RESEARCH ARTICLE

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Nursing-sensitive quality indicators for pernicious placenta previa in obstetrics: A Delphi study based across Chinese institutions

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Abstract

Aim: To identify a set of scientific, systematic and clinically applicable nursing-sensitive quality indicators for pernicious placenta previa (PPP).

Design: A modified Delphi-Consensus Technique.

Methods: According to literature retrieval published between 2009–2019, 38 nursing-sensitive quality indicators were chosen and a questionnaire was designed. An online survey was conducted in 20 hospitals in China, and data of experts' opinions were collected and analysed by improved Delphi method.

Results: 38 nursing-sensitive quality indicators were identified. The response rates in the two rounds of expert consultation were 97.4% and 100%, and the authoritative coefficients were 0.89 and 0.92. The coefficients of variation ranged from 0.04–0.28. The nursing-sensitive quality indicators were successfully constructed based on the modified Delphi technique.

KEYWORDS
modified Delphi technique, nursing-sensitive quality indicators, obstetrical nursing, pernicious placenta previa

1 | INTRODUCTION

Placenta previa is a common complication in the third trimester of pregnancy and one of the main causes of postpartum haemorrhage and perinatal death. Pernicious placenta previa (PPP) means placenta previa occurs and placenta previa is attached to the scar from the previous caesarean section during the second pregnancy for a pregnant woman with a history of caesarean section (Yu, Hu et al., 2016). PPP leads to insufficient blood supply to the placenta, inducing placental adhesion or implantation, making it difficult for the placenta to be separated from the mother during delivery. It increases the risk of postpartum bleeding and endangering the life of the mother and child (Chitkara

et al., 2020; Radwan et al., 2018; Ryu et al., 2019; Shah et al., 2020). According to the report, the incidence of placenta previa with placental implantation was 25% and 40% in women with a history of first and second caesarean sections, respectively. The caesarean section rate in China is about 45%, and the rate of placenta previa is relatively high (Boatin et al., 2018; Hicklin et al., 2019; Zhang et al., 2019). With the implementation of China's two-child policy, the rate of second pregnancy after the previous caesarean section increases, and the rate of PPP increases year by year. Therefore, the diagnosis and treatment of PPP have become a hot issue in the field of obstetrics. It is one of the severe obstetric diseases and a serious threat to the life and health of mothers and infants (Yu, Su et al., 2016).

2 | BACKGROUND

Nursing-sensitive quality indicators (NSQIs) refer to a set of principle, procedure and assessment scales that are used to quantify the level of nursing quality and to assess nursing outcomes in clinical nursing practice. NSQIs are distinct and specific to nursing, and differ from medical indicators of care quality. NSQIs have been accepted as critical measures for evaluating the quality of nursing care and improving nursing quality (Gao et al., 2018; Isis, 2007).

Research on nursing-sensitive quality indicator has been well developed in the world. In 1998, the American Nurses Association (ANA) issued 10 nursing-sensitive quality indicators (Zhang et al., 2018). In 2004, the National Quality Forum (NQF) constructed 15 items of nursing sensitive quality indicators. The nursing quality can be compared among different departments, hospitals and even countries. At present, the research in the field of obstetrics nursing-sensitive quality indicator is still in the early stage in China. The nursing-sensitive quality indicator is relatively limited, although in 2016 China issued 13 nursing-sensitive quality indicators. The research on nursing-sensitive indicator for placenta previa is not enough, and the nursing qualities lack of comparison in different hospitals, leading to the data collected not that much accurate (Chunxiu et al., 2018; Zhang et al., 2018).

Nurses represent an important group of professionals in hospitals, as nurses are involved in many important processes of patient care. However, measurement of these processes and outcome is challenging (Koch et al., 2020). Nursing-sensitive quality indicators are imperative to improve the nursing quality. In clinical practice, more attention should be paid to PPP and quality sensitive indicators of PPP should be constructed and carried out to prevent its risk at an early stage. The key to improve the nursing quality of PPP in obstetrics is to improve the evaluation method of nursing quality, construct sensitive indicators and evaluate the sensitive indicators outcome of PPP (Gao et al., 2018; Heslop & Lu, 2014; Martinez et al., 2015).

