

RESEARCH METHODOLOGY

Childbirth Self-Efficacy Inventory and Childbirth Attitudes Questionnaire: psychometric properties of Thai language versions

Kamonthip Tanglakmankhong, Nancy A. Perrin & Nancy K. Lowe

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Correspondence to K. Tanglakmankhong:
e-mail: tang_kamon@hotmail.com

Kamonthip Tanglakmankhong MSN PhD
RN
School of Nursing,
Oregon Health & Science University,
Portland, Oregon, USA

Nancy A. Perrin PhD
Senior Investigator
Center for Health Research,
Kaiser Permanente Northwest, Portland,
Oregon, USA

Nancy K. Lowe PhD RN CNM
Professor & Chair
Division of Women, Children, & Family
Health, College of Nursing,
University of Colorado Denver, Aurora,
Colorado, USA

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Abstract

Aim. This paper is a report of the psychometric properties of the Thai language versions of the Childbirth Self-Efficacy Inventory and the Childbirth Attitudes Questionnaire, and the equivalence of the Thai and English versions of these instruments.

Background. The Childbirth Self-Efficacy Inventory and the Childbirth Attitudes Questionnaire were developed to measure women's abilities to cope with labour and fear of childbirth. Consistent with Bandura's Self-Efficacy Theory, women who have greater confidence in their ability to cope with labour have reported having less fear in childbirth. However, research is needed to validate the measures and this relationship in countries other than the United States of America, where the tools were developed.

Methods. Back-translation was used. Content validity was examined by experts. The psychometric properties were estimated with internal consistency reliability, construct validity, contrasted groups and criterion-related validity with 148 pregnant women at a hospital in Thailand in 2008.

Results. Both measures were shown to have high internal consistency. Contrasting group and criterion-related validity were consistent with self-efficacy theory and findings in the United States. Differences between the stages of labour across expectancies in the Childbirth Self-Efficacy inventory were found only for second stage.

Conclusion. Support for good validity and reliability of the instruments when used with Thai women was demonstrated. It may be appropriate for Thai women to use The Childbirth Self-Efficacy Inventory only in relation to the second stage of labour.

Keywords: attitudes, childbirth, fear, midwifery, nursing, psychometric properties, self-efficacy, Thai

Introduction

Thailand has been one of the most successful countries in South East Asia at reducing its maternal mortality rate; this rate has fallen from 374.3 per 100,000 live births in 1962 to 9.8 in 2006 (Wibulpolprasert *et al.* 2008). Government health authorities in Thailand recommend that all Thai women give birth in hospital with well-trained professionals, such as midwives, physicians or nurses (Sauvarin 2006) to keep improving maternal and neonatal mortality rates. However, giving birth in hospital is very different from home birth; when a woman gives birth at home, she has support from her family in a familiar environment. In contrast, staff in most delivery units in Thai public hospitals do not allow family members to be present at birth (Chunuan *et al.* 2004). Women must cope with their birth experiences alone in an unfamiliar environment in wards with several other women in labour. This situation, coupled with the fact that it is difficult to tell a woman exactly when spontaneous labour will occur, how long it will last, or what she will experience during its course, creates uncertainty, may lower self-efficacy, raise doubts about her ability to cope with labour and increase fear about the labour and birth process (Lowe 1993). There is a lack of research in Thailand on self-efficacy; given that birthing methods and experiences differ from country to country, we should not assume that research from other countries applies in Thailand.

Fear of childbirth has been recognized in several studies as a reason for increases in the number of women requesting elective caesarean sections (Melender 2002, Saisto & Halmesmaki 2003, Tsui *et al.* 2006, Waldenstrom *et al.* 2006, McCourt *et al.* 2007). A national survey examining hospital deliveries in Thailand during 1990–2001 showed that caesarean section rates increased from 14.8% in 1990 to a peak of 22.1% in 1996. Following an economic recession in Thailand, the caesarean section rate remains stable at approximately 20% (Teerawattananon *et al.* 2003). This rate exceeds the World Health Organization recommended rate of no more than 5–15% (Chalmers *et al.* 2001). Rates higher than 15% have been shown to be associated with more harm than good (Althabe & Belizin 2006).

Research in the USA has shown that higher self-efficacy for childbirth is associated with lower fear of childbirth (Lowe 2000, Kish 2003); therefore, it may be possible to improve childbirth experiences in Thailand by helping women to increase their self-efficacy and reduce fears of childbirth.

