



Psychometric properties of the Chinese version of the attitudes towards cardiopulmonary resuscitation with defibrillation (ACPRD-C) among female hospital nurses in Taiwan



Hsing-Long Lin^{a,1}, Mei-Hsiang Lin^{b,1}, Chao-Chung Ho^c, Chin-Hua Fu^d, Malcolm Koo^{e,f,*}

^a Department of Nursing, Dalin Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, Dalin, Chiayi, Taiwan, ROC

^b School of Nursing, National Taipei University of Nursing and Health Sciences, Taipei City, Taiwan, ROC

^c Department of Nursing, Cardinal Tien Junior College of Healthcare and Management, New Taipei City, Taiwan, ROC

^d Department of Neurology, Asia University Hospital, Taichung City, Taiwan, ROC

^e Department of Medical Research, Dalin Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, Dalin, Chiayi, Taiwan, ROC

^f Dalla Lana School of Public Health, University of Toronto, Toronto, Ontario, Canada

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ABSTRACT

Introduction: Nurses are often the first responders to in-hospital cardiac emergencies. A positive attitude towards cardiopulmonary resuscitation with defibrillation may contribute to early cardiopulmonary resuscitation and rapid defibrillation, which are associated with enhanced long-term survival. The aim of this study was to translate and adapt the 31-item attitudes towards cardiopulmonary resuscitation with defibrillation and the national resuscitation guidelines (ACPRD) instrument into Chinese and to evaluate its psychometric properties in a sample of Taiwanese hospital nurses.

Methods: The ACPRD instrument was translated into Chinese using professional translation services. Content validity index based on five experts to refine the translated instrument. The final instrument was applied to a sample of 290 female nurses, recruited from a regional hospital in southern Taiwan, to assess its internal consistency, factor structure, and discriminative validity.

Results: The Chinese ACPRD instrument showed good internal consistency (Cronbach's alpha = 0.87). Seven factors emerged from the factor analysis. The instrument showed good discriminative validity and were able to differentiate the attitudes of nurses with more experience of defibrillation or cardiopulmonary resuscitation from those with less experience. Nurses working in emergency ward or intensive care unit also showed significantly higher overall scores compared to those working in other units.

Conclusion: The Chinese ACPRD demonstrated adequate content validity, internal consistency, sensible factor structure, and good discriminative validity. Among Chinese-speaking nurses, it may be used as a tool for assessing the effectiveness of educational programs that aim to improve their confidence in performing cardiopulmonary resuscitation with defibrillation.

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1. Introduction

Approximately 192,000 cases of in-hospital cardiac arrest are reported in the United States annually [8]. Survival to hospital discharge among patients who had an in-hospital cardiac arrest was estimated to be between 15% to 20% [11]. In typical hospital settings, nurses are often the first to arrive at a scene of cardiac emergencies. Early cardiopulmonary resuscitation (CPR) and rapid

defibrillation are correlated with higher cardiac arrest survival rates. A retrospective study of 1570 calls for rescue team in response to in-hospital cardiac arrests in a Swedish hospital showed that there was a significant association between the interval of collapse to the first defibrillation and survival to discharge from the hospital. When defibrillation was performed within 3 min, 66% of the patients would be discharged alive. On the other hand, only 20% would be discharged alive if defibrillated after 12 min [4]. Another study of 2160 in-hospital cardiac arrest records with 612 patients required defibrillation also indicated that time to defibrillation was the most important predictor for return of spontaneous circulation and survival to discharge [5].

* Corresponding author at: Dalin Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, 2 Minsheng Road, Dalin, Chiayi 62247, Taiwan, ROC.

E-mail address: m.koo@utoronto.ca (M. Koo).

¹ These authors contributed equally to this work.

A theoretical knowledge of cardiovascular resuscitation is necessary for CPR to be able to perform effectively [1,12]. However, a negative attitude towards CPR with defibrillation in hospital nurses may contribute to their reluctance in performing these procedures [2]. Mäkinen et al. [7] developed a questionnaire to compare the effect of CPR education on nurses' attitudes towards defibrillation during cardiac arrests and towards the Finland national resuscitation guidelines. Since similar instrument is not yet available in Chinese, the aim of this study was to translate and adapt Mäkinen et al.'s instrument into Chinese. In addition,

the psychometric properties of the translated instrument were evaluated on a sample of Taiwanese hospital nurses.

