001
18. Feel tired of working with clients	.80	.70	.87	< .001
19. Wonder how long you will be able to continue working with clients	.78	.67	.86	< .001

total scales mean score was 52.71 (SD 14.05). The mean of inter-item correlations was 0.54 with values ranging from 0.18-0.82. The reliabilities of the three subscales were acceptable. Furthermore, the Interclass Correlation Coefficient (ICC) is used to assess the consistency of measurement made in two different times measuring the same quantity (test-retest approached). For an overall mean score was 0.86 (CI 95%: 0.80-0.91). ICC values for each one of the three subscales of the T-CBI were: personal burnout: 0.82 (CI 95%: 0.73-0.88); work-related burnout: 0.83 (CI 95%: 0.74-0.89); and client-related burnout: 0.80 (CI 95%: 0.71-0.87). All subscales had an ICC greater than 0.70, which indicated high stability within 2 weeks, Table 2.

The corrected item-total correlation for all items achieved values higher than .30 (Table 3). All items contributed to increase the internal consistency of the scale. The lowest mean values were obtained by item "How often do you find it frustrating to work with clients?" (M = 2.23, SD = 0.87), which belongs to the client-related burnout subscale. The highest mean obtained by item "How often do you feel tired?" (M = 3.42, SD = 0.87), which belongs to the personal burnout subscale.

Criterion validity of the T-CBI

To estimate the validity associated to the criterion, the concurrent validity of the two burnout instruments was tested to measure similar construct. Pearson's correlation coefficients between the mean score of T-CBI and the Maslach Burnout Inventory (MBI) were established in concurrent validity analysis. The result showed that the T-CBI score was significantly positively correlated with the MBI score at moderate level ($r = .51$, $p < .01$).

Construct validity of the T-CBI

The confirmatory factor analysis (CFA) which used to evaluate the measurement of psychological constructs was done to examine whether a particular factor model provided a good fit to the data. It provides construct validity evidence of self-reporting scales. The results of the CFA showed regression weights of three dimensions ranging from 0.81 to 1.00 ($p < 0.01$). Most of the model's fit indices were acceptable (e.g., the goodness-of-fit index (GFI) = 0.90, comparative fit index (CFI) = 0.99, parsimony normed fit index (PNFI) = 0.76, root-mean-square error of approximation (RMSEA) = 0.05), standardized root mean square residual

Table 3 Descriptive statistics of T-CBI items

Subscale item	M (SD)	Item-Total correlations	Alpha if item deleted
Personal burnout			
1. Feel tired	3.42 (.87)	.75	.95
2. Physically exhausted	3.18 (.96)	.77	.95
3. Emotionally exhausted	3.15 (.94)	.68	.95
4. Can't take it anymore	2.41 (.99)	.70	.95
5. Feel worn out	2.85 (.93)	.78	.95
6. Feel weak and susceptible to illness	2.43 (.96)	.70	.95
Work-related burnout			
7. Work emotionally exhausted	2.92 (.95)	.79	.95
8. Feel burnt out because of work	3.05 (.99)	.82	.95
9. Work frustrate you	2.95 (.97)	.73	.95
10. Feel worn out at the end of the working day	3.09 (.96)	.77	.95
11. Exhausted in the morning at the thought of another day at work	2.88 (1.07)	.80	.95
12. Feel that every working hour is tiring	2.49 (.99)	.77	.95
13. Have not enough energy during leisure time	2.71 (1.18)	.68	.95
Client-related burnout			
14. Hard to work with clients	2.36 (.92)	.72	.95
15. Frustrating to work with clients	2.23 (.87)	.71	.95
16. Drain energy to work with clients	2.39 (.97)	.75	.95
17. Feel that you give more than you get back when work with clients	3.15 (1.22)	.33	.96
18. Feel tired of working with clients	2.50 (.91)	.74	.95
19. Wonder how long you will be able to continue working with clients	2.56 (1.05)	.70	.95

Table 4 Fit indices of the factors structure of the T-CBI (n=207)

Goodness-of-fit statistics	Threshold values	Studied value
Chi-square ($\chi2$)	p >0.05	p=0.00
Normed chi-square ($\chi2/df$)	<3.00	1.56
Goodness-of-fit index (GFI)	>0.90	0.90
Root-mean-square error of approximation (RMSEA)	<0.05	0.05
Standardized Root Mean Square Residual (SRMR)	<0.08	0.04
Comparative Fit index (CFI)	>0.90	0.99
Parsimony Normed Fit Index (PNFI)	>0.60	0.76

The level of significant was set at the 0.01 level (2-tailed)

(SRMR) = 0.04, except for chi-square significance (*P-value* = 0.01) as shown in Table 4. The final model of the T-CBI is illustrated in Figure 1.

DISCUSSION

The purpose of this study was to examine the psychometric properties of Thai version of CBI. This study provides evidence showing the adequate psychometric properties of an alternative burnout measurement. The final version of T-CBI is a self-reported questionnaire that consists of 19 items with five response categories. It contains three dimensions: Personal burnout, Work-related burnout, Client-related burnout. The corrected item-total correlation values obtained for the items (range from 0.33 to 0.82) are relatively high, which demonstrated that the items of T-CBI are relative homogeneous and are measuring the same overall construct. The ICC analysis showed that the three subscales had high stability within 2 weeks of test-retest approached. The internal consistencies of the three subscales were satisfactory, with all the Cronbach's alpha ranging from .88 to .93. These results are reported higher than the previous study of Kristensen et al. [15] that the Cronbach's alpha ranged from .85 to .87. These results are presented good internal consistency values in present study.

