International Journal of Nursing Sciences 11 (2024) 106–112

HOSTED BY

Contents lists available at ScienceDirect

International Journal of Nursing Sciences

journal homepage: http://www.elsevier.com/journals/international-journal-of-nursing-sciences/2352-0132

Research Paper

Translation and psychometric testing of the Chinese version of the Perinatal Missed Care Survey

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ARTICLE INFO

Article history:
Received 7 August 2023
Received in revised form
5 November 2023
Accepted 11 December 2023
Available online 13 December 2023

Keywords:
Midwife
Missed nursing care
Perinatal care
Reliability
Surveys and questionnaires
Validity

ABSTRACT

Objective: This study aimed to translate and evaluate the psychometric properties of the Perinatal Missed Care Survey in China.
Methods: The Perinatal Missed Care Survey was translated according to the guidelines of the cross-cultural debugging scale recommended by the American Academy of Orthopaedic Surgeons Evidence-Based Medicine Committee, including forward translation, back translation, cultural adaption, and content validation, and its Chinese version was used in a cross-sectional study conducted from February to April in 2023. A total of 491 midwives from 14 different level hospitals in southwest China were recruited through a convenience sampling method. The discrimination ability of the items was tested through item analysis, and construct validity was assessed through exploratory factory and confirmatory factor analyses. The content validity index and Cronbach's α coefficients evaluated content validity and reliability, respectively.
Results: The Chinese version's item–total correlation coefficients ranged from 0.641 to 0.866 in part A and from 0.644 to 0.819 in part B ($P < 0.001$). Parts A and B's scale-level content validity indexes were 0.95, and the item-level content validity indexes were from 0.86 to 1.00. The three common factors of part A (necessary care, basic care, and postnatal care) and part B (communication, labor resources, and material resources) were extracted, accounting for 70.186% and 71.984% of the total variance, respectively. Confirmatory factor analysis indicated that the good fit of the three-factor models was acceptable. The Cronbach's α coefficients were 0.968 (part A) and 0.940 (part B).
Conclusion: The Chinese version of the Perinatal Missed Care Survey is a reliable and valid instrument for assessing nursing care missed by midwives during labor and birth and the reasons it was missed. Studies with large sample sizes are needed to verify the instrument's applicability in China.

What is known?

- Missed nursing care has become a common problem worldwide and negatively impacts patient-, nurse-, and organization-related outcomes.

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Peer review under responsibility of Chinese Nursing Association.

https://doi.org/10.1016/j.ijnss.2023.12.006

- The Missed Nursing Care (MISSCARE) Survey, a tool for measuring missed nursing care, was developed in 2009. It is well accepted and translated into different languages.
- In 2019, the MISSCARE survey was adjusted to be suitable for the maternity care setting, namely, the Perinatal Missed Care Survey, which has good reliability and validity.

What is new?

- Using a rigorous procedure, we translated the Perinatal Missed Care Survey from English into Chinese and verified its validity and reliability.
- Nurse managers can use this instrument to evaluate the missed nursing care during labor and birth and the reasons that care is missed.

1. Introduction

Missed nursing care is defined as essential care that is delayed, partially completed, or not completed [1]. This concept is also called "unfinished care," "implicitly rationalized care" [2], or "error of omission" [3]. For more than a decade, missed nursing care has become increasingly frequent. Given that it may negatively impact patient-, nurse-, and organization-related outcomes, it has become a major cause of concern in recent years.

Missed nursing care is a common problem worldwide. A cross-sectional study including 1,310 nurses in Turkey revealed that the mean score of missed nursing care was 2.93 on a scale of 1–4, indicating a high level of missed nursing care [4]. In Malaysia and Iran, the overall scores of missed nursing care were 1.88 and 2.57, respectively, on a scale of 1–5 [5,6]. The percentage of nurses who reported missing at least one nursing care item ranged from 36% to 74.6% [6–9]. Missed nursing care was associated with negative patient outcomes, including decreased patient satisfaction, medication errors, urinary tract infections, patient falls, pressure ulcers, critical incidents, reduced quality of care, and patient readmission [10].