The Childbirth Self-Efficacy Inventory (CBSEI) is a measure that was originally developed in the USA through a series of studies based on Bandura's self-efficacy theory (Lowe

1993, 2000). The CBSEI has been tested in other countries, such as Australia (Drummond & Rickwood 1997), Northern Ireland (Sinclair & O'Boyle 1999) and Hong Kong (Ip *et al.* 2005). Multiple studies have provided evidence of good validity and reliability of the CBSEI (Dilks & Beal 1997, Kish 2003, Beebe *et al.* 2007) and the measure has been successfully translated into Chinese (Ip *et al.* 2005). Lowe (2000) developed the Childbirth Attitude Questionnaire (CAQ) to measure fear during childbirth and to explore the theoretically predicted inverse relationship between childbirth self-efficacy and fear in nulliparous women.

Knowledge about psychosocial aspects of childbirth is almost exclusively derived from studies with women in western countries in Europe and North America. Whether or not this knowledge can be applied to the care of childbearing women in Thailand is unknown and requires validation using culturally and psychometrically sound instruments. As there are no published studies with Thai women that have measured self-efficacy and fear of childbirth, it is important to conduct independent measurement validation studies to ensure the content, semantic, technical, criterion and conceptual equivalence of the Thai and English versions (Flaherty *et al.* 1988) and to give evidence for the validity and reliability of the Thai version.

Background

Self-efficacy theory

Self-efficacy is a primary concept of social learning theory that has been defined as 'people's judgments of their capacities to organize and execute courses of action required to attain designated types of performance' (Bandura 1986, p. 391). Self-efficacy is based on four major sources of efficacy information: performance accomplishments, vicarious experience, verbal persuasion and physiological responses. The most influential source of information is performance accomplishment (Bandura 1977). According to Bandura (2000), people act on their beliefs about what they can do (efficacy expectation), and on their beliefs about the probable outcome of performance (outcome expectation). Efficacy expectation and outcome expectation are not the same, because people can believe that a certain behaviour will produce a desired outcome, but if they think that they cannot perform that behaviour such information may not influence their behaviour. Self-efficacy theory has been applied in many areas of nursing research and has been used as a framework to guide other studies in pregnancy and childbirth (Sinclair & O'Boyle 1999, Beebe *et al.* 2007, Black 2007).

Childbirth self-efficacy

Many women may feel uncertain about their ability to get through labour and birth because childbirth is a difficult experience requiring a variety of coping behaviours, such as the ability to relax, breathe through contractions and listen to instructions from others (Lowe 1991). Childbirth self-efficacy has been defined as 'a woman's confidence in her ability to cope with labour' (Lowe 1991, p. 457). Consistent with Bandura's self-efficacy theory, women develop their childbirth self-efficacy, either positively or negatively, through personal experiences with labour and birth; vicarious experience of other women during childbirth; discussions with childbirth educators, other professionals, family members, and friends; and fear- or anxiety-associated autonomic responses that some women may experience when thinking about their approaching labour and birth. Research indicates that higher self-efficacy for labour is significantly correlated with lower fears (Lowe 2000) and anxiety in childbirth (Beebe *et al.* 2007). Previous experience with childbirth appears to improve self-efficacy, as multiparous women have higher self-efficacy than those who are pregnant for the first time (Lowe 1993).

Measuring childbirth self-efficacy and fear

Lowe (1993) developed the CBSEI based on Bandura's self-efficacy theory and measurement principles. The CBSEI measures both outcome expectancies and self-efficacy expectancies for coping with childbirth during the first and second stages of labour. It is intended for use during the third trimester of pregnancy, when women are actively contemplating their forthcoming birth experience. Internal consistency estimates have provided evidence for the reliability of the CBSEI in English (estimates range from 0.86 to 0.95; Lowe 1993) and Chinese (estimates range from 0.92 to 0.96; Ip *et al.* 2005). Using the Chinese version, researchers found that women could not differentiate between active and second stage labour (Ip *et al.* 2005). Therefore, Ip *et al.* (2008) developed a short form of the Chinese CBSEI by deleting the two repetitive expectancy subscales of the original version.

Lowe (2000) developed the CAQ to measure fear in childbirth. Fear is one of the major emotions that can affect perceived self-efficacy in coping with threatening situations (Bandura 1977). Analyses have supported the reliability of the CAQ, with an alpha equal to 0.83 (Lowe 2000) and 0.87 (Kish 2003). However, the instrument has not been translated into other languages.

Researchers must ensure that cross-cultural results are not due to error in translation or differences in the construct

being measured, but rather are due to real differences between cultures (Maneesriwongul & Dixon 2004). To answer these questions, content, semantic, technical, criterion and conceptual equivalences between instruments must be established (Flaherty *et al.* 1988). For example, if the English and Thai versions of an instrument are equivalent, they should have similar internal consistency, the items should be relevant in the Thai culture, and the meaning of the items should be the same in the two cultures. In the example, criterion-related validity would be supported if higher self-efficacy were associated with lower fear of childbirth (Bandura 1977, Lowe 2000, Kish 2003). Construct validity would be evidenced if the factor structure from the Thai versions of the instruments were consistent with those found in the USA (Lowe 1993) and China (Ip *et al.* 2005) and higher scores were found for women who had given birth previously in comparison to new mothers (Lowe 1993).

