Validation of the Short Form of the Chinese Childbirth Self-Efficacy Inventory in Mainland China

Ling-Ling Gao,[1]* Wan-Yim Ip,[2]* Ke Sun[3]**

[1]School of Nursing, Sun Yat-sen University, 74, Zhongshan Road II, Guangzhou 510089, China
[2]Nethersole School of Nursing, The Chinese University of Hong Kong, Shatin, Hong Kong, China
[3]The Third Affiliated Hospital of Sun Yat-sen University, Guangzhou, China

Abstract: Self-efficacy increasingly has been reported as an important outcome measure in childbirth care. The purpose of this study was to evaluate the psychometrics of the short form of the Chinese Childbirth Self-Efficacy Inventory (CBSEI-C32) in mainland China. A convenience sample of 297 pregnant Chinese women who were attending the out-patient clinic of the study hospital in Guangzhou participated in the study. The participants were asked to complete the CBSEI-C32, the Chinese Self-Rating Anxiety Scale (CSAS), the Chinese Self-Efficacy Scale (CSE) and the socio-demographic questionnaire. A subgroup of 75 pregnant women was selected randomly from the total sample using a table of random numbers for test–retest reliability assessment. The findings demonstrate high internal consistency (Cronbach's $\alpha = .96$) and test–retest reliability (intraclass correlation coefficient $= .88$) for the CBSEI-C32. Confirmatory factor analysis showed some support for a two-factor structure of the CBSEI-C32, and construct validity was further supported by a significant relationship with CSAS. The CBSEI-C32 has the potential to be used as a clinical and research instrument for measuring childbirth self-efficacy in women in mainland China. © 2010 Wiley Periodicals, Inc. Res Nurs Health 34:49–59, 2011

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Childbirth is a stressful experience, and women cope with this stress in many different ways and with varying degrees of personal satisfaction. Childbirth self-efficacy, or confidence in one's own ability to cope with labor, can be considered as an important factor affecting pregnant women's motivation for vaginal childbirth and their interpretation of childbirth outcomes (Lowe, 1993).

In 1993, Lowe developed a 62-item questionnaire (the Childbirth Self-Efficacy Inventory, CBSEI) to measure maternal self-efficacy for coping with labor (Lowe, 1993). In view of the

repetitive items of the original CBSEI, Ip, Chung, and Tang (2008) developed a short form, the 32-item Chinese Childbirth Self-Efficacy Inventory (CBSEI-C32) that was examined in a sample of pregnant Chinese women in Hong Kong. Because there are political, social, and cultural differences between mainland China and Hong Kong, it was essential to test the reliability and validity of the instrument prior to its adoption into clinical practice in mainland China.

BACKGROUND OF THE STUDY

Childbirth is a developmental event, and a woman's self-efficacy for childbirth has been shown to be related to how the birth is perceived and coped with (Ip, Tang, & Goggins, 2009; Lowe, 1991). Pregnant women's perceptions may influence the meaning and consequences of childbirth. One way to investigate a woman's perceptions about childbirth would be to study her self-efficacy (Ip et al., 2008).

The notion of perceived self-efficacy was first proposed by Bandura (1977, 1986); it refers to a personal judgment of one's own ability to cope in a specific situation. It is composed of two factors, outcome expectancy (OE) and efficacy expectancy (EE). OE is the belief that a certain behavior will produce a particular outcome. EE is the personal conviction that one can successfully perform those behaviors to produce the desired outcome (Bandura, 1977; Lowe, 1993). OE is related to EE because the outcome beliefs in part determine the expectations (Siela & Wieseke, 2000). According to Bandura (1997), a person with high self-efficacy is more willing to pursue an activity, in spite of difficulties, than a person with lower self-efficacy.

Self-efficacy is believed to be an important variable in childbirth because it predicts how much effort will be expended and how long a woman will persist with behaviors that assist her to remain in control of the birthing process (Watt & Martin, 1994). Pain during labor is a stressor that may affect a woman's perception of control. Previous researchers have found that self-efficacy significantly contributed to predicting labor pain (Larsen, O'Hara, Brewer, & Wenzel, 2001; Stockman & Altmaier, 2001). Women with greater self-efficacy reported less perceived pain during the process of labor (Ip et al., 2009; Lowe, 1996; Stockman & Altmaier, 2001). That self-efficacy makes pain easier to manage is corroborated by previous research on other types of pain (Resnick et al., 2007).

