

Original Article

Application of painless nursing in cesarean delivery parturients due to the failure of natural childbirth via labor analgesia

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Abstract: Objective: To evaluate the application of painless nursing in cesarean delivery parturients due to the failure of natural childbirth via labor analgesia. Methods: A total of 124 parturients who were transferred to cesarean delivery due to the failure of natural childbirth via labor analgesia were selected and randomly divided into two groups. The control group received routine nursing, while the research group was given painless nursing in the operating room, which mainly included interventions in terms of the environment, labor process, and delivery procedure. The visual analog scale (VAS), gestation outcome, stress response, anxiety, sleep quality, and nursing satisfaction were compared between the two groups. Results: Compared with the control group, the sleep quality score was significantly lower in the research group (all $P < 0.001$). Compared with before nursing, the anxiety and VAS scores of the two groups were significantly decreased after nursing ($P < 0.001$). Additionally, the anxiety and VAS scores of the research group after nursing were significantly lower than those of the control group ($P < 0.001$). There was no significant difference for the gestation outcome between the two groups ($P > 0.05$). Compared with before nursing, the levels of malondialdehyde (MDA) and reactive oxygen species (ROS) after nursing were significantly downregulated, while the level of superoxide dismutase (SOD) was significantly upregulated in both groups (all $P < 0.001$). Compared with the control group, the levels of MDA and ROS were significantly lower, while SOD level was significantly higher in the research group after nursing (all $P < 0.001$). Compared with the control group, the nursing satisfaction was significantly higher in the research group ($P < 0.05$). Conclusion: The painless nursing for cesarean delivery parturients in the operating room due to the failure of natural childbirth via labor analgesia can effectively improve the sleep quality and negative moods of the parturients, reduce the degree of pain and stress response in the process of delivery, and result in better satisfaction and compliance.

Keywords: Painless nursing, cesarean delivery, stress response, visual analog score, gestation outcome, nursing satisfaction

Introduction

In natural childbirth, parturients often confront 12 grades of labor pain, which severely affects their physical and mental health. Some of the parturients even have to be transferred to cesarean delivery due to unbearable labor pain [1]. In recent years, epidural labor analgesia has been developed rapidly and is widely applied in the labor analgesia of obstetrics and

gynecology, which can effectively alleviate the pain during childbirth. However, in other scenarios, parturients need to be subject to cesarean section due to dystocia and other factors causing natural delivery failures, which contributes to different degrees of negative impacts on their psychology [2]. Therefore, it is essential to carry out an active nursing intervention for these parturients in clinical practice [3]. Painless nursing is a patient-centered app-

roach, which leverages the preoperative painless technique, intraoperative comfortable and painless nursing, and postoperative recovery nursing and follow-up to ensure that under no pain or less pain condition, nursing is implemented to improve the treatment comfort for patients. Zhao et al. have conducted a painless nursing approach for 160 patients undergoing scheduled surgery so that the patients could be in a better preoperative state, which helps to alleviate patients' fear of surgery and improve the quality of nursing in the operating room [4]. Although labor analgesia has been implemented, some parturients are still required to be transferred to cesarean delivery resulting from the failure of natural childbirth, which will exert a certain pressure on parturients' psychology. Therefore, it is of great importance to apply painless nursing intervention in the operating room. This study focused on the application of painless nursing in cesarean delivery parturients due to the failure of natural childbirth via labor analgesia, aiming to provide an insight into the clinical practice.

Materials and methods

General information

One-hundred and twenty-four parturients who were transferred to cesarean delivery due to the failure of natural childbirth via labor analgesia were recruited in our hospital from January 2017 to May 2018. None of the participants had a history of cesarean section. Inclusion criteria: 1) Complete clinical data and cooperating compliance during the study; termination of painless delivery while transferred to cesarean section; 2) women who did not participate in other clinical studies during this research period; 3) age >18; 4) normal cognitive function to sign the informed consent; 5) parturients with normal coagulation and liver and kidney functions; gestation >37 weeks; pregnancy <6 times; 7) scheduled surgery; 8) with epidural analgesia [5]. Exclusion criteria: 1) Major organ damage; 2) contraindications to anesthesia; 3) non-term pregnancy; 4) immune system diseases; 5) overweight fetuses [6]. The parturients were randomly divided into two groups, the research group (n=62) and the control group (n=62). The study was approved by the Ethics Committee of our hospital, and parturients understood relevant contents of the study and signed informed consent.