However, most of the nursing research at home and abroad mainly focus on the general sensitive indicators, and the special research on sensitive indicators for PPP is not enough. This research constructed a set of nursing-sensitive quality indicators using modified Delphi technique-based literature retrieval and our clinical practice experience. The importance of indicators, rationality of calculation formula and operability of the indicators were analysed. It provides a basis for the clinical nursing management and nursing quality evaluation of PPP.

3 | METHOD

3.1 | Design

3.1.1 | Initial construction of potential indicators

The Chinese databases and international aboard databases were used including CNKI, Wanfang Database, Weipu database and Baidu
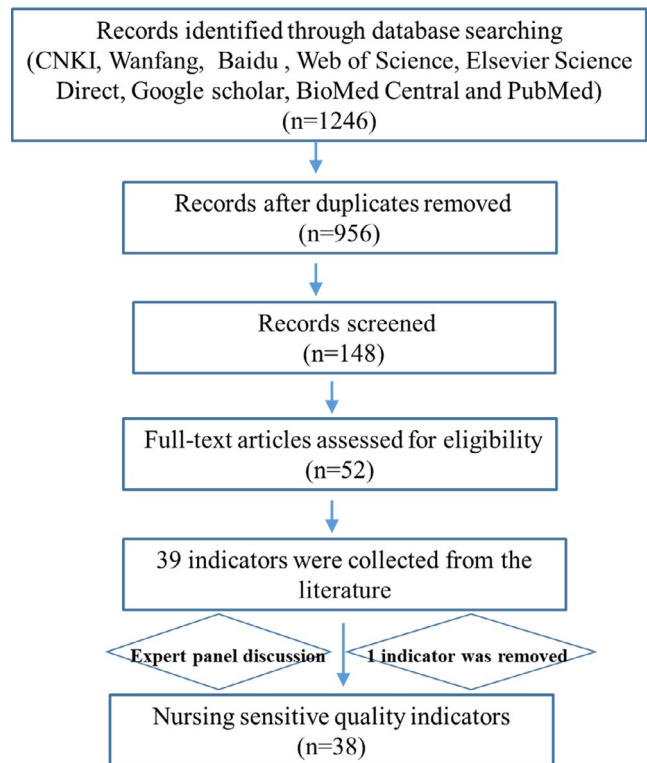

FIGURE 1 The flow chart of literature search and identifying the nursing-sensitive quality indicators

searching, Web of Science (SCI/SSCI/A&HCI/CPCI/CSCD), Elsevier ScienceDirect, BioMed Central and PubMed. Keywords were chosen as obstetric nursing, nursing-sensitive quality indicators, nursing quality indicators, obstetrics care, pernicious placenta previa and Delphi Technique. Articles published in English and Chinese languages were eligible for inclusion. 956 references were chosen from the database published between 2009–2019. Then, 52 papers were chosen as the raw materials to construct the indicators through filtering based on the article titles, abstracts and contents. The Endnote software was used to manage the references. Finally, 38 nursing-sensitive indicators were constructed for PPP. The literature review used in this paper is a narrative review (Figure 1).

3.1.2 | Delphi survey

The Delphi method is a structured communication technique that uses successive rounds of questionnaires and evaluation by a panel of experts to reach consensus on proposed items. We applied this method, including drafting two Delphi survey questionnaires to collect expert responses and to establish nursing-sensitive quality indicators based on expert evaluation and discussion. A preliminary selection of 39 nursing quality indicators was to be evaluated and discussed by the expert panel in two successive Delphi surveys until consensus was reached.