The study

Aim

The aim of the study was to test the psychometric properties of the Thai language versions of the CBSEI and the CAQ, and to examine the cultural equivalence including content, technical, criterion and conceptual equivalence of the Thai and English versions of the instruments.

Methodology

The Thai CBSEI and CAQ were developed in two phases. In the first phase, the instrument translation and content validity were tested. In the second phase, the psychometric properties were tested by estimating internal consistency reliability, construct validity, contrasted groups validity and criterion-related validity with Thai pregnant women.

Phase 1: Instrument translation and content validity testing with experts

Two bilingual experienced midwives did the forward-translation of the original English versions of the instruments into Thai. Back-translation was used to determine the equivalence of the original and translated versions. If the original version and back-translated versions are the same, the translated version is likely to be equivalent in meaning (Hilton & Skrutkowski 2002).

Seven experts were asked to judge the content validity of the translated CBSEI – four Thai nurse-midwife instructors and three Thai nurse researchers specializing in self-efficacy.

Five Thai nurse-midwife instructors were asked to judge the content validity of the translated CAQ. The raters read both the English and Thai versions of the questionnaire items and determined, if the translated CBSEI and CAQ items: (i) fitted the definitions of the concepts, (ii) were clear, and (iii) were appropriate for use with Thai pregnant women. The raters answered yes or no for each aspect and wrote any comments. A yes/no format was selected over 1-4 scale to avoid cultural differences in interpretation of the anchors for the numerical ratings. Content validity indices were calculated as the proportion of raters responding 'yes' to that item. The judgment-quantification stage of content validity required six of seven experts for the CBSEI and four of five experts for the CAQ to find that the item fitted the definition of the concept, was clear, and was appropriate for use with Thai pregnant women. Translated items that did not achieve the required minimum agreement among the experts were considered for potential revision, along with the comments about the items made by the content experts (Lynn 1986). Important item revisions were re-validated by the Thai content experts.

Phase 2: Psychometric evaluation among Thai pregnant women

The purpose of this phase was to evaluate the validity and reliability of the Thai version of the CBSEI and CAQ among Thai pregnant woman.

Participants

The majority of prenatal care in Thailand is provided by a universal coverage programme. Care is delivered in government hospitals and each major hospital has a prenatal clinic. All pregnant women who accessed care through a prenatal clinic at one major hospital in Thailand during January 2008 were invited to complete the questionnaires. Participation in the study was voluntary. Inclusion criteria were age 18-45 years, pregnant with a singleton foetus, in the third trimester of pregnancy (28-40 weeks), literate and fluent in Thai, not at high risk for complications of pregnancy, and not having had a previous caesarean delivery. The sample size was 150, giving a ratio of participants to number of items (for the longest scale) of 9.4-1, slightly below the recommended 10-1 ratio (Sapnas & Zeller 2002).

Instruments

Childbirth Self-Efficacy Inventory

The CBSEI (Lowe 1993) has four subscales. The first two are Outcome and Self-efficacy Expectancy for Active Labor

(Outcome AL and Efficacy AL) and have 15 items each. The other two subscales are Outcome and Self-efficacy Expectancy for Second Stage of labor (Outcome SS and Efficacy SS), with 16 items each, 15 of which are identical to the AL subscales. One additional item, 'Focus on the person helping me in labour', is included in each SS subscale. To differentiate between the stages of labour, women are oriented to the experience of active labour by the statement, 'Think about how you imagine labour will be and feel when you are having contractions 5 minutes apart or less'. For second stage of labour, women are asked to think about when they are pushing their baby out to give birth.

Scale scores are the mean of the responses to each item from 1 (not at all helpful or not at all sure) to 10 (very helpful or completely sure). The CBSEI has been psychometrically tested in the USA, where it had high internal consistency reliability with estimates ranging from 0.86 to 0.95 and item-total correlations > 0.30 for all items on each scale (Lowe 1993).

Childbirth Attitudes Questionnaire

The CAQ (Lowe 2000, Kish 2003) is a measure adapted from Harman (1988) and Areskog *et al.* (1982) to measure fear of childbirth. It is a 16-item questionnaire with a Likert response scale of 1-4, with higher scores representing higher fear. Scale scores are computed by taking the mean of the 16 items. Lowe (2000) reported an internal consistency reliability estimate for the CAQ of 0.83 in her study with 280 nulliparous women attending childbirth education classes after 28 weeks of gestation.