Methods

The corresponding nursing was applied to parturients once entering the operating room.

(1) The control group was received routine nursing. Nurses closely observed the delivery process, evaluated the physical condition, developed safe and effective nursing procedures, and observed the maternal and infant conditions during delivery. (2) The research group was given painless nursing in the operating room. 1) Environmental intervention: nurses introduced the environment of the operating room, informed parturients of the delivery position and the method of anesthesia, which helped relieve the depression and fear [7]. Because parturients underwent combined spinal-epidural anesthesia, patients should be transferred to the cesarean section immediately after the failure of natural childbirth via labor analgesia, which increased the parturients' psychological stress and affected the delivery process. Therefore, the process should be guided by experienced nurses to proactively communicate with parturients, give them encouragement, comfort, and care, and accompanied with them all the time, which was beneficial to the relief of negative emotions. 2) Dynamic observation of the maternal delivery process: nurses should understand the clinical data of parturients, proactively encourage them, and engage the communication, which was helpful to objectively assess the mental state of parturients [8]. Parturients were introduced to cases of successful childbirth, which helped to improve their confidence and compliance and reduce the childbirth pain to a certain extent. Playing quiet and peaceful music can distract parturients' attention and reduce their psychological distress. 3) Introduction of the childbirth process: currently, some parturients were not very aware of the knowledge regarding painlessness in the operating room and the principle of anesthesia. Nurses should explain the principle of anesthesia to the parturients and inform them that anesthetics would not harm the fetus, while at the same time, it can regulate the level of catecholamines of parturients and benefit the fetuses and their mothers. In addition, nurses should confidently analyze the data regarding maternal comorbidities and medical history and introduce the ward environment to parturients, which was conducive to eliminating the sense of helplessness and strangeness

in order to relieve the pain. 4) Care intervention: nurses assisted the parturients to choose a suitable position, used blankets to cover the private parts, and applied care intervention to improve their cooperation [9]. 5) Intervention of post-childbirth: after the childbirth was done, nurses should inform parturients of the newborn status, while parturients should appropriately comfort the fetuses to maintain a stable mood. Secondly, nurses should control the amount of bleeding and ameliorate the anxiety and distress.

Outcome measurements

(1) Comparison of general information between the two groups. The general information such as age, gestational weeks, pregnancy times, parity, anesthesia method, operation time, and intraoperative blood loss was compared between the two groups. (2) Comparison of sleep quality between the two groups. The quality of sleep (QS) scale was applied to evaluate the sleep quality of the parturients, which mainly included daytime function, subjective sleep quality, hypnotic time, sleep obstacle, time to fall asleep, sleep efficiency, sleep time, etc. At the end of the cesarean section, parturients' sleep quality on the same day was evaluated. The lower the score, the better the sleep quality. (3) Comparison of anxiety and VAS between the two groups. The VAS was used to evaluate maternal anxiety before and after nursing [10]. The scale was grouped into 3 levels, including 72-100 points: severe anxiety; 63-72 points: moderate anxiety; 53-62 points: mild anxiety. The higher the score, the higher the anxiety. When the delivery was done, expected mothers' physical strength was recovered, and vital signs such as breathing, heart rate, and blood pressure were stable, the pain of parturients were evaluated using VAS, which was divided into 4 categories, 7-10 points: severe headache; 4-6 points: moderate headache; 1-3 points: mild headache; 0 points: no pain. The total score was 10 points, the lower the score, the better the recovery of the maternal condition [11]. (4) Comparison of the gestation outcome between the two groups. After delivery, the number of normal newborns, low birth weight infants, fetal malformations, and stillbirths were quantified, and the incidence was calculated. (5) Comparison of oxidative stress reaction between the two groups. A fasting

venous blood (3 mL) was collected from the two groups of parturients before and after nursing, followed by a centrifugation at 3500 rpm. Indicators such as ROS, SOD, and MDA were measured according to the manufacturer's protocol. The higher the positive values, the better the intervention [12]. The kit was provided by Shanghai Yansheng Biochemical Reagent Co., Ltd. The normal ranges of SOD, MDA, and ROS were 180-235 U/mL, 1530-850 nmol/mL, and 2-4 U/L, respectively [13]. (6) Comparison of satisfaction, including dissatisfied, satisfied, and strongly satisfied between the two groups. After delivery, the number of corresponding parturients was counted and the incidence was calculated. Satisfaction = (strongly satisfied + satisfied)/total number cases *100%. The higher the satisfaction, the better the intervention.