The questionnaire consists of three parts, introduction, body and experts' personal information. (a) The introduction mainly

describes the research purpose and background; (b) the questionnaire includes importance of indicators, rationality of indicators and manoeuvrability of calculation formula. According to the Likert five-point scale, 5 points means most important, 4 means much important, 3 ordinary, 2 less important, 1 least important. An indicator with 4 ~ 5 points means the expert agree with the indicator, and the expert can provide own ideas on the indicators, add or delete indicators and describe the relative reasons. (c) The experts' personal data include age, gender, position and title. It is also necessary to know how familiar to the indicators. Then, the familiarity can be used to determine the degree of authority of the experts. Research team determined the levels of the nursing quality indicator and categories and contents. Finally, the nursing quality indicator name, calculation formula and manoeuvrability of indicators were discussed which were chosen from final 52 references. Based on the "structure – process – result" nursing quality management pattern, nursing-sensitive indicators for pernicious placenta previa were provided using Delphi method, which included three first-level indicators, 6 s-level indicators and 38 third-level indicators (Liu & Zhao, 2018). The questionnaire for the first round was formed based on the indicators. After the first round of enquiry by email or WeChat, the research group had a second face-to-face discussion.

The experts' feedback and opinions were discussed and analysed item by item. The indicators with a support rate of less than 70% or variation coefficient higher than 0.3 were cancelled. The indicators were modified and a second-round questionnaire was formed.

3.2 | Participants

The research group was formed by a total of 10 members, including two associate professor of nursing, six supervisor nurses and two senior nurses. All members of the research team had a full understanding of sensitive indicators of PPP which were generally used in the world.

The qualification criteria of expert to participate in this study are as follows: from grade A general hospital or maternity hospital; with more than 5 years of clinical medical, nursing or management experience in obstetrics. The experts panel consisted of Nursing managers with titles of senior or above, and clinical obstetrics experts with title of associate professional or above. Volunteers to participate in this research should have high enthusiasm. A total of 48 experts aged between 40–60 were selected, including 29 professors (60.4%) and 19 associate professors (39.6%).

3.3 | Ethical consideration

As a quality improvement and control study, the institutional review board has approved the study and waived the need for individual informed consent by formulating a declaration of no objection. Expert panel members were informed of their right to decline to provide specific information or to terminate participation at any stage of the study without detriment. However, as the researcher knew the origin of individual responses, it was not possible to maintain total anonymity during the study. The study protocol was approved by the Ethics Committee of the Affiliated Hospital of Qingdao University, China.

3.4 | Data analysis

SPSS 19.0 statistical software was used for data processing and analysis. Descriptive analysis is expressed by mean, standard deviation, coefficient of variation (CV) and degree of identification. The coefficient of variation is used to represent the dispersion degree of expert opinions. The questionnaire recovery rate is used to show the enthusiasm of experts. The degree of expert authority is represented by the expert authority coefficient (Cr). The degree of coordination of expert opinions is reflected by the coefficient of variation (CV) and the coefficient of coordination (W). CV reflects the degree of fluctuation assigned by the expert group. The smaller the value is, the better the coordination of expert's opinions is. W reflects the coordination degree of all experts on all indicators, with a value between 0–1. The greater W is, the higher the coordination degree of expert opinions is (Liu & Zhao, 2018; Su et al., 2019).

3.5 | Validity and reliability

To ascertain validity and reliability, the Delphi studies were followed. To ensure the high representativeness, the expert panel was formed by nurses, nursing manager and clinical obstetrics experts from developed or developing cities in all over China. The experts were from 20 hospitals in more than 10 provinces or cities. Then, their opinions can represent the different medical level. The indicators were determined by a narrative review, which was followed by a Delphi survey. We chose the generalized experts from different areas, including the developed and developing cities of China, to avoid the imbalance of healthcare in China. The experts had the opportunity to suggest further indicators. Two round surveys were applied until the indicators were approved by all the experts.