Concurrent validity of the T-CBI was obtained through the relationship with the parallel subscales from the MBI. The Pearson correlations were moderate and acceptable, which implies that the theoretical construct of burnout estimated by the
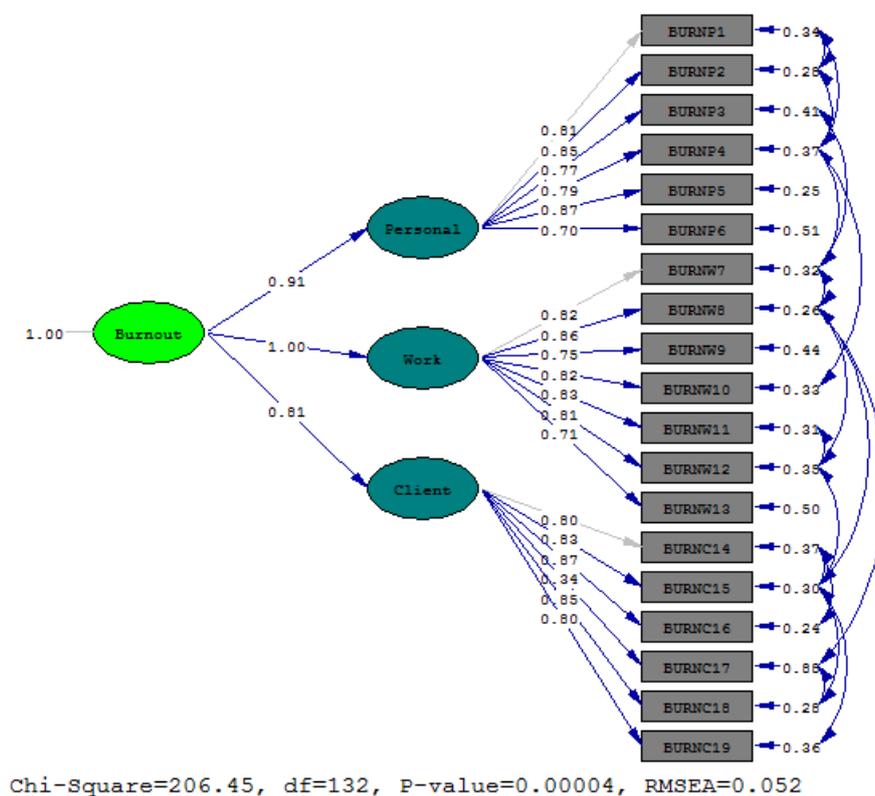
Figure 1 The final model of the T-CBI

T-CBI is similar to that of other major burnout scales.

Psychometric properties of the T-CBI demonstrated satisfactory content and construct validities, and internal consistency of the instrument with alpha coefficient of 0.94. The construct validity of T-CBI was tested by CFA. The results indicated that most fit indices were in acceptable ranges. However, a non-significant result was obtained for the chi-square (χ^2) test. The χ^2 statistical test or resulting p-value is less meaningful in instances of considerably large sample sizes or the number of observed variables. Therefore, the normed fit chi-square (χ^2 value divided by the degrees of freedom (χ^2/df)) was considered instead the significance of χ^2. A normed fit chi-square less than 3 is an acceptable recommended threshold [28]. In this study, it was 1.56 and other goodness-of-fit indices, such as the GFI >0.90, CFI >0.90, and PNFI >0.60 indicated a good fit. All factor loadings were significant ($p<0.05$), demonstrating the construct validity of the T-CBI and that proposed model was accepted as a good fit.

The present study shows that the T-CBI is a reliable and valid measure for assessing burnout among Thai nurses. However, the T-CBI was first translated and used in the Thai context in this study. There are some limitations in this study. The study was conducted in 3 tertiary governmental hospitals in Bangkok Metropolitan, Thailand. The results of the present study might not be generalized to nurses working in other provinces, thus, future study should be conducted in diverse settings. The study used a self-administered questionnaire; the participants might provide socially desirable responses.

The T-CBI is promising it usefulness in practice and future research. Nurse administrators and policy makers could use this accuracy measurement in addressing nurse's burnout. As nurses play the important roles in providing direct patient care in hospitals, the early detection of significant symptom of burnout among nurse is crucial. A comprehensive understanding of nurses' burnout could provide evidence to enable the effectively preventive intervention and create fit strategies to prevent negative impact of burnout, additionally, could improve quality of patient care which is a core value of nursing.

In conclusion, the T-CBI was developed for use among nurses in Thai health care context. The T-CBI appears to be a reliable and valid instrument in measuring nurses' burnout. It demonstrates good reliability and validity. The instrument could be useful for develop the effectively preventive intervention both organizational and individual level for burnout symptom determination among nurses personnel in health-care setting.

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