Statistical analysis

The statistical analysis was conducted using SPSS19.0 software. The quantitative data were presented as mean \pm standard deviation ($\bar{x} \pm sd$). The comparison before and after nursing within the same group was analyzed by paired t-test, while the comparison between 2 groups was done by independent sample t-test. The counting data were presented as rate (%) and analyzed by χ^2 (%) test. $P < 0.05$ indicated a statistically significant difference.

Results

Comparison of general information between the two groups

There was no significant difference regarding the general information between the two groups of parturients ($P > 0.05$) (**Table 1**).

Comparison of sleep quality between the two groups

Compared with the control group, the QS scores of the research group were significantly lower (all $P < 0.001$) (**Table 2**).

Comparison of anxiety and VAS between the two groups

Before nursing, there was no significant difference in terms of anxiety and VAS between the two groups ($P > 0.05$). Compared with before

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Table 1. Comparison of general information between the two groups ($\bar{x} \pm sd$)

Group	Research group	Control group	t	P
Case	62	62		
Average age (year)	26.8±1.4	26.6±1.5	0.768	0.444
Average gestational weeks (w)	39.6±1.8	40.1±1.7	1.590	0.114
Average pregnancy times (times)	3.2±0.4	3.3±0.5	1.230	0.221
Average parity (times)	1.8±0.7	1.7±0.6	0.854	0.395
Operation time (min)	39.1±10.1	42.3±9.2	1.844	0.068
Intraoperative blood loss (mL)	462.1±71.2	475.3±78.7	0.979	0.329

Table 2. Comparison of sleep quality between the two groups (score, ($\bar{x} \pm sd$))

Group	Research group	Control group	t	P
Case	62	62		
Daytime function	1.81±0.22	2.34±0.12	16.653	0.000
Subjective sleep quality	2.26±0.34	2.74±0.51	6.166	0.000
Hypnotic time	1.42±0.31	2.49±0.53	13.722	0.000
Sleep obstacle	1.43±0.21	2.21±0.42	13.079	0.000
Time to fall asleep	1.96±0.24	2.54±0.42	9.441	0.000
Sleep efficiency	1.12±0.37	2.23±0.52	13.695	0.000
Sleep time	1.41±0.36	2.34±0.41	13.421	0.000

Table 3. Comparison of anxiety and VAS between the two groups (score, ($\bar{x} \pm sd$))

Group	Control group	Research group	t	P
Case	62	62		
Anxiety				
Before nursing	42.21±2.69	41.73±2.74	0.984	0.327
After nursing	39.32±3.67	35.12±3.31	6.692	0.000
VAS				
Before nursing	7.27±3.21	7.15±3.14	0.210	0.834
After nursing	2.42±1.05	1.31±1.12	5.693	0.000

Note: VAS: visual analog scale.

nursing, the anxiety and VAS of the two groups were significantly decreased after nursing ($P < 0.001$). In addition, the anxiety and VAS of the research group were significantly lower after nursing than those of the control group ($P < 0.001$) (**Table 3** and **Figure 1**).

Comparison of pregnancy outcomes between the two groups

There was no significant difference regarding pregnancy outcomes between the two groups ($P > 0.05$) (**Table 4**).

Comparison of oxidative stress between the two groups

Before nursing, there was no significant difference regarding the levels of MDA, ROS, and SOD between the two groups ($P > 0.05$). Compared with before nursing, the levels of MDA and ROS were significantly downregulated, while the level of SOD was significantly upregulated in both groups after nursing (all $P < 0.001$). Additionally, compared with the control group, the levels of MDA and ROS were significantly lower, while SOD level was significantly higher in the research group after nursing (all $P < 0.001$) (**Table 5** and **Figure 2**).