Moreover, missed nursing care can affect nurses negatively and has been linked to poor job satisfaction, increased tendency to turn over, low levels of career calling, and compassion competence [11–14]. Nurses with burnout and decreased job satisfaction were more likely to leave necessary nursing care undone [15]. Clark et al. [16] revealed that 84.5% of nurses with burnout and 72.6% with job dissatisfaction reported missed nursing care. In addition, Janatolmakan et al. [17] indicated that missed nursing care can impact patients, nurses, and hospitals.

In 2009, Kalisch and Williams [18] proposed a tool for measuring missed nursing care, namely, the Missed Nursing Care Survey (MISSCARE Survey). The MISSCARE Survey consisted of two parts to measure what nursing care was missed (part A) and the reason for the missed care (part B). Part A contains 22 items, which rated on a five-point Likert rating scale ranging from "rarely = 1" to "non-applicable = 5". Part B contains 16 items with three dimensions of communication, labor resources, and material resources, which was rated on a four-point Likert rating scale ranging from "not a reason for missed nursing care = 1" to "significant factor = 4". Part A and part B of the MISSCARE Survey can be used independently. The severity of nursing care missed, and the importance of the reason identified increase with the scores of the MISSCARE Survey, which is accepted by respondents and has been translated into different languages, including Turkish [19], Icelandic [20], Swedish [21], Persian [22], Danish [23], Arabic [24], and Chinese [25]. Moreover, the MISSCARE Survey has been applied to the pediatric setting [26,27] and operation room setting [28]. Patient safety is an important issue in health care, and ensuring patient safety is the foundation and focus of nursing practice and quality nursing care. Patient engagement is an important component of patient safety and quality nursing care. In 2014, Kalisch et al. [29] designed the MISSCARE Survey-Patient to quantify the types and frequency of missed nursing care reported by hospitalized patients. This version has been translated into Chinese [30] and Turkish [31]. Different survey versions have been developed for patients with cancer [32].

Missed nursing care is evident across clinical departments and countries but is more frequent in obstetric and gynecologic wards than in neonatal intensive care units. Simpson et al. [33] conducted a qualitative study to explore the potential effects of missed nursing care during labor and birth and found that potential outcomes include cesarean delivery, depression in infants at birth, hemorrhage, and negative impact on patient satisfaction, breastfeeding, and overall patient experience. Therefore, effective interventions should be undertaken to reduce missed nursing care. However, the frequency and reasons for missed nursing care should be explored before interventions are implemented. Given that differences among units for missed nursing care had been determined, Simpson et al. [34] adapted the MISSCARE Survey in the maternity care setting to test the types of nursing care missed by midwives and why care is missed during labor and birth. The modified version of the MISSCARE Survey, the Perinatal Missed Care Survey, comprises 25 items (part A) and 16 items (part B). Simpson et al. [35] used the Perinatal Missed Care Survey in a survey and found that skin-to-skin care, breastfeeding within 1 h of birth, and appropriate recovery care are occasionally missed. Missed nursing care is independently associated with exclusive breast milk feeding. Lyndon et al. [36] confirmed the reliability and validity of the Perinatal Missed Care Survey in a large-scale study and demonstrated that it is valid and reliable. However, the Chinese version of the survey is lacking. Thus, this study aimed to translate the survey into Chinese, cross-culturally adapt the translated version and determine its psychometric properties.

2. Methods

2.1. Study design

This is a psychometric study with a descriptive–analytical, cross-sectional design. It was conducted in two stages. First, the Perinatal Missed Care Survey was translated from English into Chinese according to the guidelines of the cross-cultural debugging scale recommended by the American Academy of Orthopaedic Surgeons Evidence-Based Medicine Committee (AAOS); forward translation, back translation, cultural adaption, and content validation were performed [37]. Second, the reliability and validity of the Chinese version were validated through a cross-sectional study.

2.2. Ethical considerations

Permission for translating the survey into Chinese was obtained from the original author, and the study was approved by the ethics committee of the Chengdu Women's and Children's Central Hospital on January 20, 2022 (approval number: 2022 [3]).