4 | RESULTS

4.1 | Authority and coordination

In this study, two rounds of expert questionnaire survey were completed. In the first round, 48 questionnaires were distributed, 48 were collected and one was invalid questionnaires, with an effective recovery rate of 97.4%. In the second round, 47 copies of questionnaire were distributed, and 47 copies were collected, with an effective recovery rate of 100%. The authority coefficient Cr of two rounds of correspondence consultation is 0.89 and 0.92,

TABLE 1 Coordination degree of experts' opinions in the two round survey

Round	Sensitivity			Rationality			Feasibility		
	W	χ^2	p	W	χ^2	p	W	χ^2	p
1	0.308	110.224	<.01	0.316	113.025	<.01	0.309	110.823	<.01
2	0.336	121.258	<.01	0.328	119.246	<.01	0.326	117.382	<.01

respectively, which indicates that the experts involved in this study have high authority.

In this study, the coefficient of variation of all sensitive indicators is lower than 0.3, and the coordination degree (W) of expert opinions in the first round in the three dimensions of sensitivity, rationality and feasibility are 0.308, 0.316 and 0.309, respectively. In the second round survey, the degree of coordination (W) is 0.336, 0.328 and 0.326, respectively. This indicates that all experts have a high consensus on the research results. The degree of coordination between the two rounds of consultation is shown in Table 1.

4.2 | Survey results of nursing-sensitive quality indicators

According to the expert consultation results, the research group discussed and analysed, and finally determined the nursing-sensitive quality indicators, including three first-level indicators, 6 s-level indicators and 38 third-level indicators. The nursing-sensitive quality indicators are shown in Table 2.

In the first round enquiry, more than 82% experts agree the 28 index (4 ~ 5 points) of the 38 indicators. The indicators with the highest agreement are as follows, ratio of nurses and patients, awareness rate of nurses to the patients' illness state, ratio of patient's identification, incidence of postpartum haemorrhage, incidence of lower extremity thrombosis after operation and incidence of postoperative incision infection.

In the second round of discussion, the evaluation team analysed the results of the first round of letter consultation, focusing on the scientific nature, sensitivity, practicality and operability of the nursing quality indicator. Further modification was applied in the second round survey. Experts agree that mortality of maternal and newborn is a major indicator of obstetrics, but its incidence is extremely low, and it is not sensitive to evaluate the quality of obstetric care with very low probability outcome indicators, it is recommended to delete this indicator. After the second round of consultation, experts' recognition on the importance of items, rationality of calculation formula and operability of data collection of the adjusted indicators have been greatly improved.

5 | DISCUSSION

It is urgent to develop a unified national quality of nurse sensitive indicators for a specific disease, and explore nursing quality evaluation

system to make nursing quality evaluation more accurate and efficient. Finally, a unified national nursing quality indicators database is to be established to ensure the accuracy data collection and data sharing (Shiyu & Jiaohua, 2019).

To build nursing-sensitive quality indicators for placenta previa, it is necessary to adopt the latest international research progress and considerate the specific management system conditions in China's hospital. Combining the characteristics of obstetric care and placenta previa, the nursing-sensitive indicators can be constructed to evaluate the nursing process and nursing quality in obstetric.

Structure refers to a relatively stable medical support environment, including the allocation of medical human resources and organizational structure. In this study, structural indicators include three secondary indicators: organization and personnel, training and education, medical materials and equipment. A large number of studies have shown that the allocation of nursing human resources has a direct impact on nursing outcomes (Gunn et al., 2019; Han et al., 2018). Therefore, the nurse–patient ratio and the bed-nurse ratio become important sensitive indicators. Bed-nurse ratio reflects the matching relationship between beds and nursing staff. The reasonable bed-nurse ratio ensures the basic nursing staff of the care unit, satisfies the nursing service needs of patients and maximizes the benefit of nursing resource application. In training and education indicators, 94.74% experts believe that of the nurses' knowledge on placenta previa (4.70 + 0.58 points, variation coefficient 0.12) and operation skills examination pass rate (4.72 + 0.50 points, variation coefficient 0.11) are two important indexes. The knowledge on placenta previa can promote the nurses to pay attention to the disease and prevent from the outcome of disaster. Nurses can take appropriate measures to dispose of some emergency such as postpartum haemorrhage. The 10 level-3 sensitive indicators are similar to the nursing indicators in the United States (Chunxiu et al., 2018; Gao et al., 2018; Xia et al., 2016).