Comparison of satisfaction between the two groups

Compared with the control group, the nursing satisfaction was significantly higher in the research group ($P < 0.05$) (**Table 6**).

Discussion

It has been reported that more and more women choose cesarean delivery nowadays, mainly due to their low pain tolerance during labor [14]. Additionally, growing number of parturients prefer labor

analgesia to effectively reduce the pain during natural delivery. However, parturients who are not able to give birth via natural delivery still need to be transferred to cesarean section. Therefore, the painless nursing approach in the operating room plays an important role in the process of delivery [15]. Currently, labor analgesia is the major choice for intraoperative analgesia, of which the rationale is to block low back nerves that contribute to the pain when parturients are conscious. This strategy could extensively minimize maternal pain without affecting normal activity [16, 17]. However, once

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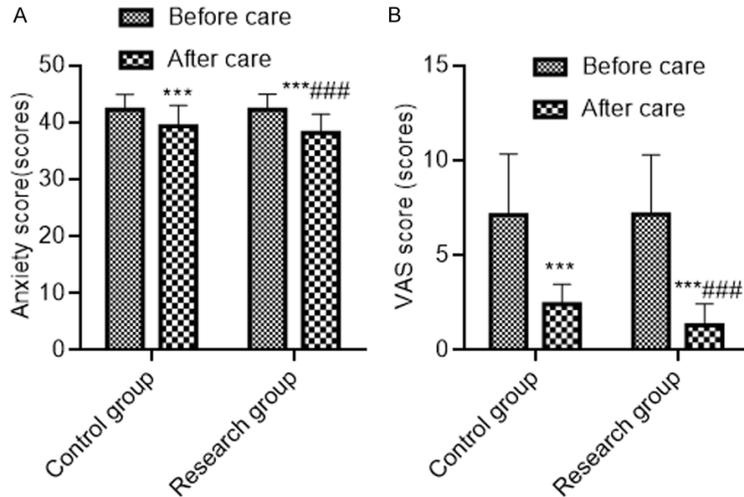


Figure 1. Comparison of anxiety and VAS between the two groups. A: Anxiety score; B: VAS score. Compared with the group before care, *** $P < 0.001$; compared with the control group, ### $P < 0.001$. VAS: visual analog scale.

Table 4. Comparison of pregnancy outcomes between the two groups (case (%))

Group	Control group	Research group	χ^2	P
Case	62	62		
Normal newborns	58 (93.55)	59 (95.16)	0.000	1.000
Low birth weight infants	4 (6.45)	3 (4.84)	0.000	1.000
Fetal malformations	0 (0.00)	0 (0.00)	0.000	1.000
Stillbirths	0 (0.01)	0 (0.00)	0.000	1.000

Table 5. Comparison of oxidative stress reaction between the two groups ($\bar{x} \pm sd$)

Group	Control group	Research group	T	P
Case	62	62		
SOD (U/mL)				
Before nursing	118.61 \pm 22.52	120.36 \pm 22.34	0.434	0.665
After nursing	174.36 \pm 24.42	214.53 \pm 26.18	8.835	0.000
MDA (nmol/mL)				
Before nursing	4057.31 \pm 513.84	4082.38 \pm 479.25	0.281	0.779
After nursing	2395.12 \pm 183.15	1274.54 \pm 104.12	66.219	0.000
ROS (U/L)				
Before nursing	8.47 \pm 2.83	8.44 \pm 2.81	0.059	0.953
After nursing	6.14 \pm 2.02	3.34 \pm 1.52	8.721	0.000

Note: SOD: superoxide dismutase; MDA: malondialdehyde; ROS: reactive oxygen species.

this analgesia fails, combined spinal and epidural anesthesia is still required to ensure a successful cesarean section. At this point, effective and painless nursing for the parturients is important to improve their cooperation

and ensure a successful surgery.