2.3. Translation procedure

The guidelines of the cross-cultural debugging scale recommended by the AAOS include the guidelines for forward translation, backward translation, cultural adaptation, and content validity [37].

In forward translation, two bilingual translators with post-

graduation qualifications and specialized in nursing translated the Perinatal Missed Care Survey [36] from English into simplified Chinese. The resulting translations were compared and combined into a comprehensive version. Second, backward translation was performed by two other bilingual translators who needed to learn about the original English version and translated the Chinese version into English. We compared the back-translated versions with the original version and modified the wording to align it with the Chinese culture. Then, agreement on the preliminary version of the simplified Chinese version was reached through an online meeting, which all the translators and researchers attended. Third, six experts in nursing management, maternity care, and medical English were invited to participate in the study. They evaluated each item of the preliminary version regarding clarity of expression, conceptual equivalence, and content relevance through an expert consultation letter we designed. According to the consultation and opinion of experts, three items ("Assist women to the shower or tub for hydrotherapy," "Medications administration within 30 min before or after the scheduled time," "Patient teaching about signs and symptoms, when to call after discharge from obstetric triage") were removed from part A, and two items, namely, "Provide nonpharmaceutical or pharmaceutical interventions for pain for pregnant and postpartum women (e.g., Lamaze breathing, doula, epidural analgesia)," and "Implement medical orders within scheduled time" were added to part A. One item, "Inadequate number of assistive personnel (e.g., nursing assistants, obstetric technicians)," was removed from part B.

The simplified Chinese version of the Perinatal Missed Care Survey was tested through convenience sampling implemented in a pilot trial involving 52 midwives employed in birthing rooms in Chengdu. According to the feedback, no revision was made, and a tentative version with 24 items in part A and 15 items in part B was created.

2.4. Psychometric testing

2.4.1. Study setting and participants

Convenience sampling was used to recruit participants from hospitals in southwest China (primarily from Sichuan, with some from Chongqing, Guizhou, Yunnan, etc.) between February and April 2023. The inclusion criteria were midwives who a) worked in a birthing room for more than six months, b) provided direct care to pregnant women, and c) were willing to participate in this survey. During the study, midwives on sick, personal, or maternity leave were excluded. The sample size required was at least five times the number of items in the scale used for psychometric analysis [38]. The Chinese version of the Perinatal Missed Care Survey had 39 items; thus, the sample size of this survey was at least 195 participants. The effective sample size of this study met the minimum requirements.

2.4.2. Measurements

General information, including age, gender, hospital grade, hospital area, education level, marital status, and working year, was collected by a self-made questionnaire.

The tentative version of the simplified Chinese Perinatal Missed Care Survey was used with 24 items (rated on a five-point Likert scale ranging from "never = 1" to "always = 5") in part A and 15 items (rated on a 4-point Likert rating scale ranging from "not a reason for missed nursing care = 1" to "significant factor = 4") in part B.

2.5. Data collection

The aim and significance of the study were introduced to the directors of nursing departments or head nurses of birthing rooms in primary, secondary, and tertiary hospitals in southwest China online or face-to-face. They were then encouraged to recruit potential participants. Participation in the survey was voluntary and anonymous. After informed consent was obtained, the questionnaire formed through the Questionnaire Star platform (https://www.wenjuan.com/) was sent to eligible participants. We required the participants to answer each questionnaire item to ensure the data was received and incompletely answered questionnaires were not included in the analysis.

2.6. Data analysis

Data analysis was conducted using SPSS Version 23.0 (SPSS, IBM Corp, Armonk, NY, USA) and Amos Version 23.0 (IBM Corp, Armonk, NY). Statistical significance was set at $P < 0.05$. Continuous variables with normal distribution were presented as mean and standard deviation, non-normal continuous variables as median and interquartile range (IQR), and categorical variables as frequencies and percentages. Normal distribution was confirmed using the Shapiro–Wilk test, histograms, and Q–Q plots. Cronbach's α coefficient was used in testing internal consistency reliability. Cronbach's α coefficient of 0.7 or higher indicated reliability [39]. The item–total correlation coefficient and extreme group comparison were used in assessing the discrimination ability of the Chinese version of the Perinatal Missed Care Survey. An item with a correlation coefficient below 0.4 or a critical ratio (CR) less than three was deleted [40].