Ethical considerations

Ethics approval was attained from the appropriate institutional review boards. Nurses at the prenatal clinic were asked to give each pregnant woman an information sheet about the study when they arrived at the prenatal clinic. If the woman was interested and met the inclusion criteria, she was referred to the researcher, who informed her about the purposes of the study, possible benefits and anonymity of the data. An information sheet rather than an informed consent form was used to ensure that the researcher would not know the identity of any participants. Return of a completed questionnaire was considered as consent to participate.

Data analysis

Psychometric testing of the CBSEI and CAQ included Cronbach's alpha coefficients to estimate internal consistency reliability, factor analyses, correlations and *t*-tests. Five

exploratory factor analyses (one for each of the four subscales of the CBSEI and one for the CAQ) with principal axes factoring and oblique rotation were used to assess the unidimensionality and construct validity of each of the subscales. The four subscales of the CBSEI were analysed separately because systematic error in responses, due to the repetition of the items for active and second stage labour (Lowe 1993), is likely. Therefore, factor analyses for the Outcome AL subscale and Efficacy AL subscale each had 15 items and factor analyses for Outcome SS subscale and Efficacy SS subscale each had 16 items. Pearson's correlation coefficients for the CBSEI with the CAQ were used to assess concurrent validity. Independent *t*-tests of differences in outcome and self-efficacy expectancy between women with and without prior childbirth experiences were conducted to examine contrasting group validity. Paired *t*-tests were used to determine if women differentiated active labour from second stage, and outcome from self-efficacy expectancy. Level of significance was set at $P = 0.05$.

Results

Phase 1

Because the CBSEI items were repetitive in each subscale, the expert raters were asked to evaluate the 16 unique items of the CBSEI (Appendix A) and the 16 items for the CAQ (Appendix B). All translated items of the CBSEI and CAQ met the 80% criteria for fitting the conceptual definitions (Lynn 1986). Thirteen of the 16 CBSEI items were clear and 15 of the 16 items were evaluated as appropriate in Thai culture. Twelve of the 16 CAQ items were clear and 15 of the 16 items were evaluated as appropriate in Thai culture. Three CBSEI items and four CAQ items did not meet the minimum agreement of the experts, and were considered for revision. Based on suggestions from the experts, these items were paraphrased to clarify the conceptual meaning for Thai women.

The modified Thai instruments were back-translated to English by two Thai English department university professors. These translators had no prior knowledge of the original English versions and were not clinical or theory experts. The original versions and the back-translated versions were compared and discussed for clarity, comprehensiveness, appropriateness and cultural relevance. Comparison with the original version of CBSEI and CAQ indicated that only one CAQ item did not accurately reflect the English version and needed to be modified, providing evidence for semantic equivalence of the English and Thai versions of both instruments.

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Table 1 Participant demographics ($N = 148$)

	N (%)
Age in years (mean = 25.47, SD = 5.63)	
18–25	80 (54.05)
26–30	32 (21.62)
31–35	31 (20.95)
36–40	5 (3.38)
Education	
Primary school	43 (29.1)
Secondary school	81 (54.7)
College	10 (6.8)
Bachelor's degree	4 (9.5)
Parity	
Nulliparous	75 (50.7)
Multiparous	73 (49.3)

Phase 2

Participant demographics

The sample comprised of 150 Thai pregnant women. Data from two of them were not used because they failed to complete more than 20% of the items on the CBSEI and did not complete the CAQ. Table 1 shows the demographics of the 148 women, who had a mean age of 25.47 years (range 18–39 years). Over half (54.7%) reported at least some high school education and half reported being pregnant for the first time (50.4%).

Construct validity

In each of the four factor analyses for the subscales of the CBSEI, the first factor explained 39.58–50.49% of variance, the second explained 9.22–11.39% and the third explained 6.85–7.1%. The first three eigenvalues were 5.94, 1.71 and 1.04 for Outcome AL, 6.90, 1.64 and 1.07 for Efficacy AL, 7.75, 1.47 and 1.11 for Outcome SS, and 8.08, 1.58 and 1.10 for Efficacy SS. Both the second and third factors were not conceptually interpretable for any of the scales. The items that loaded on these factors did not have any clear association and could not be named. The single-factor solution for each of the subscales was interpretable and consistent with theory, and therefore selected for each scale. The variance explained for Outcome AL, Efficacy AL, Outcome SS and Efficacy SS was 39.58%, 42.27%, 46.02% and 48.43%, respectively. All items had acceptable factor loadings >0.40 (range 0.43–0.77 for Outcome AL, 0.51–0.77 for Efficacy AL, 0.58–0.73 for Outcome SS and 0.60–0.77 for Efficacy SS).