During laboring, when nurses introduce previous cases of successful childbirth to the parturients, it can eliminate their stress, improve their compliance, and ensure smooth progress of the delivery [18]. This study investigates the application of painless nursing in the operating room in cesarean delivery parturients due to the failure of natural childbirth via labor analgesia and the impact on maternal satisfaction and compliance. We have demonstrated that the research group shows higher satisfaction and compliance compared with the control group. Our data also showed that compared with routine nursing, the painless nursing approach in the operating room can significantly increase parturients' satisfaction and compliance to a greater extent as well as more ideal clinical effects. Childbirth is often accompanied by obvious stress responses. This study applies the intervention via painless nursing in the operating room, leading to more ideal and satisfactory outcome [19, 20]. The results revealed that compared with the control group, the levels of stress response indicators are significantly lower in the research group. Thus, our data suggest that during cesarean delivery, painless nursing in the operating room plays an important role in reducing maternal stress responses, maintaining the stability of various vital signs, and improve the safety

of delivery [21]. Before delivery, nurses proactively communicate with parturients for prenatal education, which can improve their knowledge in terms of childbirth, relieve their negative mood, and ultimately improve the pregnan-

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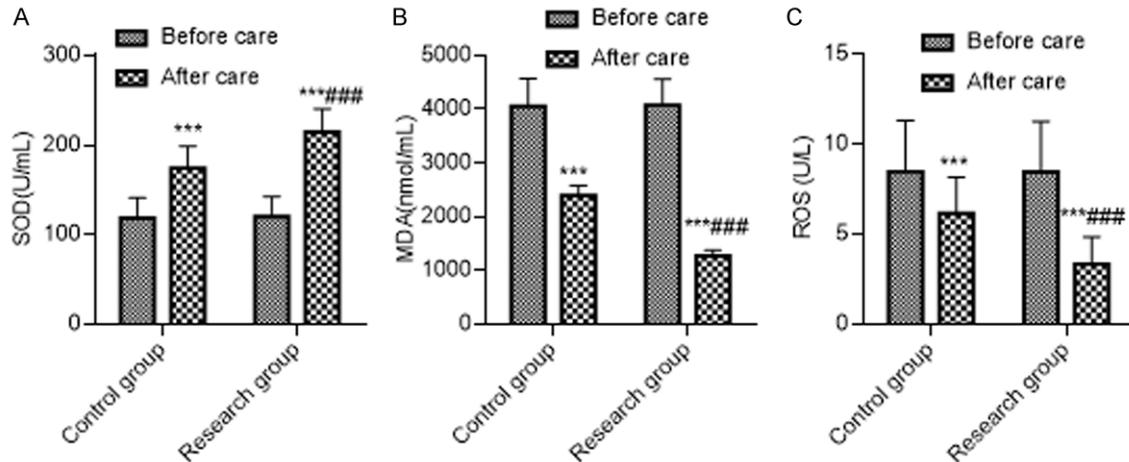


Figure 2. Comparison of oxidative stress response between the two groups. A: SOD; B: MDA; C: ROS. Compared with the group before care, *** $P < 0.001$; compared with the control group, ### $P < 0.001$. SOD: superoxide dismutase; MDA: malondialdehyde; ROS: reactive oxygen species.

Table 6. Comparison of satisfaction between the two groups (case (%))

Group	Control group	Research group	χ^2	P
Case	62	62		
Dissatisfied	8 (12.90)	2 (3.23)	3.921	0.141
Satisfied	12 (19.35)	13 (20.97)		
Strongly satisfied	42 (67.74)	47 (75.81)		
Satisfaction	87.10%	96.77%	3.916	0.048

cy outcomes [22, 23]. we have also demonstrated that compared with the control group, the anxiety and VAS scores of the research group are significantly lower. In addition, compared with routine nursing, a painless nursing method in the operating room is more effective in the improvement of negative emotions of the parturients and the reduction of the pain degrees, which has revealed a high feasibility and should be propagated and applied in clinical practice [24]. It has been reported that most parturients have sleep disorders after childbirth, which affects their quality of life [25, 26]. Nurses in this study give a high degree of care to the parturients after childbirth and answer their questions to make them feel more care, which helps eliminate their sleep disorders [27, 28]. The data of our research demonstrate that compared with the control group, the research group has lower QS scores, indicating a better sleep quality. Our results also show that compared with routine nursing, painless nursing intervention in the operating room

can prolong sleep interval to a greater extent and ensure a good sleep efficiency. It's been also shown that most parturients have significantly upregulated levels of oxidative stress indicators during delivery [29]. This study shows that compared with the control group, the levels of MDA and ROS are significantly downregulated while SOD level is notably upregulated in the research group, which suggests that the application of painless nursing in the operating room can effectively reduce the oxidative stress level of cesarean delivery parturients due to the failure of natural childbirth via labor analgesia.

