Original Article
Bedside nursing intervention improves hemostatic efficiency and reduces postpartum depression in postpartum hemorrhage patients

Qian Yang, Hui Luo, Jianhua Yang

School of Nursing, Chengdu Medical College, Chengdu 610083, Sichuan, China

Abstract: Objective: Bedside nursing intervention (BNI) can improve hemostatic efficiency and reduce postpartum depression (PPD) in postpartum hemorrhage (PPH) patients. Methods: Altogether 183 patients with PPH treated at the First Affiliated Hospital of Chengdu Medical College were enrolled as the study cohort and divided into a study group (n=97, treated with BNI) and a control group (n=86, treated with conventional nursing) according to the nursing method each patient received. Their bleeding volumes at 2 and 24 hours after delivery, their hemostasis times, sign recovery times, hospital stays, and complications were recorded. The changes in their coagulation factor levels were observed before and after the nursing. The Self-Rating Anxiety Scale (SAS), the Self-Rating Depression Scale (SDS), and the Pittsburgh Sleep Quality Index (PSQI) were used to evaluate their mental health, sleep quality, and self-care abilities. The adult form of the Generic Quality of Life Inventory-74 (GQOL-74) was used to evaluate their quality of life (QOL). The self-made *nursing satisfaction questionnaire* of the First Affiliated Hospital of Chengdu Medical College was used to evaluate their nursing satisfaction. Results: The postpartum bleeding volumes, hemostasis times, sign recovery times, and hospital stays were better in the study group than they were in the control group. After the nursing, compared with the patients in the control group, the patients in the study group had lower SAS and SDS scores, lower PSQI scores, better coagulation factor levels, higher ESCA scores, a lower incidence of complications, higher GQOL-74 scores, and higher nursing satisfaction. Conclusion: BNI for patients with PPH can improve their coagulation factor levels, reduce their postpartum bleeding volumes and complications, and improve their sleep quality, nursing satisfaction, and QOL.

Keywords: Bedside nursing, PPH, hemostatic efficiency, PPD

Introduction

A major cause of maternal deaths around the world [1], postpartum hemorrhage (PPH) is usually caused by uterine inertia, coagulation disorders, colporrhexis, and placental retention during delivery [2]. PPH increases the risks of anemia, hypotension, fatigue, blood transfusion, and hemorrhagic shock [3]. Studies have shown that the risk of hemorrhage after cesarean delivery is greater than that after vaginal delivery [4]. Perinatal nursing, including nursing during delivery, reduces the risks after delivery and postpartum complications [5].

With the development of society, the requirements and expectations of parturients and their families on delivery and postpartum nursing are increasing [6]. However, conventional nursing cannot meet the needs and expectations of most of them, because the nursing often involves poor information transmission and nursing quality [7]. Therefore, it is suggested that this intervention mode with poor nursing quality should be improved [8]. Bedside nursing is a special way of providing targeted nursing for parturients, a nursing model that involves staffing with multidisciplinary medical personnel [9]. This mode mainly includes providing psychological and physiological guidance during the pregnancy and puerperal periods. The nursing staff invite family members to participate, strengthen communication among them and the parturients, and to provide one-on-one care for the parturients [10]. According to previous studies, improvements in the quali-

ty of nursing services reduces maternal and perinatal mortality [11]. Bedside nursing also provides targeted solutions to abnormal situations during delivery and targeted nursing guidance to parturients based on different causes of PPH. It combines the characteristics of each element to improve nursing works, so as to make the nursing more streamlined, organized, and systematic [12, 13]. In a study by Geleto et al., parturients who do not receive obstetric care interventions have an increased risk of complications during delivery, and timely obstetric care when facing complications can make delivery and pregnancy safer and reduce maternal deaths [14].

In this study, the application value of bedside nursing intervention (BNI) for patients with PPH was analyzed in order to provide a feasible intervention measure for the patients during delivery.

Materials and methods

General information

A total of 183 patients with PPH treated at the First Affiliated Hospital of Chengdu Medical College were enrolled. Ninety-seven patients treated with BNI were in the study group, aged 20-36 years, with an average age of (24.52±3.15) years and an average gestational week of (38.22±1.38) weeks. Eighty-six patients treated with conventional nursing were in the control group, aged 19-35 years, with an average age of (24.63±3.05) years and an average gestational week of (38.32±1.28) weeks. This study was approved by the Ethics Committee of the First Affiliated Hospital of Chengdu Medical College. The subjects and their families were informed and signed the informed consent form. The inclusion criteria were as follows: patients who met the diagnostic criteria for PPH [15]; patients who had a single birth; patients with a bleeding volume between 500 mL and 2300 mL after delivery; patients with normal amniotic fluid; patients with complete clinical general data. The exclusion criteria were as follows: patients with fetal macrosomia found in a prenatal examination; patients with mental disorders; patients accompanied by pregnancy-induced hypertension, heart disease, or diabetes; patients with coagulation disorders; patients who midway withdrew from

this experiment; patients with poor treatment compliance; patients lost to follow up.

Nursing methods

The patients in the control group were conventionally nursed. After admission, a prenatal examination was arranged to determine the patients' conditions and guide their diets. The nursing staff encouraged them during the delivery, observed their vital signs after the delivery, such as blood pressure and body temperature, and they provided quiet and clean wards for them. The staff also regularly inspected the wards to prevent postpartum massive hemorrhage and other adverse events.