Self-efficacy during childbirth is also related to the state of anxiety that is specific to childbirth (Beebe, Lee, Carrieri-Kohlman, & Humphreys, 2007; Ip et al., 2009; Lowe, 2000). This anxiety is associated with the potential for obstetric complications during pregnancy and childbirth (Rizzardo, Magni, Cremonese, Rossi, & Cosentino, 1988). Moreover, negative emotional states, such as anxiety, are believed to affect self-efficacy both directly, through negative perceptions of physiological arousal, and indirectly, through the impact this arousal has on performance (Kavanagh, 1992). In fact, previous researchers have demonstrated that individuals with a firm belief that they can exercise some control over pain and physical functioning report fewer pain behaviors, less mood disturbance, and better psychological well-being (Green & Baston, 2003).

Parity has been identified in previous studies as a strong predictor of childbirth self-efficacy (Drummond & Rickwood, 1997; Ip et al., 2008). Primigravid women were found to have a significantly lower level of self-efficacy for childbirth than the multigravid women (Ip et al., 2008). Lowe (1991) explained that a positive past experience of childbirth is a powerful source of information that contributes to building a woman's sense of competence to remain in control during subsequent births.

The cesarean section (CS) rate has reached 50–70% in some large Chinese cities such as Beijing, Shanghai, and Guangzhou in mainland China. The reasons for the high CS rate are not only related to the women's physical condition, but also a result of women's individual preferences (Shi & Gong, 2005). Further, it was shown that lack of confidence in vaginal delivery and fears of labor were the main reasons for a planned CS (Y. Li, Sun, & Zhang, 2007). Many women who choose CS believe that it is not only safer than vaginal delivery, but also less painful and associated with less anxiety (Cheng et al., 2003). However, the lack of a reliable and valid mainland Chinese version of a childbirth self-efficacy instrument is a barrier to the understanding of self-efficacy for childbirth and the development of interventions to enhance that self-efficacy.

Although Hong Kong was returned to China in 1997, under the "One country two systems" policy, there are political, social, and cultural differences between mainland China and Hong Kong. Compared with mainland China, Hong Kong is more industrialized, more developed, and more deeply influenced by Western values. For example, in mainland China, childbirth is still

seen as "women's business," and fathers are not expected to be present or to provide support to their partners during labor and delivery (Kartchner & Callister, 2003). Fathers or partners who ask to stay with women in the labor ward are charged a fee of 200–800 Yuan (equivalent to US $29–118; Zhang, Dai, & Zeng, 2007). In Hong Kong, fathers are encouraged to be present and to support their partners during labor and delivery; this is recognized as a part of family-centered care, and no extra fee is charged (Ip, 2000).

Additionally, pregnant women in Hong Kong enjoy a subsidy of more than 90% for health care services (Yuk & Wong, 2009). In mainland China, only 100 million of the urban population (49.6% of all those employed) are covered by health insurance (China Ministry of Statistics, 2004). Many women in urban areas such as Guangzhou have to pay for their delivery services themselves (Gao, 2010). Healthcare providers are paid on a fee-for-service basis whether the mothers are insured or uninsured.

Further, there is no legal restriction on how many children couples in Hong Kong may have. In mainland China the one child policy was introduced to control population in 1979. In the cities, the policy is strictly applied, with a few exemptions. In rural areas, a second child is generally allowed after 5 years, especially if the first child is a girl (J. H. Li, 2004). Third children are allowed for some ethnic minorities. In cities, most women have only one opportunity for childbirth in their lifetime, and pregnant women or their families may consider that the perceived advantage of cesarean section outweighs the risk of surgery (Wu, 2000).

Because the political, social, and cultural contexts are quite different between mainland China and Hong Kong, a rigorous validation process was essential before the adaptation of the CBSEI-C32 for use in pregnant women in mainland China. The findings of this study contribute to a better understanding of pregnant women's confidence in their coping abilities for labor and facilitate the development of culturally appropriate nursing care.