Our study has excluded women with major organ damage, contraindications to anesthesia, and non-term pregnant women, while has included participants who are in line with our inclusion criteria. Therefore, the clinical data are comparable. This study has explored the nursing effect of two approaches, routine nursing and operating room painless nursing, which is more comparable, in favor of the exploration of nursing effect, and can provide more informative insights for clinical nursing. Nevertheless, this study has some caveats. For example, the number of study samples is small, the research period is short, and the satisfaction evaluation is done via a self-rating scale, because of which the conclusion may be biased and the accuracy is compromised. Therefore, further researches with more samples should be conducted to improve the accuracy of the

data, provide patients with better care approaches, improve the quality of life, and alleviate negative moods.

In summary, the application of painless nursing in cesarean delivery parturients due to the failure of natural childbirth via labor analgesia can effectively improve the sleep quality and negative moods of the parturients, reduce the degree of pain and stress response, and contribute to a high satisfaction and compliance. Therefore, in the clinical nursing of cesarean delivery parturients, this painless nursing strategy in the operating room is worthy of wide propagation and clinical application.

Disclosure of conflict of interest

None.

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References

- [1] Sun W, Li M, Lin T, Sun Z, Zhuang Z, Wen J, Ji S, Xie Y, Lu J, Luo C, Wu W, Wang L, Zheng L and Xu D. Effectiveness of acupuncture for recovery of flatulence after cesarean section: a case report. *Medicine (Baltimore)* 2018; 97: e13352.
- [2] Litwack K and Brower AM. The university of wisconsin-milwaukee flexible option for bachelor of science in nursing degree completion. *Acad Med* 2018; 93: S37-S41.
- [3] Cho A, So J, Ko EY and Choi D. Spinal anesthesia for cesarean section in a super morbidly obese parturient: a case report. *Medicine (Baltimore)* 2020; 99: e21435.
- [4] Zhao LJ, Yu XF and Li XY. Effect of painless nursing technology on nursing quality in operating room. *Int J Nurs* 2014; 5: 1107-1109.
- [5] Gathara D, Serem G, Murphy GAV, Obengo A, Tallam E, Jackson D, Brownie S and English M. Missed nursing care in newborn units: a cross-sectional direct observational study. *BMJ Qual Saf* 2020; 29: 19-30.
- [6] Honeyball F. Safety of delivering chemotherapy by community nursing staff supervised by telemedicine in remote New South Wales (NSW). *J Clin Oncol* 2018; 36: 82.
- [7] Liu YT, Lin X, Lin SJ, Chen YC and Chen XL. Effect of painless nursing intervention in operating room on improving intraoperative comfort of patients undergoing non general anesthesia surgery. *Chin J Mod Drug Appl* 2018; 12: 181-182.
- [8] Wu SW, Dian H and Zhang WY. Labor onset, oxytocin use, and epidural anesthesia for vaginal birth after cesarean section and associated effects on maternal and neonatal outcomes in a tertiary hospital in china: a retrospective study. *Chin Med J (Engl)* 2018; 131: 933-938.
- [9] Shin DW, Kim Y, Hong B, Yoon SH, Lim CS and Youn S. Effect of fentanyl on nausea and vomiting in cesarean section under spinal anesthesia: a randomized controlled study. *J Int Med Res* 2019; 47: 4798-4807.
- [10] Tao M and Gao JF. Reliability and validity of revised self rating Anxiety Scale (SAS-CR). *Chin J Nervous Mental Dis* 1994; 5: 301-303.
- [11] Zhang Q, Kan HL, Wang DX and Fu DM. Neonatal effect of remifentanyl in cesarean section with general anesthesia: a protocol of systematic review and meta-analysis. *Medicine (Baltimore)* 2020; 99: e20212.
- [12] Treichel NS, Prevoršek Z, Mrak V, Kostrić M, Vestergaard G, Foessel B, Pfeiffer S, Stres B, Schöler A and Schlöter M. Effect of the nursing mother on the gut microbiome of the offspring during early mouse development. *Microb Ecol* 2019; 78: 517-527.
- [13] Li J and Geng Y. Determination and significance of MDA and SOD in serum of patients with pregnancy induced hypertension. *Matern Child Health Care China* 1996; 11: 55-56.
- [14] Yang Q, Ren M, Lv X and Chen F. Association of menstrual extension and surgery effectiveness with ultrasound parameters of cesarean section scar diverticulum in patients undergoing transvaginal uterine diverticulum repair. *Mediators Inflamm* 2019; 2019: 7415891.
- [15] Wang CH, Kuo NW and Anthony K. Impact of window views on recovery-an example of post-cesarean section women. *Int J Qual Health Care* 2019; 31: 798-803.
- [16] Bernstein SN, Cudemus-Deseda GA, Ortiz VE, Goodman A and Jassar AS. Case 33-2019: a 35-year-old woman with cardiopulmonary arrest during cesarean section. *N Engl J Med* 2019; 381: 1664-1673.
- [17] Sloane DM, Smith HL, McHugh MD and Aiken LH. Effect of changes in hospital nursing resources on improvements in patient safety and quality of care: a panel study. *Med Care* 2018; 56: 1001-1008.
- [18] Martinsson J and Gustafsson S. Modeling the effects of telephone nursing on healthcare utilization. *Int J Med Inform* 2018; 113: 98-105.
- [19] Illmann G, Goumon S, Šimečková M and Leszkowová I. Effect of crate opening from day 3 postpartum to weaning on nursing and suckling behaviour in domestic pigs. *Animal* 2019; 13: 2018-2024.