2. Methods

2.1. Instrument

The instrument developed by Mäkinen et al. [7] for assessing attitudes towards defibrillation during cardiac arrests and towards the Finland national resuscitation guidelines consisted of 31 items. The instrument was previously applied in a study on medical and nursing students in Finland [10]. The instrument contains five subscales emerged from a maximum likelihood factor analysis with a varimax rotation. A 7-point Likert scale with response categories ranging from completely disagree (1 point) to completely agree (7 point) was used. A global score was calculated by summing the scores of each item, after the 17 negatively worded item scores were reversed. Thus, a higher global score means a more positive attitude. The Cronbach's alphas were acceptable for the five subscales, ranging from 0.60 to 0.77.

2.2. Translation procedures

Permission to translate and adapt the English version of the original instrument to Chinese was obtained from Dr. Marja Mäkinen. The translation was done by a professional translation agency with a forward and backward process. The translated version of the instrument was first examined by a bilingual Chinese physician with over 20 years of practice in the United States for discrepancies with the original instrument. Then, content validity was assessed by five experts in related fields. The item-level content validity index (CVI) was 1 for all items except for four items (18, 20, 25, and 34 of the original English instrument) at 0.8 and one item (19 of the original English instrument) at 0.6. The instrument' level CVI was 0.97.

2.3. Psychometric testing

The provisional Chinese version of the instrument (hereafter referred to as ACPRD-C) was used for further psychometric evaluation in a sample of female nurses, recruited from a regional hospital in southern Taiwan. One investigator (HLL) was responsible for visiting all the adult wards of the study hospital to explain the aim of the study and distribute the study questionnaire. The questionnaire consisted of the ACPRD-C and questions on age, educational level, nursing proficiency level, current work unit, length in current position, clinical experience, number of times received Advanced Cardiac Life Support (ACLS) training, number of times CRP performed on patients in the past two years, number of times defibrillation performed on patients in the past two years. All full-time registered nurses who were hired in the study hospital

Table 1
Basic characteristics of nurse participants (N = 290).

Variable	n (%) unless otherwise specified
Age (year) (N = 290)	
≤28	98 (33.8)
29–34	109 (37.6)
≥35	83 (28.6)
mean ± standard deviation	31.8 ± 6.0
median (range)	32 (22–56)
Educational level (N = 290)	
Vocational school	99 (34.1)
University	191 (65.9)
Nursing proficiency level (N = 289)	
N or N1	176 (60.9)
N2, N3, or N4	113 (39.1)
Current work unit (N = 290)	
General ward or surgical ward	101 (34.8)
Outpatient department	102 (35.2)
Emergency ward or intensive care unit	87 (30.0)
Length in current position (months) (N = 277)	
Mean ± standard deviation	62 ± 41
Median (range)	52 (1–154)
Clinical experience (months) (N = 282)	
Mean ± standard deviation	102 ± 64
Median (range)	97.5 (3–426)
Number of times received ACLS training (N = 288)	
0 or 1	117 (40.6)
≥2	171 (59.4)
Number of times CPR performed on patients in the past 2 years (N = 288)	
0	126 (43.8)
1–3	72 (25.0)
≥4	90 (31.3)
Number of times defibrillation performed on patients in the past 2 years (N = 288)	
0	211 (73.3)
1–3	46 (16.0)
≥4	31 (10.8)

ACLS: Advanced Cardiac Life Support.

Nursing proficiency level based on the Clinical Ladder System of the Taiwan Nurses association: N = novice, N1 = beginner, N2 = advanced beginner, N3 = competent nurse, and N4 = proficient nurse.

Table 2
Model fit indices of the confirmatory factor analysis for the different models.

Model fit index	Acceptable criterion	5-factor model of the ACPRD	1-factor model of the ACPRD-C	7-factor model of the ACPRD-C
Likelihood-ratio χ^2	–	1570.1 [*]	3867.4 [*]	975.2 [*]
Degree of freedom	–	424	434	413
Likelihood-ratio χ^2 /degree of freedom	≤3	3.70	8.91	2.36
Standardized root mean square residual (SRMR)	≤0.08	0.230	0.213	0.074
Root mean square error of approximation (RMSEA)	≤0.08	0.106	0.165	0.074
Normed fit index (NFI)	≥0.90	0.723	0.319	0.828
Tucker-Lewis index (TLI)	≥0.90	0.759	0.294	0.879
Comparative fit index (CFI)	≥0.90	0.780	0.341	0.892

^{*} p < 0.001.

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