Content validity was confirmed by an expert-judgment-based method. The content validity index (CVI) was calculated for the assessment of the item-level CVI (I-CVI) and scale-level CVI (S-CVI). In this study, seven experts were invited to rate the relevance of each item on a 4-point Likert scale with scores ranging from 1 (irrelevant) to 4 (highly relevant). The criteria for good content validity were $\geq$0.78 for I-CVI and $\geq$0.90 for S-CVI [41].

Construct validity was tested through confirmatory factor analysis (CFA) and exploratory factor analysis (EFA). Raw data were randomly divided into two parts. Part 1 included 244 participants and was used for EFA, and part 2 included 247 participants and was used for CFA. Before factor analysis, Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy and Bartlett's spherical test were conducted. The EFA with rotation within the exploratory structural equation modeling framework was used to extract a common factor with eigenvalue >1 and factor loading $\geq$0.4 [42]. The CFA with maximum likelihood estimation was performed, and in CFA, $\chi^2/df < 3$. Comparative fit index (CFI) > 0.9, Tucker–Lewis index (TLI) > 0.9, incremental fit index (IFI) > 0.9, and root mean squared error of approximation (RMSEA) < 0.1 were used in examining the goodness of fit of models [43–46].

3. Results

3.1. Participants' characteristics

A total of 491 completed questionnaires were collected. The participants' median age was 32 years (P_{25}–P_{75}: 29–38; IQR: 9). Of the 491 participants, 485 (98.8%) were females, 356 (72.5%) were from tertiary hospitals, 453 (92.3%) were from Sichuan. In this study, 382 (77.8%) had undergraduate degrees or above, 406 (82.7%) were married, and 240 (48.9%) had more than eleven years of working experience (Table 1).

3.2. Item analysis

The item–total correlation coefficients of the Chinese version of

Table 1
Demographic characteristics of the participants ($n = 491$).

Variables	n (%)
Gender	
Female	485 (98.8)
Male	6 (1.2)
Hospital grade	
Primary	8 (1.6)
Secondary	127 (25.9)
Tertiary	356 (72.5)
Hospital area	
Sichuan	453 (92.3)
Chongqing	12 (2.4)
Others	26 (5.3)
Education level	
College and below	109 (22.2)
Undergraduate	379 (77.2)
Master's degree and above	3 (0.6)
Marital status	
Unmarried	76 (15.5)
Married	406 (82.7)
Others	9 (1.8)
Working years	
≤5	89 (18.1)
6–10	162 (33.0)
11–20	140 (28.5)
≥21	100 (20.4)

the Perinatal Missed Care Survey ranged from 0.641 to 0.866 in part A and from 0.644 to 0.819 in part B ($P < 0.001$). The CR values were higher than 3, and no item was removed. The results are shown in Tables 2 and 3.

3.3. Validity test

3.3.1. Content validity

The content validity of the Chinese version of the Perinatal Missed Care Survey was appraised by a panel of experts in maternity care. The seven experts had at least a bachelor's degree in nursing. Of the seven experts, three were associate chief nurses, and two were chief nurses. The experts' mean age was 48.85 years, and they had ten years of clinical working experience or more. The I-CVI of parts A and B ranged from 0.86 to 1.0, and no item was removed. The S-CVIs of parts A and B were 0.95, suggesting acceptable content validity.

Table 2
Item analysis of part A in the Chinese version of the Perinatal Missed Care Survey.