The first two eigenvalues for the CAQ were 6.41 and 1.47. The first factor explained 40.09% of variance and the second 9.21%. When examining the two-factor solution, the factor

Table 2 Comparison mean and standard deviation of the Childbirth Self-Efficacy Inventory (CBSEI) and the Childbirth Attitudes Questionnaires (CAQ) according to parity

Scales	Sample (N = 148)		Nulliparous (N = 75)		Multiparous (N = 73)		T	P
	Mean	SD	Mean	SD	Mean	SD		
Outcome AL	7.29	1.22	7.27	1.22	7.31	1.22	-0.18	0.854
Efficacy AL	7.19	1.39	6.91	1.42	7.48	1.29	-2.56	0.012*
Outcome SS	7.30	1.32	7.12	1.24	7.48	1.37	-1.66	0.099
Efficacy SS	7.16	1.47	6.87	1.46	7.45	1.43	-2.64	0.015*
CAQ	2.39	0.56	2.53	0.53	2.24	0.58	3.04	0.003**

* $P < 0.05$, ** $P < 0.01$.

Outcome AL, Outcome Expectancy for Active Labor; Efficacy AL, Self-efficacy Expectancy for Active Labor; Outcome SS, Outcome Expectancy for Second Stage of labor; Efficacy SS, Self-efficacy Expectancy for Second Stage of labor; CAQ, Childbirth Attitudes Questionnaire.

loadings were not clearly interpretable. The single-factor solution was appropriate and consistent with theory, with all items having factor loadings from 0.48 to 0.72.

Table 2 summarizes the means and standard deviations for each of the subscales by parity. Differences in outcome and self-efficacy expectancy between women with and without prior childbirth experience were used to give evidence for contrasting group validity. Independent *t*-tests showed that the mean self-efficacy score for women with childbirth experience was statistically significantly higher than for those without prior childbirth experience for both active (mean difference = -0.57, $P = 0.012$, 95% CI -1.01 to -0.13), and second stage labour (mean difference = -0.59, $P = 0.015$, 95% CI -1.05 to -0.12). However, the two groups of women were not statistically significantly different on outcome expectancy at either stage of labour. For the CAQ, the mean childbirth fear score for multiparous women was statistically significantly lower than for nulliparous women (mean difference = 0.27, $P = 0.003$, 95% CI 0.10-0.45).

Paired *t*-tests showed that the mean scores for outcome and self-efficacy expectancy did not differ between active and second stage labour. However, in second stage labour, outcome expectancy was statistically significantly higher than self-efficacy expectancy (mean difference = 0.14, $t = 2.23$, $P = 0.027$, 95% CI 0.02-0.26). In active labour, outcome and self-efficacy expectancy did not differ.

Criterion-related validity

Concurrent validity was assessed in terms of the relationship between the CBSEI and CAQ and was consistent with Lowe's (2000) findings. Total childbirth outcome expectancy scores had no relationship with childbirth fear, while total childbirth self-efficacy expectancy scores and fear had a statistically significant inverse relationship (Table 3).

Table 3 Comparison correlations of Childbirth Self-Efficacy Inventory (CBSEI) and Childbirth Attitudes Questionnaires (CAQ) scores in the present study and Lowe (2000)

CBSEI	Correlation with CAQ	
	Present study	Lowe (2000)
Outcome AL	-0.13	-0.10
Outcome SS	-0.12	-0.08
Total outcome	-0.15	-0.09
Efficacy AL	-0.22**	-0.37**
Efficacy SS	-0.19*	-0.33**
Total efficacy	-0.22**	-0.36**

* $P < 0.05$, ** $P < 0.01$.

Outcome AL, Outcome Expectancy for Active Labor; Efficacy AL, Self-Efficacy Expectancy for Active Labor; Outcome SS, Outcome Expectancy for Second Stage of labor; Efficacy SS, Self-efficacy Expectancy for Second Stage of labor.

Additional feedback from participants

Twenty participants were asked to paraphrase their understanding of the instructions and items after completing the questionnaire. For the CBSEI, many did not understand the words 'behaviour' and 'contraction'. They were also not familiar with the 1-10 response format. Based on their feedback, the instructions were revised to say, 'Please imagine a situation when you are in labour pain every five minutes or less, and the nurse suggests you do the following item. If the full score is 10, please indicate how many points you feel the suggestion could be in helping you deal with this part of labour'. In addition to the instructions, certain items also required rephrasing. For item 1, the word 'relax' was reworded as 'making your body become less stiff or less rigid'. For items 2, 3 and 14, the phrase 'labour pain', which is better known among Thai pregnant women, was substituted for 'contraction'.