Procedural sensitive indicators include a total of 17 level-3 sensitive indicators. Among them, experts believe that patient identification (De Rezende et al., 2019) is the first and most important one in nursing work. Both the United States and China have made "patient identification" the first item of their countries' patient safety goals. Experts suggest that the rate of patient identification should be included in the general sensitivity index. The familiarity to the patients can ensure the nursing staff provide patients with targeted care measures, which was suggested to be included in the indicators.

Consequent sensitive indicators mainly include patient satisfaction and overall quality evaluation. Patient satisfaction is the direct evaluation of nursing quality. The experts agreed that the

TABLE 2 Nursing-sensitive indicators for pernicious placenta previa

Type of indicators		Significance of indicators			Rationality of formula			Feasibility of data collection		
1st and 2nd level indicators	3rd-level indicators	Score (x ± s)	CV	Degree of recognition (%)	Score (x ± s)	CV	Degree of recognition (%)	Score (x ± s)	CV	Degree of recognition (%)
Structure indicator Process indicator	Configuration of nurses at different levels	4.66 ± 0.64	0.14	92.11	4.56 ± 1.02	0.22	89.47	4.59 ± 1.02	0.22	86.84
	Nurse–patient ratio	4.72 ± 0.50	0.11	92.11	4.38 ± 1.16	0.26	89.47	4.46 ± 1.04	0.23	86.84
	Bed-nurse ratio	4.68 ± 0.62	0.13	92.11	4.52 ± 1.28	0.28	89.47	4.54 ± 1.20	0.26	86.84
	Educational level of nurse	4.65 ± 0.57	0.12	92.11	4.70 ± 1.30	0.28	89.47	4.23 ± 1.21	0.29	86.84
	Ratio of obstetric table to midwife	4.71 ± 0.56	0.12	92.11	4.64 ± 1.28	0.28	89.47	4.48 ± 1.06	0.24	86.84
	Nursing hours to patient in 24 hr	4.70 ± 0.58	0.12	92.11	4.48 ± 1.16	0.26	89.47	4.45 ± 1.05	0.24	86.84
	Training hours of nursing	4.57 ± 0.78	0.17	89.47	4.69 ± 0.78	0.17	92.11	4.70 ± 0.76	0.16	92.11
	Qualification rate of placenta previa theory knowledge	4.70 ± 0.58	0.12	94.74	4.69 ± 0.78	0.17	92.11	4.76 ± 0.54	0.11	92.11
	Qualification rate of skill assessment	4.72 ± 0.50	0.11	94.74	4.56 ± 0.64	0.14	92.11	4.80 ± 0.52	0.11	92.11
	Instrument and equipment work well	4.90 ± 0.30	0.06	100	4.76 ± 0.68	0.15	97.37	4.71 ± 0.55	0.12	92.11
	Medicine management	4.88 ± 0.32	0.07	100	4.74 ± 0.59	0.12	97.37	4.68 ± 0.54	0.12	92.11
	Nursing standard training	4.40 ± 0.70	0.16	86.84	4.56 ± 0.68	0.15	92.11	4.78 ± 0.55	0.11	92.11
	Nursing guide training	4.42 ± 0.71	0.16	86.84	4.59 ± 0.65	0.14	92.11	4.72 ± 0.50	0.11	92.11
	General nursing quality	4.59 ± 0.58	0.13	92.11	4.68 ± 0.60	0.13	94.74	4.60 ± 0.52	0.11	89.47
	Graded care quality	4.63 ± 0.67	0.14	92.11	4.73 ± 0.62	0.13	94.74	4.61 ± 0.56	0.12	89.47
	Perioperative nursing quality	4.62 ± 0.61	0.13	92.11	4.68 ± 0.60	0.13	94.74	4.59 ± 0.64	0.14	89.47
	Reaching standard rate of nursing to critical patients	4.65 ± 0.51	0.11	92.11	4.73 ± 0.48	0.10	94.74	4.64 ± 0.54	0.12	89.47
	Admission health education	4.75 ± 0.64	0.13	92.11	4.72 ± 0.60	0.13	94.74	4.69 ± 0.64	0.14	89.47
	Nursing document quality	4.34 ± 0.93	0.21	92.11	4.69 ± 0.66	0.14	94.74	4.70 ± 0.76	0.16	89.47
	First-aid treatment	4.75 ± 0.66	0.13	92.11	4.71 ± 0.60	0.13	94.74	4.70 ± 0.64	0.14	89.47
	Patients identification	4.78 ± 0.58	0.12	97.37	4.73 ± 0.48	0.10	94.74	4.65 ± 0.55	0.12	89.47
	Patient handover quality	4.47 ± 0.88	0.19	92.11	4.70 ± 0.74	0.15	94.74	4.73 ± 0.75	0.16	89.47
	Quality of pain care	4.43 ± 0.96	0.21	92.11	4.69 ± 0.78	0.17	94.74	4.72 ± 0.75	0.16	89.47
	Pipeline risk management	4.53 ± 0.61	0.13	92.11	4.73 ± 0.65	0.14	92.11	4.65 ± 0.80	0.17	94.74