Study Aim

The aim of this study was to test the CBSEI-C32 in mainland China. The following questions were addressed:

1. Does a two-factor model for the CBSEI-C32 fit the data well?
2. Can the two-factor structure of the CBSEI-C32 demonstrate criterion-related concurrent validity with the Chinese Self-Efficacy Scale and the Chinese Self-Rating Anxiety Scale?
3. Can the two-factor structure of the CBSEI-C32 distinguish primigravid women from multigravid women?
4. Is the two-factor structure of the CBSEI-C32 internally consistent?
5. Is the CBSEI-C32 stable over brief intervals?

METHODS

Sample

Guangzhou is a sub-provincial city located in southeastern China. It is the capital of Guangdong Province and has a population of approximately 10 million. According to the National Health Services Survey (China Ministry of Statistics, 2004), among all pregnant women who delivered infants in mainland China, 20% in the rural areas and more than 63% in the urban areas were admitted to general hospitals. A strong technological influence has developed, and midwives are involved in task-oriented situations in general hospitals with little time is available for psychological and individualized support (Hong, 2007). The study was carried out in one general hospital, a leader in providing obstetric services in Guangzhou, where about 3,000 babies are delivered per year.

Some authors recommend that 5 or more participants per item is an acceptable sample size for factor analysis (Bryant & Yarnold, 1995; Gorsuch, 1983); others suggest that a sample size of 200 is adequate in most cases of factor analysis (DeVellis, 2003). A convenience sample of 300 pregnant Chinese women who were attending the out-patient clinic of the study hospital for follow-up visits in their third trimester of pregnancy was recruited for the study. The inclusion criteria included being a pregnant woman in the third trimester of pregnancy and able to read Chinese. In line with previous studies (Ip et al., 2008; Lowe 1993; Sinclair & O'Boyle, 1999), only pregnant women who had planned elective caesarean section at the time of recruitment were excluded from the study. A subgroup of 75 pregnant women was selected randomly from the total sample using a table of random numbers to assess for test–retest reliability.

Instruments

The CBSEI-C32. The original CBSEI (Lowe, 1993), based on Bandura's (1977, 1997) self-efficacy theory, is a psychometrically sound

diagnostic tool for evaluating women's self-efficacy for childbirth (Drummond & Rickwood, 1997; Lowe, 1993; Sinclair & O'Boyle, 1999). The CBSEI scale has shown high internal consistency reliability across studies (.86–.95), and an exploratory factor analysis suggests that each CBSEI subscale is unidimensional (Lowe, 1993). The original CBSEI is a 62-item, four factor structure scales being made up by two repetitive sets of variables. The first two factors 15-item subscales (OE-15 and EE-15) are completed during first stage of labor, and the other two are 16-item subscales (OE-16 and EE-16) completed during the second stage of labor. Each of the four subscales consists of the same 15 items which address common non-pharmacological coping behaviors for childbirth, such as "relax my body" and "use breathing during labor contractions". One additional item "focus on the person helping me in labor" is included in the OE-16 and EE-16 subscales. In view of the repetitive items used for eliciting the response across the two stages of labor and the lengthy structure of the original CBSEI, Ip et al. (2008) developed a short-form, two-factor structure Chinese CBSEI by deleting two repetitive subscales (OE-15 and EE-15) of the Chinese version of the original CBSEI (Ip, Chan, & Chien, 2005).

The short form of the CBSEI (Ip et al., 2008) has two parallel subscales: OE-16 and EE-16. The two subscales, which consist of the same 16 items measuring coping behavior for childbirth, such as breathing and coughing exercises, distraction, and relaxation, were adopted for measuring women's perceived self-efficacy in coping with the whole labor process. The respondents to the short-form CBSEI are asked to rate the helpfulness and the certainty of exercising the coping items on a 10-point self-report scale from 1 (not at all helpful) to 10 (very helpful) for the OE-16, and from 1 (not at all sure) to 10 (very sure) for the EE-16. Each of the subscale measures yields a scale score between 16 and 160. In each case, a higher score indicates a higher level of OE or EE for labor. The CBSEI-C32 has been shown to be a valid and reliable self-report measure of women's self-efficacy in coping with childbirth in a sample of the Chinese population in Hong Kong, with reported Cronbach's alpha values of > .90 for each subscale and favorable fit indices supporting the conceptual dimensions of the scale (Ip et al., 2008).