Items	Pearson Correlation	P	Extreme group comparison	P
	Item–total correlation		Critical ratio (CR)	
AQ1	0.700	<0.001	18.162	<0.001
AQ2	0.721	<0.001	21.233	<0.001
AQ3	0.784	<0.001	14.522	<0.001
AQ4	0.641	<0.001	16.624	<0.001
AQ5	0.786	<0.001	17.035	<0.001
AQ6	0.783	<0.001	23.348	<0.001
AQ7	0.732	<0.001	21.863	<0.001
AQ8	0.735	<0.001	13.316	<0.001
AQ9	0.739	<0.001	9.033	<0.001
AQ10	0.809	<0.001	22.488	<0.001
AQ11	0.818	<0.001	21.112	<0.001
AQ12	0.737	<0.001	18.772	<0.001
AQ13	0.702	<0.001	19.031	<0.001
AQ14	0.844	<0.001	16.122	<0.001
AQ15	0.824	<0.001	17.733	<0.001
AQ16	0.819	<0.001	14.676	<0.001
AQ17	0.806	<0.001	16.842	<0.001
AQ18	0.866	<0.001	17.927	<0.001
AQ19	0.835	<0.001	14.798	<0.001
AQ20	0.841	<0.001	15.120	<0.001
AQ21	0.822	<0.001	19.227	<0.001
AQ22	0.697	<0.001	19.049	<0.001
AQ23	0.767	<0.001	17.323	<0.001
AQ24	0.797	<0.001	20.239	<0.001

3.3.2. Structural validity

EFA was performed to explore the initial structures of parts A and B and repeated each time an item was deleted. Principal component analysis with varimax rotation was used to extract factors. For part A, one item ("Provide nonpharmaceutical or pharmaceutical interventions for pain for pregnant and postpartum women," e.g., Lamaze breathing, doula, and epidural analgesia) was removed. The KMO coefficient was 0.956, and Bartlett's test was significant ($\chi^2 = 5126.184$, $df = 253$, $P < 0.001$), which supported factor analysis. Three common factors (necessary care, basic care, and postnatal care) were extracted, which accounted for 70.186% of the total variance. The factor loading of each item was between 0.523 and 0.846. For part B, two items, namely, "Nursing staff is not in the unit or not available (nursing staff including nurses and midwives," and "Inadequate handoff from previous shift or sending unit," were deleted. The KMO coefficient was 0.908, and Bartlett's test was significant ($\chi^2 = 2204.251$, $df = 78$, $P < 0.001$). Three common factors (communication, labor resources, and material resources) were extracted, which accounted for 71.984% of the total variance. The factor loading of each item was between 0.510 and 0.844. The results are shown in Tables 4 and 5.

Based on the EFA results and three-factor structure, the factorial validity of parts A and B was evaluated through CFA. The initial fitting indexes did not meet the criterion, and the final results after modification indicated the model's fitness. Details are shown in Table 6, Appendix A, and Appendix B.

3.4. Reliability

The Cronbach's α coefficients of parts A and B were 0.968 and 0.940, respectively, which indicated acceptable reliability. In addition, the Cronbach's α coefficients for the three factors of part A were 0.963, 0.912, and 0.865, and the Cronbach's α coefficients for the three factors of part B were 0.900, 0.924, and 0.876, which indicated that all the factors had good reliability.

4. Discussion

We translated the Perinatal Missed Care Survey from English into simplified Chinese and measured the psychometric properties of the Chinese version of the Perinatal Missed Care Survey in 491 Chinese midwives in southwest China. The discrimination ability, content validity, construct validity, and internal consistency reliability were tested, and the results showed that the Chinese version is psychometrically sound.

All the item–total correlation coefficients were above 0.4, and all the CR values were higher than 3, which showed good discrimination ability. The I-CVIs of part A and part B were higher than 0.86, and their S-CVIs indicated acceptable content validity (both 0.95). Simpson et al. [34,36] adapted the MISSCARE Survey to the maternity setting; however, the results of the original version of the Perinatal Missed Care Survey in phases one and two did not report content validity. Hosseini et al. [22] translated the MISSCARE Survey into Persian and randomly recruited 300 nurses in five different units; parts A and B had content validity of 0.944 and 0.969, respectively, which were almost consistent with our findings. Bagnasco et al. [26] adapted the MISSCARE Survey to the pediatric setting and reported that the S-CVI was 0.88 and the I-CVIs were 0.60–0.97 [26]. The S-CVIs of a Turkish version of the MISSCARE Survey (Pediatric version) were 0.88 (part A) and 0.90 (part

Table 3
Item analysis of part B in the Chinese version of the Perinatal Missed Care Survey.