(continues)

TABLE 2 (Continued)

Type of indicators		Significance of indicators			Rationality of formula			Feasibility of data collection		
1st and 2nd level indicators	3rd-level indicators	Score (x ± s)	CV	Degree of recognition (%)	Score (x ± s)	CV	Degree of recognition (%)	Score (x ± s)	CV	Degree of recognition (%)
	Urinary tract infection prevention	4.55 ± 0.64	0.14	92.11	4.77 ± 0.77	0.16	92.11	4.56 ± 0.79	0.17	94.74
	VTE assessment	4.61 ± 0.67	0.14	92.11	4.70 ± 0.50	0.11	92.11	4.62 ± 0.60	0.13	94.74
	Blood circulation observation in the distal limb of the patient's puncture	4.46 ± 0.88	0.19	92.11	4.70 ± 0.74	0.15	92.11	4.70 ± 0.75	0.16	94.74
	Early contact and sucking rate	4.60 ± 0.66	0.14	92.11	4.69 ± 0.50	0.11	92.11	4.60 ± 0.60	0.13	94.74
	Postpartum breast tenderness	4.62 ± 0.78	0.17	92.11	4.71 ± 0.73	0.15	92.11	4.68 ± 0.73	0.16	94.74
	Nurse awareness on the patient condition	4.72 ± 0.65	0.14	94.74	4.70 ± 0.60	0.13	92.11	4.66 ± 0.56	0.12	94.74
Outcome indicator	Satisfaction of patients	4.78 ± 0.42	0.09	97.37	4.89 ± 0.44	0.09	97.37	4.92 ± 0.34	0.07	92.11
	Incidence of postpartum haemorrhage	4.90 ± 0.20	0.04	100	4.75 ± 0.36	0.07	97.37	4.90 ± 0.32	0.07	97.37
	Incidence of lower extremity thrombosis	4.79 ± 0.54	0.11	97.37	4.87 ± 0.48	0.10	97.37	4.70 ± 0.54	0.11	94.74
	Incidence of postoperative falls	4.65 ± 0.68	0.15	97.37	4.60 ± 0.49	0.11	97.37	4.80 ± 0.56	0.12	94.74
	Incidence of postpartum urinary retention	4.76 ± 0.52	0.11	97.37	4.82 ± 0.54	0.11	97.37	4.87 ± 0.48	0.10	94.74
	Ileus rate after birth	4.74 ± 0.58	0.12	97.37	4.78 ± 0.56	0.12	97.37	4.74 ± 0.60	0.13	94.74
	Breastfeeding rate	4.68 ± 0.59	0.13	97.37	4.65 ± 0.52	0.11	97.37	4.60 ± 0.65	0.14	94.74
	Incidence of incision infection after caesarean	4.86 ± 0.48	0.10	97.37	4.82 ± 0.40	0.09	97.37	4.76 ± 0.60	0.13	94.74