The CBSEI-C32 was reviewed for content validity by three professional midwives. These experts provided written feedback on the clarity of the instructions and on the relevance of the content of the CBSEI-C32 items to the Chinese culture in mainland China, but were not requested to provide a quantitative rating for each item. The wording of one item was revised to enhance comprehension, as suggested by the expert panel.

The Chinese Self-Efficacy Scale (CSE). The CSE (Schwarzer & Jerusalem, 1995) is a 10-item, 4-point self-report scale used to assess a general sense of perceived self-efficacy to cope with stressful life events. The CSE was validated in 14 cultures including Chinese, Indonesian, Japanese, and Korean communities. The Chinese version of the CSE has supportive reliability. The reported test–retest reliability over 2 weeks was .85 (Chiu & Tsang, 2004). Reported internal consistency estimates range from .91 to .93 (Cheung & Sun 1999; Chiu & Tsang 2004; Zhang & Schwarzer, 1995). Significant correlations with measures of political efficacy, anxiety, and depression support construct validity (Cheung & Sun 1999; Chiu & Tsang 2004; Zhang & Schwarzer, 1995). In the present study, the Cronbach's alpha of the CSE was .81.

The Chinese Self-Rating Anxiety Scale (CSAS). The CSAS (Zung, 1971) has been used in a variety of studies among Chinese women (X. Q. Wang, Lambert, & Lambert, 2007; J. D. Wang & Zhao, 2004). It is a 20-item scale measuring symptoms of anxiety, with some of the items reflecting a positive and some a negative perception. They are answered on a 4-point scale ranging from 1 (none or a little of the time) to 4 (most or all of the time). Negatively worded items are reverse scored prior to the summation of the individual item responses. The total score is multiplied by 1.25 to reach a standardized score ranging from 25 to 100; a higher score reflects a higher level of anxiety. We did not find construct validity for the CSAS reported in the literature. However, the CSAS has demonstrated adequate content validity by being sensitive to change in treatment study of anxiety (Zhang, Song, & Guo, 2009). A significantly negative correlation with the measure of childbirth self-efficacy (CBSEI-C32) in the present study supports construct validity of the CSAS. The internal consistency, Cronbach's alpha, ranged from .72 to .81 among Chinese people (X. Q. Wang et al., 2007; J. D. Wang & Zhao, 2004). The Cronbach's alpha was .80 in the present study.

A self-designed questionnaire was also used to measure respondents' socio-demographic variables and obstetric data including parity, gestational age, and childbirth education attendance.

Procedure and Ethical Considerations

Permission to access the study site and ethical approval were gained from the study hospital and the Sun Yat-sen University in Guangzhou. Potential respondents were informed about the purpose and procedure of the study, and the women's written consents were obtained before inclusion. Voluntary participation and confidentiality of data were assured. It was emphasized that refusal or withdrawal from the study would not influence the care received.

After gaining ethical approval, a pilot study on 10 eligible subjects was carried out to assess the logistic issues in the feasibility of the study and to identify any unpredicted data collection problems. No problem in understanding and completing the CBSEI-C32 was reported. A training session was provided for the research assistant (RA) to ensure the accuracy and consistency of the data collection.

The trained RA was responsible for collecting data. All eligible subjects who were waiting for their appointments at the obstetric out-patient clinic of the study hospital were invited to participate in the study. After giving informed consent, the participant was asked to complete the CBSEI-C32, CSE, CSAS, and socio-demographic questionnaire in an interview room. The RA remained in the vicinity to answer questions and received returned questionnaires personally. The re-testing of the CBSEI-C32 on the subsample was carried out 2 weeks later in the same clinic. The duration of each data collection was approximately 15–20 minutes. All data were collected during a 5-month period in 2009.

Data Analysis

Data were analyzed using the SPSS for Windows, version 16.0 (SPSS, Inc., Chicago, IL). Descriptive statistics were used to summarize demographic characteristics. The internal consistency of the CBSEI-C32 was assessed using Cronbach's alpha together with Guttman's split half. The test–retest reliability of the initial data collection and the 2-week follow-up was calculated using the intraclass correlation coefficient (ICC). An ICC above .75 indicates acceptable reliability over brief intervals (Portney & Watkins, 2000).