Table 4 Comparison of reliability estimates in present study and five previous studies

Scales	Thailand (Present study)	HongKong (Ip <i>et al.</i> 2005)	United States of America (Lowe 2000)	Northern Ireland (Sinclair & O'Boyle 1999)	Australia (Drummond & Rickwood 1997)	United States of America (Lowe 1993)
Sample	Pregnant women 28–41 weeks N = 148	Pregnant women 36–41 weeks N = 148	Nulliparous women 28–41 weeks N = 280	Pregnant women 36–41 weeks N = 126	Pregnant women 7–41 weeks N = 100	Pregnant women 36–41 weeks N = 351
Outcome AL	0.89	0.93	0.88	0.91	> 0.90	0.86
Efficacy AL	0.92	0.92	0.90	0.93	> 0.90	0.93
Outcome SS	0.93	0.95	0.93	0.95	> 0.90	0.90
Efficacy SS	0.93	0.96	0.94	0.94	> 0.90	0.95
CAQ	0.90	N/A	0.83	N/A	N/A	N/A

Outcome AL, Outcome Expectancy for Active Labor; Efficacy AL, Self-Efficacy Expectancy for Active Labor; Outcome SS, Outcome Expectancy for Second Stage of labor; Efficacy SS, Self-efficacy Expectancy for Second Stage of labor; CAQ, Childbirth Attitudes Questionnaire.

Reliability

Cronbach's alpha coefficients of the Thai CBSEI ranged from 0.89 to 0.93, providing support for good reliability of the four CBSEI subscales. The estimated internal consistency reliability was 0.90 for the Thai CAQ. Table 4 presents a comparison of the reliability estimates for the Thai CBSEI and those from five studies conducted in USA (Lowe 1993), Australia (Drummond & Rickwood 1997), Northern Ireland (Sinclair & O'Boyle 1999) and Hong Kong (Ip *et al.* 2005), providing evidence for consistent reliability of the instruments across cultures.

Discussion

Study limitations

Although the study provides support for the content, semantic, technical, criterion and conceptual equivalence of the English and Thai versions of the CBSEI and CAQ, it is not without limitations. A convenience sample of pregnant women at one prenatal clinic in one major hospital in Thailand may not be representative of all women in Thailand. A study conducted with a new sample of women is needed to strengthen the findings of this study. Additional research is also needed to determine whether the Thai CBSEI should be shortened to only address second stage labour, because women could not differentiate between outcome and self-efficacy expectancies in the first stage. A revised short form of the Thai CBSEI is currently being evaluated.

Psychometric properties of the instruments

Self-efficacy theory, which has been applied in many areas of nursing research, including its role in prehospitalization

labour (Beebe *et al.* 2007), birth choice (Dilks & Beal 1997) and the progression of preeclampsia (Black 2007), has conceptual meaning in Thai in the context of childbirth. The framework seems to be applicable to a variety of cultures, including Hong Kong, Ireland and Australia (Drummond & Rickwood 1997, Sinclair & O'Boyle 1999, Lowe 2000, Ip *et al.* 2005).

Our study provided evidence of reliability for the subscales of the Thai CBSEI and the CAQ as evidenced by good internal consistency reliability, measured by Cronbach's coefficient alpha. The internal consistency estimates for the CBSEI were similar to those found in Hong Kong, Ireland, Australia and the USA, lending support to the equivalence of the CBSEI across cultures (Lowe 1993, 2000, Drummond & Rickwood 1997, Sinclair & O'Boyle 1999, Ip *et al.* 2005).

The content equivalence of the Thai and English versions of the CBSEI and CAQ was supported by high agreement among the expert raters on the appropriateness of each item to the Thai culture. Semantic equivalence was supported by the fact that raters considered that the items met the conceptual definitions as specified in English. When the instruments were back-translated, all items except for one were comparable to the English version, providing additional evidence for semantic equivalence of the Thai and English versions. The instruments are administered in a pencil and paper format in both cultures and the expert raters found the response scale to be appropriate for the Thai culture. The Thai participants used the full 1–10 range of the response scale for all but one item of the CBSEI, where the range was 2–10. For the CAQ, they used the full 1–4 range of the scale for all items. Both the expert raters' review and the use of the full range of the scale support the technical equivalence of the Thai and English versions of the CBSEI and CAQ.

What is already known about this topic

- The Childbirth Self-Efficacy Inventory was developed through a well-planned and conceptualized series of studies in the United States of America (USA) and other countries that have provided strong evidence that the measure has good psychometric properties.
- The Childbirth Attitudes Questionnaires were developed to measure fear of childbirth and to explore the theoretically predicted relationship between childbirth self-efficacy and fear in nulliparous women.
- Consistent with Bandura's self-efficacy theory, self-efficacy expectancies in childbirth are statistically significant correlated with childbirth fears.