consequent sensitive indicators mainly included the incidence of bleeding after dangerous placenta previa operation, the incidence of posterior lower limb thrombosis, the incidence of postpartum urinary retention, and the incidence of incision infection after caesarean section. Postoperative bleeding is the main risk of dangerous placenta previa, so the incidence of postoperative bleeding is a very important indicator.

Maternal and neonatal mortality is a major indicator to measure the quality of obstetric, China's maternal mortality rate is 21.7/100 thousand in 2014, decreased 75.6% from 88.8/100 thousand in 1990. The indicator is ultralow, and it is not sensitive to be used as measuring the nursing quality. Therefore, experts suggest that maternal and neonatal mortality is removed from the sensitivity index.

Postpartum haemorrhage is an important factor which causes maternal morbidity and mortality, and it is also dangerous outcome of placenta previa. The caesarean section should be strictly controlled to avoid postpartum haemorrhage. The main factors leading to postpartum haemorrhage are uterine inertia, placental factors, soft birth canal damage, etc., which are closely related to the obstetrical quality.

Experts believe that the following indicators are essential ones, which include incidence of postpartum haemorrhage, incidence of lower limb thrombus, incidence of postpartum urine retention, incidence of postpartum intestinal obstruction, breastfeeding success rate and incision infection after caesarean section rate. All the indicators are above four points in the item importance, calculation formula rationality and operability of data collection. The coefficient of variation was <0.3. The final nursing-sensitive indicators are scientific and applicable, which provide a good clinical guidance to improve the nursing quality for placenta previa.

In addition to the Chinese studies that are referenced, comparisons were discussed thoroughly between the results of this paper and the past relevant international studies from outside China. Our nursing-sensitive indicators for PPP are consistent with those for obstetric department in globe hospitals. Most of nursing-sensitive quality indicators reflect the "structure, process and outcomes" model of nursing care, which was provided by Donabedia (Donabedian, 1988, 1992). In addition, the nursing-sensitive indicators in this paper are more specific and detailed for pernicious placenta previa. So far, no references about nursing-sensitive indicators for PPP were retrieved. So, we can only compare our indicators with those for obstetric nursing and more general nursing (Gao et al., 2018; Heslop & Lu, 2014; Ju et al., 2018; Koch et al., 2020; Mcintyre et al., 2020; Oner et al., 2020).

5.1 | Limitations

This study was conducted in the context of the Chinese healthcare system. The survey was conducted among experts from developed and developing area in China. However, probably it still cannot represent the whole situation of the whole country because of the huge area of China. The views of included Delphi panellists also may differ from those of experts who declined participation. To try to minimize this limitation, a comprehensive search can be conducted among more experts from more hospitals.

6 | CONCLUSIONS

This research successfully developed 38 items of nursing-sensitive indicators for placenta previa based literature retrieval using the modified Delphi method. It can increase the nursing quality, reduce the occurrence of adverse events and improve nursing quality in obstetrics. The indicators are scientific, practical, in line with China's healthcare conditions, which can be used widely in the national hospital. It provides a base for building a national standard of nursing quality sensitive indicators and speed up the construction of nursing informatization and standardization.

CONFLICT OF INTEREST
No conflict of interest has been declared by the authors.

AUTHOR CONTRIBUTIONS
MZ, WC, CL, JS, DW, YW, XM, YW, CY: Contributions to conception and design, or acquisition of data, or analysis and interpretation of data, manuscript drafting or revising it critically for important intellectual content, final approval of the version to be published, and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. Each author: Participation in the work to take public responsibility for appropriate portions of the content.

DATA AVAILABILITY STATEMENT
The authors confirm that the data supporting the findings of this study are available within the article.

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