The construct validity of the CBSEI-C32 was examined by calculating the correlation coefficients of the CBSEI-C32 with the CSE and the CSAS. An independent t-test was used to compare the difference in the CBSEI-C32 scores between the primigravid and multigravid women. Confirmatory factor analysis (CFA) was conducted using LISREL 8.80, and Bartlett's tests were performed to examine the adequacy of the data for factor analysis. The maximum likelihood method was chosen for parameter estimation to test the two-factor structure of the CBSEI-C32. The overall fit of the model was examined by goodness-of-fit indices, including a Chi-square test (χ^2), the relative mean square error of approximation (RMSEA), the normed fit index (NFI), non-normal fit index (NNFI), comparative fit index (CFI), and incremental fit index (IFI).

RESULTS

Sample Characteristics

Of 300 questionnaires distributed to eligible women, two were found to have more than 10% missing data. A total of 298 completed questionnaires were collected for data analysis. In the data cleansing procedure, the assumptions of multivariate normality and linearity were evaluated. Using Mahalanobis distance, one pregnant woman was identified as a multivariate outlier, $p < .001$, and the data from this woman were deleted. This woman showed an extremely high OE subscale score and an extremely low EE score. The data for final analysis came from 297 women, all having fully complete scales and questionnaires.

Ages of the 297 women ranged from 20 to 39 years (mean = 28.3, $SD = 3.1$), and the mean gestational age was 238.2 days ($SD = 15.2$) at enrollment. Table 1 presents the other sociodemographic characteristics of the sample. The clear majority were primigravidas. All the participants were married, and almost 80% of the women had at least a tertiary education. The majority of the women were employed ($n = 241$, 81.5%), with a monthly household income more than ¥4,000 (US$600) per person, which was above the average monthly household income in Guangzhou (Gao, 2010).

Comparison of Mean CBSEI-C32 Scores Between Mainland Chinese and Hong Kong Women

Table 2 presents a comparison of the mean and standard deviations of the subscales of the CBSEI-C32 in the present study and the study conducted in Hong Kong (Ip et al., 2008). The mean scores

Table 1. Socio-Demographic Characteristics of Sample (n = 297)

Characteristics	n (%)
Parity	
Nullipara	242 (81.5)
Multipara	55 (18.5)
Educational level	
Primary	1 (.3)
Secondary	64 (21.5)
Tertiary or university	232 (78.1)
Occupation	
Housewife	52 (17.5)
Skilled	85 (28.6)
Clerical	63 (21.2)
Professional/managerial	97 (32.7)
Household income (monthly)	
< ¥1,000	3 (1.0)
¥1,000–1,999	12 (4.0)
¥2,000–2,999	44 (14.8)
¥3,000–3,999	55 (18.5)
≥ ¥4,000	183 (61.6)
Insurance covered	
Yes	136 (45.8)
No	161 (54.2)
Antenatal class attendance	
Yes	297 (100.0)
No	0 (0)

obtained from the primigravid women in mainland China in this study had a similar pattern to the previous study in Hong Kong, with OE scores higher than EE scores. Apart from this similarity, all the subscale mean scores in this study (mean = 119.10–139.07) were higher than those reported in Hong Kong.

Reliability

The Cronbach's alpha was .96 for the total scale and .91 and .94 for the subscales measuring OE and EE, respectively, indicating adequate internal consistency. Subscales to total scale correlates were .95 ($p < .01$) for the OE-16 subscale and .96 ($p < .01$) for the EE-16 subscale, and the correlation coefficient between the subscales was .85 ($p < .01$), indicating significant overlap between the two subscales. The ICC was .82 for the OE-16 and .84 for the EE-16, with a total scale ICC of .88, indicating a high stability of the CBSEI-C32 over a 2-week period (Table 3).