What this paper adds

- Evidence for the validity of Thai language versions of the Childbirth Self-Efficacy Inventory and Childbirth Attitudes Questionnaire, supported by contrasting groups and criterion-related validity.
- Evidence of strong internal consistency reliability for the Thai language versions of the Childbirth Self-Efficacy Inventory and Childbirth Attitudes Questionnaire.
- Childbirth self-efficacy scores for active labour and second stage of labour cannot be easily distinguished among Thai Pregnant women.

Implications for practice and/or policy

- The Thai language versions of the Childbirth Self-Efficacy Inventory and Childbirth Attitudes Questionnaire can be used in a Thai population to understand women's self-efficacy and fear of childbirth.
- The standard for using an instrument in another language should include content validity with experts, monolingual testing with a culturally appropriate sample and back-translation for conceptual, cultural and linguistic appropriateness.
- Increasing a woman's self-efficacy of childbirth can reduce her fear of labour and childbirth.

The CBSEI was found to have a single factor for each subscale, as did the Chinese version (Ip *et al.* 2005) and the English version (Lowe 1993). Consistent with Lowe's findings, the second and third factors were theoretically and empirically uninterpretable. However, the single-factor solution was clearly interpretable in all three cultures, supporting the conceptual equivalence of the CBSEI across Thai, Chinese and English (Flaherty *et al.* 1988). The finding that self-efficacy

expectancy in women who had prior childbirth experience was statistically significant higher than for those having their first child further supported the conceptual equivalence of the CBSEI between the Thai and English versions. This is consistent with self-efficacy theory and the previous finding of Lowe (1993). However, the studies in North Ireland and Australia did not demonstrate this difference (Drummond & Rickwood 1997, Sinclair & O'Boyle 1999). In the study in Australia, further differences in outcome expectancy and self-efficacy were by comparing women with good and bad previous experiences (Drummond & Rickwood 1997). This showed that a prior good experience had statistically significant effects on childbirth self-efficacy. Consistent with Bandura's (1977) theory of self-efficacy, expectation of personal mastery affects both initiation and persistence of coping behaviour. Women who have good childbirth experiences are more likely to have more self-efficacy expectancies if they judge themselves capable of handling that situation.

When assessing the sensitivity of the CBSEI in differentiating outcome from self-efficacy expectancies, and in differentiating between the stages of labour, the non-significant findings indicate that the stages of labour cannot be easily distinguished from each other by Thai women. This is consistent with previous findings in Australia (Drummond & Rickwood 1997) and Hong Kong (Ip *et al.* 2005) that raised concerns about the use of two repetitive and parallel sets of expectancy scales to differentiate between the first and second stages of labour. These researchers claimed that women's confidence in their coping and their repertoire of coping behaviours did not vary across the birth process (Drummond & Rickwood 1997, Ip *et al.* 2005). Recently, Ip *et al.* (2008) have developed a short form of the Chinese CBSEI by using only the two subscales of Outcome SS and Efficacy SS.

The differences between outcome expectancy and self-efficacy were statistically significant only for second stage labour in the present study, while previous researchers (Lowe 1993, Sinclair & O'Boyle 1999, Ip *et al.* 2005) reported outcome expectancy to be greater than self-efficacy scores for both stages of labour. Perhaps Thai women cannot differentiate outcome and self-efficacy expectancies well. On the other hand, Thai women may be able to differentiate the expectancies in the second stage labour because it is more intense than active labour. As some participants in this study explained, pushing the baby out was easier to imagine than thinking about having labour pain every 5 minutes because they had impressions of second stage labour from films, books or other women's experiences. This ability of Thai women to imagine the second stage labour might help them differentiate between outcome and self-efficacy expectancies during childbirth.

The pattern of findings with respect to differentiation between outcome and self-efficacy expectancies and differentiation between active and second stage labour did not support criterion equivalence between the Thai and English versions of the CBSEI. While in western cultures, self-efficacy in active and second stage labour tend to be seen as two distinct concepts, Thai women appeared to see them as the same concept. However, the pattern of correlations between the CBSEI subscales and the CAQ was similar for the English and Thai versions of the instruments, providing supporting evidence for criterion equivalence.

The Thai CAQ demonstrated good internal consistency reliability as measured by Cronbach's coefficient alpha, consistent with the previous study by Lowe (2000). Although factor analysis of CAQ was not previously reported, exploratory factor analysis was conducted to test the construct validity of CAQ. The single-factor solution had good loadings for all items; therefore, it is appropriate to measure fear of childbirth with a single total score. Correlations between the CAQ and CBSEI mirrored those found with the English version, providing support for the criterion equivalence of the Thai and English versions of both instruments. Although there were no relationships between outcome expectancy for either the stage of labour or fear, higher self-efficacy expectancy for active labour and the second stage labour were associated with lower fear. However, the correlations were weaker than those reported by Lowe (2000). This could possibly be due to the fact that Lowe's study only included nulliparous women, while our study included both nulliparous and multiparous women.