Items in part B	Pearson Correlation	*P*	Extreme group comparison	*P*
	Item-total correlation		Critical ratio (CR)	
BQ1	0.644	<0.001	14.889	<0.001
BQ2	0.699	<0.001	18.544	<0.001
BQ3	0.671	<0.001	17.535	<0.001
BQ4	0.722	<0.001	20.934	<0.001
BQ5	0.748	<0.001	25.237	<0.001
BQ6	0.770	<0.001	21.250	<0.001
BQ7	0.741	<0.001	21.498	<0.001
BQ8	0.774	<0.001	22.493	<0.001
BQ9	0.774	<0.001	22.963	<0.001
BQ10	0.797	<0.001	23.135	<0.001
BQ11	0.771	<0.001	18.560	<0.001
BQ12	0.732	<0.001	20.654	<0.001
BQ13	0.742	<0.001	21.583	<0.001
BQ14	0.747	<0.001	28.317	<0.001
BQ15	0.819	<0.001	28.071	<0.001

Table 4
Exploratory factor analysis of the Chinese version of the Perinatal Missed Care Survey (Part A).

Items of part A	Necessary care	Basic care	Postnatal care
AQ3	**0.577**	0.593	0.130
AQ5	**0.600**	0.464	0.322
AQ8	**0.716**	0.193	0.212
AQ9	**0.775**	0.120	0.287
AQ13	**0.708**	0.451	0.243
AQ14	**0.706**	0.350	0.292
AQ15	**0.834**	0.267	0.246
AQ16	**0.709**	0.389	0.168
AQ17	**0.727**	0.439	0.293
AQ18	**0.790**	0.388	0.202
AQ19	**0.765**	0.347	0.278
AQ20	**0.632**	0.380	0.413
AQ1	0.310	**0.734**	0.119
AQ2	0.267	**0.783**	0.153
AQ4	0.225	**0.657**	0.226
AQ6	0.318	**0.621**	0.460
AQ7	0.250	**0.638**	0.417
AQ10	0.417	**0.566**	0.419
AQ11	0.496	**0.523**	0.423
AQ12	0.315	**0.525**	0.354
AQ21	0.186	0.255	**0.846**
AQ22	0.421	0.196	**0.712**
AQ23	0.382	0.363	**0.670**
Eigen value	59.917	5.944	4.324
Variance, %	32.184	22.816	15.140

Table 5
Exploratory factor analysis of the Chinese version of the Perinatal Missed Care Survey (Part B).

Items of part B	Communication	Labor resources	Material resources
BQ1	**0.836**	0.040	0.247
BQ2	**0.758**	0.093	0.387
BQ3	**0.750**	0.319	0.208
BQ4	**0.510**	0.330	0.407
BQ5	**0.640**	0.470	0.247
BQ6	**0.630**	0.451	0.081
BQ10	0.167	**0.844**	0.190
BQ11	0.282	**0.749**	0.218
BQ12	0.154	**0.636**	0.460
BQ13	0.234	**0.663**	0.510
BQ7	0.304	0.278	**0.828**
BQ8	0.331	0.297	**0.805**
BQ9	0.242	0.237	**0.805**
Eigen value	54.930	9.553	7.500
Variance, %	25.767	23.259	22.958

Table 6
Factor analysis goodness-of-fit statistics for the CFA.

The questionnaire	χ^2	*df*	χ^2/df	CFI	TLI	IFI	RMSEA
Part A							
Unrevised three-factor	944.211	227	4.160	0.872	0.858	0.873	0.113
Revised three-factor	634.268	221	2.911	0.925	0.914	0.925	0.088
Part B							
Unrevised three-factor	316.669	62	5.108	0.908	0.885	0.090	0.129
Revised three-factor	169.453	57	2.973	0.960	0.945	0.960	0.090

Note: CFA = confirmatory factor analysis. CFI = comparative fit index. TLI = Tucker–Lewis index. IFI = incremental fit index. RMSEA = root mean squared error of approximation.