Construct Validity

The first step of the CFA indicates that the matrix was suitable for factor analysis, as Bartlett's test of sphericity gave $p < .0005$ and the Kaiser–Meyer–Olkin measure of sampling accuracy was .91 (George & Mallery, 2006). As to the overall fit of the model, there was mixed support for the two-factor structure of the CBSEI-C32. The values of factor loadings indicate that the items had significant loadings on the two-factor solution as OE and EE as listed in Figure 1. Factor loadings ranged from .43 to .85 on OE, and from .57 to .85 on EE, with all items demonstrating moderate to strong factor loadings above .40 (Fig. 1). The statistical significance of the two-factor correlations ($r = .85$, $p < .01$) supports the hypothesis that the two factors (OE-16 and EE-16) are highly related dimensions of self-efficacy for childbirth. The Chi-square test ($\chi^2(463, n = 297) = 4,113.33$, $p < .001$) was significant, indicating that the model did not adequately account for the observed covariation among the variables (Munro, 2005). The value of RMSEA indicates that the average residual correlation was .09, which is within the range of reasonable errors of approximation for the population (MacCallum, Browne, & Sugawara, 1996). Other fit indices are often considered indicative of a good fit, particularly the NFI (.96),

Table 2. Comparison of the CBSEI-C32 Subscale Scores Between Mainland Chinese and Hong Kong Women

| Studies	OE-16, Mean (SD)	EE-16, Mean (SD)
Hong Kong, Ip et al. (2008)		
All the women (n = 293)	106.46 (24.35)	103.08 (23.08)
Primigravida (n = 155)	107.69 (23.89)	99.53 (23.25)
Multigravida (n = 138)	105.15 (25.01)	107.16 (22.33)
Mainland China, Present study		
All the women (n = 297)	127.56 (23.00)	124.56 (24.65)
Primigravida (n = 242)	126.94 (23.24)	119.10 (24.40)
Multigravida (n = 55)	139.07 (17.95)	139.76 (19.64)

Note: OE-16, outcome expectancy subscale of the CBSEI-C32; EE-16, efficacy expectancy subscale of the CBSEI-C32; CBSEI-C32, the short form of the Chinese Childbirth Self-Efficacy Inventory.

Table 3.   Internal Consistency, Test–Retest Correlations of CBSEI-C32, and Correlations of CBSEI-C32 With CSE and CSAS (n = 297)

Scale	Cronbach's α	Guttman's Split-Half	ICC	CSE	CSAS
CBSEI-C32	.96	.93	.88*	.32*	−.21*
OE-16	.91	.86	.82*	.29*	−.21*
EE-16	.94	.87	.84*	.31*	−.19*

Note: CBSEI-C32, the short form of the Chinese Childbirth Self-Efficacy Inventory; OE-16, outcome expectancy subscale of the CBSEI-C32; EE-16, efficacy expectancy subscale of the CBSEI-C32; ICC, intraclass correlation coefficient; CSE, Chinese Self-Efficacy Scale; CSAS, Chinese Self-Rating Anxiety Scale.
*$p < .01$.
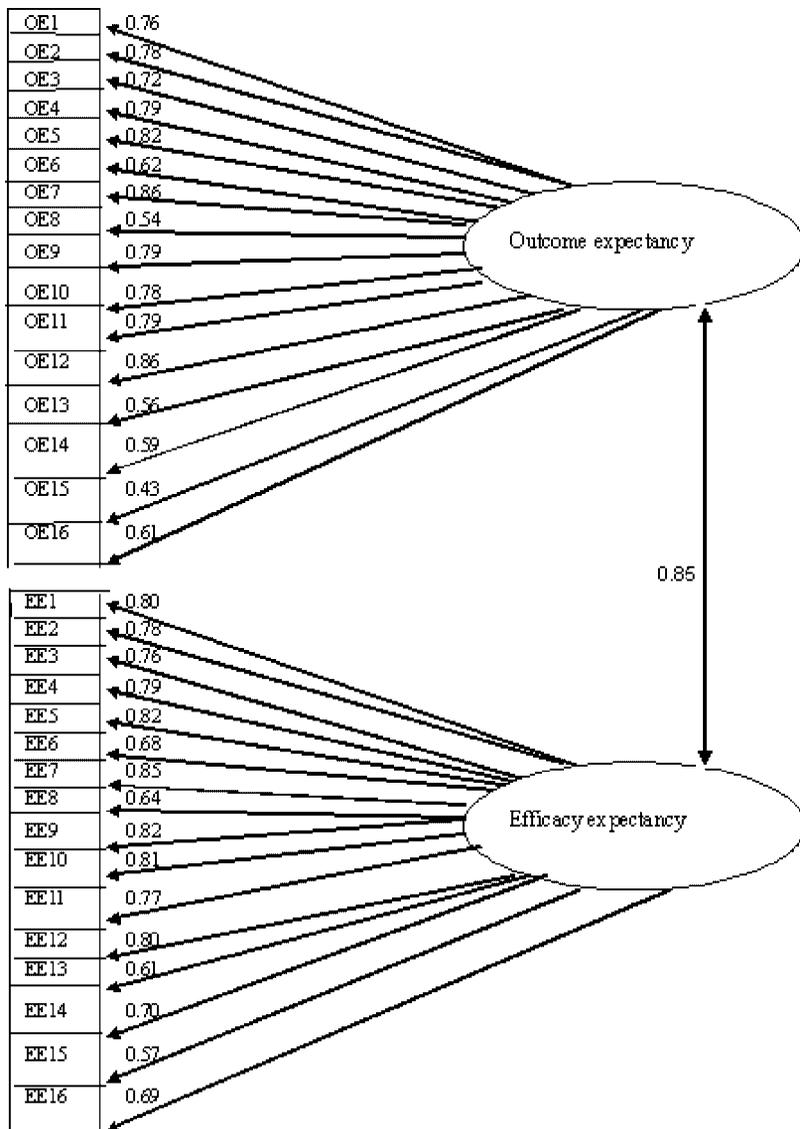
FIGURE 1.   Confirmatory factor analysis of the two-factor model of the CBSEI-C32.