Conclusion

Our findings support the equivalence of the Thai and English versions of the CBSEI and CAQ. Evidence was found to support the validity and reliability of both instruments when tested with Thai pregnant women. However, the data suggest that women responded to the items in the Thai CBSEI in the same manner for active and second stages of labour. Therefore, it may be appropriate for Thai women to use the CBSEI only for second stage labour where differentiation of outcome and self-efficacy expectancies was demonstrated. Additional research is needed to cross-validate these findings and determine whether the Thai CBSEI should be shortened to only address the second stage of labour. This study and others have shown that lower self-efficacy for childbirth is associated with greater fear of childbirth. Therefore, increasing Thai women's self-efficacy during childbirth may be one approach to improve childbirth experiences in Thailand. The Thai versions of the CBSEI and CAQ will be useful in

developing and testing interventions to improve women's birth experiences in Thailand.

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Conflicts of interest

None.

Author contributions

KT, NP and NL were responsible for the study conception and design. KT performed the data collection. KT and NP performed the data analysis. KT and NP were responsible for the drafting of the manuscript. KT, NP and NL made critical revisions to the paper for important intellectual content. NP provided statistical expertise. KT provided administrative, technical or material support.

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Appendix A*

Childbirth Self-Efficacy Inventory Items (Lowe 1993)

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- | | |
|-----|---|
| 1. | Relax my body (making your body becomes less stiff or rigid)** |
| 2. | Get ready for each contraction (get ready for each labour pain)** |
| 3. | Use breathing during labour contractions (use breathing during labour pain)** |
| 4. | Keep myself in control |
| 5. | Think about relaxing |
| 6. | Concentrate on an object in the room to distract myself |
| 7. | Keep myself calm |
| 8. | Concentrate on thinking about the baby |
| 9. | Stay on top of each contraction (try to control each pain that happens)*** |
| 10. | Think positively |
| 11. | Nor think about the pain |
| 12. | Tell myself that I can do it |
| 13. | Think about others in my family |
| 14. | Concentrate on getting through one contraction at a time |
| 15. | Focus on the person helping me in labour |
| 16. | Listen to encouragement from the person helping me |
-

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**The revised items in Thai version based on Thai pregnant women's suggestions.

***The revised items in Thai version based on the experts' suggestions.

Appendix B*

Childbirth Attitudes Questionnaires Items (Lowe 2000)

1.	I have fear of losing control of myself at the delivery
2.	I am really afraid of giving birth
3.	I have nightmares about the delivery (considered for deletion in Thai CAQ)
4.	I have fear of bleeding too much during the delivery
5.	I have fear I will not be able to help during the delivery
6.	I have fear of something being wrong with the baby
7.	I have fear of painful injections
8.	I have fear of being left alone during labour
9.	I have fear of having to have a Caesarean section
10.	I have fear of being torn with the birth of the baby*** (I have fear of vaginal tear when giving birth)
11.	I have fear of the baby being injured during the delivery
12.	I have fear of painful labour contractions
13.	I have difficulty relaxing when thinking of the coming birth*** (I feel uneasy when thinking about the upcoming birth-giving)
14.	I have fear of the hospital environment*** (I have fear of the environment in labour and birth room)
15.	I have fear of not getting the kind of care that I want
16.	Overall, I would rate my anxiety about childbirth as

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***The revised items in Thai version based on the experts' suggestions.

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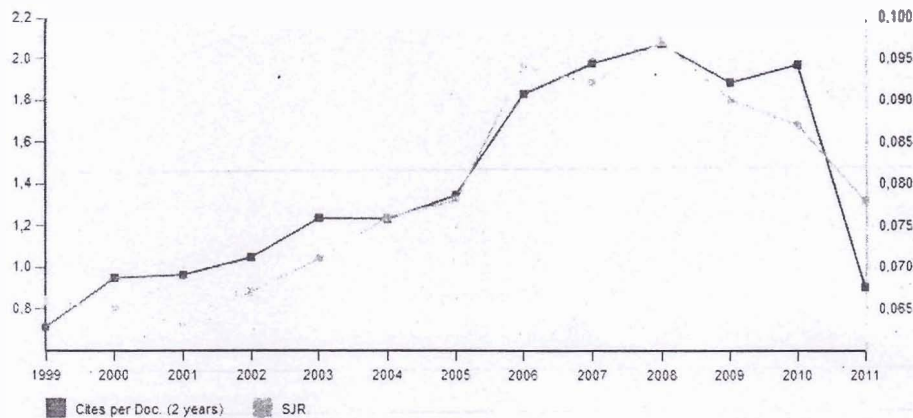
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