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- [20] Gill TM, Han L, Gahbauer EA, Leo-Summers L and Allore HG. Prognostic effect of changes in physical function over prior year on subsequent mortality and long-term nursing home admission. *J Am Geriatr Soc* 2018; 66: 1587-1591.
- [21] Trepanier MO, Wassef M and Beauchamp S. OP40 effect of advanced nursing practice on hospital use for the elderly. *Inter J Technol Assess Health Care* 2018; 34: 15-16.
- [22] Ling F. Application effect analysis of evidence-based nursing on radiotherapy of malignant tumour patients. *Monthly Notices Royal Astron Soci* 2018; 412: 2303-2317.
- [23] Joyce C, Schneider M, Stevans JM and Benecuk JM. Improving physical therapy pain care, quality, and cost through effectiveness-implementation research. *Phys Ther* 2018; 98: 447-456.
- [24] Grant AD, Miller MM, Hollingshead NA, Anastas TM and Hirsh AT. Intergroup anxiety in pain care: impact on treatment recommendations made by white providers for black patients. *Pain* 2020; 161: 1264-1269.
- [25] Beck SL, Dunton N, Berry PH, Brant JM, Guo JW, Potter C, Spornitz B, Eaton J and Wong B. Dissemination and implementation of patient-centered indicators of pain care quality and outcomes. *Med Care* 2019; 57: 159-166.
- [26] Ashrafioun L, Zerbo KRA, Bishop TM and Britton PC. Opioid use disorders, psychiatric comorbidities, and risk for suicide attempts among veterans seeking pain care. *Psychol Med* 2020; 50: 2107-2112.
- [27] Den Hollander M, Heijnders N, De Jong JR, Vlaeyen JWS, Smeets R and Goossens M. Exposure in vivo versus pain-contingent physical therapy in complex regional pain syndrome type I: a cost-effectiveness analysis. *Int J Technol Assess Health Care* 2018; 34: 400-409.
- [28] Dale CM, Prendergast V, Gélinas C and Rose L. Validation of The Critical-care Pain Observation Tool (CPOT) for the detection of oral-pharyngeal pain in critically ill adults. *J Crit Care* 2018; 48: 334-338.
- [29] Liu BB. Effect of carboprost tromethamine combined with oxytocin on postpartum hemorrhage, coagulation function and oxidative stress index in cesarean section. *Matern Child Health Care China* 2020; 35: 62-65.