NNFI (.97), CFI (.97), and IFI (.97; Kline, 2005; Marsh, Balla, & Hau, 1996), in the case of large samples.

Concurrent Validity

The CBSEI-C32 total score correlated positively with the CSE and correlated negatively with the CSAS. Both the OE-16 and the EE-16 subscales also correlated positively with the CSE and correlated negatively with the CSAS, which supported the construct validity of the CBSEI-C32. These values are provided in Table 3.

Relationship of Parity to CBSEI-C32 Scores

As shown in Table 4, significant parity effects were demonstrated; multigravid women reported higher OE-16, EE-16, and CBSEI-C32 total scores than did primigravid women, providing evidence supportive of the construct validity of the CBSEI-C32. These values are shown in Table 4.

DISCUSSION

Findings from the psychometric testing offer support for the CBSEI-C32 as a valid and reliable tool for the assessment of childbirth self-efficacy among pregnant women in mainland China. The CBSEI-C32 has acceptable internal consistency, with the Cronbach's alpha exceeding the criteria of .80 for the total scale. The OE and EE subscales correlated strongly with each other indicating a satisfactory degree of homogeneity among all items. The high ICCs for the total scale and subscales demonstrated a strong stability of the CBSEI-C32 over time.

CFA showed some support for the two-factor structure of the CBSEI-C32, reflecting the two dimensions of OE and EE consistent with the original factor structure identified in previous research (Ip et al., 2008). The findings of the χ^2 in CFA and the high correlations ($r = .85$, $p < .01$) between the two dimensions may reflect the duplicated nature of the variables in the two subscales (Stevens, 2009). Continued research is needed to clarify the homogeneity within and distinctiveness between the two factors of the CBSEI-C32 (Portney & Watkins, 2000). It could be that, in the end, the instrument will collapse into one scale with a single dimension.

We have not compared this study with previous studies in Western countries (Drummond & Rickwood, 1997; Lowe, 1993; Sinclair & O'Boyle, 1999) because the western studies used the original Childbirth Self-Efficacy Inventory to evaluate women's abilities to cope with labor. Compared with the previous study in Hong Kong, the majority of the participants in this study were primigravidas, largely due to the one child policy in mainland China. The mean score of the CBSEI-C32 for pregnant women in mainland China was higher than the CBSEI-C32 mean for pregnant women in Hong Kong (Ip et al., 2008). This may be related to the high rate of antenatal class attendance in mainland China. A previous study demonstrated that antenatal education has a beneficial effect on confidence in pregnant women (Spinelli, Baglio, Donati, Grandolfo, & Osborn, 2003). Any pregnant woman due to give birth in the study hospital is required to attend the antenatal classes. Thus all the participants in this study had attended the antenatal classes, while only 48.12% of the participants had attended antenatal classes in the Hong Kong based study (Ip et al., 2008).