B) [27]. The content validity index in these studies was lower than our study's.

The construct validity of the Chinese version of the Perinatal Missed Care Survey was tested for parts A and B by EFA, and factors for part A (necessary care, basic care, postnatal care) and part B (communication, labor resources, and material resources) were extracted. In previous studies [18,34], EFA was not performed for part A. In our study, EFA was conducted. The KMO coefficient was 0.956, and Bartlett's test was significant ($\chi^2 = 5126.184$, $df = 253$, $P < 0.001$), which supported factor analysis. Part A had 23 items, whereas part B had 13, and each load value was greater than 0.4. They accounted for 70.186 % and 71.984 % of the total variance. The Persian version of the MISSCARE survey extracted three factors (necessary care, secondary care, and supportive care) of part A and five factors (communication, labor resources, material resources, responsibility, and unpredictable situations) of part B, but this study did not perform EFA [22]. In the study of Simpson et al. [34], the factor analysis results of part B indicated that it had two common factors (communication and labor resources), and the factor loading of each item ranged from 0.498 to 0.954. The results were inconsistent with the three-factor solution in Kalisch and Williams's study [18]. Simpson et al. [30] proposed the presence of an unknown factor, and thus they conducted a large-scale study to test the reliability and validity of the Perinatal Missed Care Survey and extracted three common factors (communication, labor resources, and material resources), which explained 66.7% of the total variance; the item factor loads were 0.328–0.548. The EFA results in our study were higher than those of Simpson et al. [34] and Lyndon et al. [36]. In addition, the CFA results in our study showed the acceptable fit of the Chinese version of the Perinatal Missed Care Survey ($\chi^2/df < 3$, RMSEA <0.1, IFI >0.9, TLI >0.9, CF1 > 0.9). Lyndon et al. [36] evaluated the construct validity for part B via CFA, and the

results showed that the model was adequately fit (RMSEA = 0.08, SRMR 0.051, CFI = 0.92, TLI = 0.90).

The Cronbach's α coefficients of parts A and B were 0.968 and 0.940, respectively, and the dimensions of both parts were 0.865–0.963, suggesting good reliability. These results were consistent with the corresponding subscales in the study of Lyndon et al. [36]. Simpson et al. [34] reported ordinal Cronbach's α coefficients of 0.99 for part A and 0.959 and 0.963 for two dimensions in part B, which were higher than those in our findings.

The Chinese version of the Perinatal Missed Care Survey is a valid and reliable tool for measuring missed nursing care during labor and birth and determining the reasons that nursing care is missed. In clinical practice, nurse managers can use this instrument to assess the types and frequency of nursing care missed by midwives and the reasons that care is missed. However, our study had limitations. First, our study sample comprised midwives mainly recruited from Sichuan, China. The participants were not evenly distributed and may not represent other populations. These limitations may have affected the generalizability of the study results. Second, test–retest reliability was not evaluated. Future studies should consider them to achieve robust validity and reliability. Third, specific scores from this version were not calculated.

5. Conclusion

In summary, the Chinese version of the Perinatal Missed Care Survey showed good reliability and validity. It can be used to evaluate missed nursing care during labor and birth and determine why care is missed. It may enable nursing managers to ensure patient safety and improve the quality of care and the satisfaction of the nursing staff.

Funding

This research was funded by the Research Project on Nursing Discipline of the Journal of the Chinese Medical Association (CMAPH-NRD2022033). We state that the funding organization has had no role in the survey's design, implementation, and analysis.

CRediT authorship contribution statement

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Declaration of competing interest

The authors declare that they have no competing interests.

Acknowledgments

The authors wish to acknowledge Dr. Simpson who authorized and provided the original scale of the Perinatal Missed Care Survey, all experts who helped us during translation and content validity, and all midwives who participated in this study.

Appendices. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ijnss.2023.12.006.

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