The relatively high scores of the CBSEI-C32 may also reflect the reality that pregnant women in mainland China had higher levels of confidence in their ability to cope with childbirth. Compared with pregnant Hong Kong Chinese women, who

Table 4. Differences in Mean Scores of CBSEI-C32, OE-16, and EE-16 Between the Primigravid and Multigravid Women

| | Mean ± SD | | | | | 95% CI | |
	Primigravida, $n = 242$	Multigravida, $n = 55$	Mean Difference	t	p	Lower	Upper
CBSEI-C32	245.80 (45.52)	280.30 (35.42)	−34.49	−5.27	<.001	−47.38	−21.60
OE-16	126.94 (23.24)	139.07 (17.95)	−14.14	−4.23	<.001	−20.71	−7.56
EE-16	119.10 (24.40)	139.76 (19.64)	−18.66	−5.29	<.001	−25.60	−11.72

Note: CBSEI-C32, the short form of the Chinese Childbirth Self-Efficacy Inventory; OE-16, outcome expectancy subscale of the CBSEI-C32; EE-16, efficacy expectancy subscale of the CBSEI-C32.

can have a subsidy of more than 90% when using health care services (Yuk & Wong, 2009) and have their partner's support during labor and delivery (Ip, 2000), the women in mainland China may have to depend on themselves during labor and delivery. One previous study showed that what motivates women in mainland China to endure pain is their self-efficacy for childbirth (Kartchner & Callister, 2003). Further local qualitative studies on the factors associated with perceived self-efficacy in childbirth are warranted.

As predicted, the CBSEI-C32 correlated positively with the CSE and negatively with the CSAS, providing evidence supporting the construct validity of the CBSEI-C32. Consistent with Bandura's (1997) self-efficacy theory, a strong belief in one's efficacy to exercise control over one's physical condition serves as a psychological indicator of a person's level of health functioning. The negative relationship between childbirth self-efficacy and anxiety is consistent with previous findings that belief that one can exercise some control over one's physical function is also accompanied by less mood disturbance and better psychological well-being (Bernal, Woolley, Schensul, & Dickinson, 2000; Tsay, 2003). The results suggest the importance of childbirth self-efficacy in promoting coping abilities for labor and enhancing the emotional well-being of pregnant women.

The parity differences observed for the CBSEI-C32, with multigravid women scoring significantly higher than the primigravid women, are consistent with the theoretical construct of the CBSEI-C32 (Bandura, 1997). According to Bandura (1997), the direct experience of any event, such as childbirth, is a powerful source of information that influences perceptions of efficacy beliefs. Women who have had positive previous experiences in labor are likely to have a higher perceived self-efficacy for a forthcoming birth and to report a positive childbirth experience (Slade, MacPherson, Hume, & Maresh, 1993). However, this result is different from the Ip et al. (2008) study, in that only EE-16 scores differentiated primigravid women from multigravid women. Further research is needed to explore the discriminant validity of the subscale of EE-16.

The strengths of this study include a large sample size, fulfilling the requirement of 5 or more participants per item for factor analysis. However, the majority of the samples were well educated, married, and middle-class, thus generalization of the results is limited. In further studies, the psychometric properties of the CBSEI-C32 should be explored in a less literate, more rural and varied socio-economic sample.

The CBSEI-C32 shows promise for use as a measure of childbirth self-efficacy among pregnant women in mainland China. It may be possible to use the CBSEI-C32 in antenatal health care for identifying women with low perceived self-efficacy who will need extra support during labor. In addition, the CBSEI-C32 could be used by midwives at the bedside as a measure of maternal perceptions in need of reinforcement. Further, the CBSEI-C32 provides healthcare professionals with a useful tool for design and evaluation of culturally appropriate interventions that foster self-efficacy for childbirth. Effects of intervention strategies, such as providing opportunities especially for the primigravid woman to model, role play, and practice childbirth coping skills, including breathing, relaxation, distraction, and cognitive restructuring of pain, to facilitate the development of self-efficacy for childbirth could be evaluated with the instrument. The achievement of greater self-efficacy for childbirth may help reduce anxiety and pain in labor.

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