The patients in the study group were treated with BNI. 1. Health education and psychological guidance: the nursing staff gave guidance on the delivery, self-monitoring, and other knowledge according to the patients' cultural levels and personalities. The staff also comforted them, gave them psychological support, and guided and required their families to communicate with them more, so as to care for and take care of them. In addition, the staff encouraged them, played light music or chatted with them to divert their attention, and kept them happy and optimistic during the treatment, so that they could cooperate with the treatment and nursing after delivery. 2. Postpartum nursing: (1) Uterine nursing: the nursing staff made regular rounds and increased the number of rounds, and they helped the patients massage their uterus immediately if there was PPH. Regular and rhythmic massage could stimulate the uterus, accelerate the elimination of intrauterine hemorrhage, and help strengthen the uterine contractions, so as to lower the possibility of PPH. (2) Vaginal nursing: the delivery caused weakness, and the vagina was prone to bacterial growth. Therefore, the nursing staff quickly cleaned up the blood in the external genitals and placed an indwelling catheter in strict accordance with the aseptic operations, thus avoiding cross infection. (3) Exercise guidance: the nursing staff invited the patients' families to participate in their physical recoveries, kept them in bed when they were bleeding, and strictly prohibited them from getting out of bed, and informed their families that the patients should keep their body in a stable state. After their conditions stabilized, the nurs-

ing staff guided them in getting out of bed for light activities, but the movement range should not be so large in order to avoid secondary bleeding. (4) Sleep guidance and intervention: the nursing staff educated the patients on sleep-related knowledge, such as stretching their limbs to relax their muscles and moods, so as to enter a comfortable sleep state. (5) Parenting guidance: the nursing staff guided the patients to correct their nursing posture, and encouraged their interaction with newborns to enhance their feelings.

Outcome measures

The bleeding volume at 2 hours and 24 hours after delivery, the hemostasis time after nursing, the sign recovery time after delivery, and length of the hospital stay were recorded.

The Self-Rating Anxiety Scale (SAS) and the Self-Rating Depression Scale (SDS) were respectively used to assess the patients' mental health. The SAS scale has a total possible score of 100 points. After the nursing, a score of 50-70 points indicates mild anxiety, a score of 71-90 points indicates moderate anxiety, a score of >90 points indicates severe anxiety. The higher the score, the more severe the postpartum anxiety. The SDS scale has a total possible score of 100 points. After the nursing, a score of 50-70 points indicates mild depression, a score of 71-90 points indicates moderate depression, a score of >90 points indicates severe depression. A high score indicates severe depression.

The Pittsburgh Sleep Quality Index (PSQI) was used to assess the patients' sleep quality before and after the nursing. The scale consists of 5 other evaluations and 19 self-evaluations, for a total score of 21 points. A high score indicates low sleep quality after delivery.

The Exercise of Self-Care Agency Scale (ESCA) has 43 items in 4 different fields, for a total score of 172 points. The total score after the self-evaluation is positively correlated with each patient's self-care abilities.

Venous blood (5 mL) was drawn from the patients before and after the nursing, and the coagulation factors (PT, APTT, FIB, PLT) were measured using a coagulation analyzer HF-6000 (Hunan Hukang Centrifuge Co., Ltd., Item no. HF-6000).

Any adverse events occurring in the patients during the nursing were recorded.

The Generic Quality of Life Inventory-74 (GQOL-74) has 4 dimensions, with a total possible score of 100 points for each dimension. The higher the score after the evaluation, the better the quality of life (QOL) is.

The self-made *nursing satisfaction questionnaire* of the First Affiliated Hospital of Chengdu Medical College was used for the scoring, with 20 questions in total. The patients were scored according to their nursing satisfaction, with 5 points for each question. A total score of <70 points indicates dissatisfied, a total score of 70-89 points indicates satisfied, a total score of ≥90 points indicates very satisfied. Nursing satisfaction = (very satisfied + satisfied cases)/ total number of cases × 100%.

Statistical methods

SPSS 20.0 (IBM Corp, Armonk, NY, USA) was used to statistically analyze the data. GraphPad Prism 7 was used to plot the figures. The count data were expressed as [n (%)], and the comparisons between groups were analyzed using chi-squared tests. When the theoretical frequency in the chi-squared test was less than 5, the comparisons were analyzed using chi-squared tests with corrections for continuity. The measurement data were expressed as the means ± standard deviation (x±sd), and the comparisons between groups were analyzed using independent samples t-tests, and the comparisons within groups before and after the nursing were analyzed using paired t-tests. $P < 0.05$ indicated a statistically significant difference.

Results

General information

There were no significant differences between the study and control groups in terms of the general baseline data such as age, average gestational week, causes of hemorrhage, body mass index (BMI), place of residence, nationality, educational history, history of smoking, history of drinking, food preference, history of hypertension, or mode of delivery (P>0.05). See **Table 1**.

Table 1. Comparison of the general information [n (%)] (x±sd)

Categories	Study group (n=97)	Control group (n=86)	t/χ^2 value	P value
Age (Years)	24.52±3.15	24.63±3.05	0.239	0.811
Average gestational week	38.22±1.38	38.32±1.28	0.506	0.613
Causes of hemorrhage			0.807	0.668
Uterine inertia	41 (42.27)	38 (44.19)		
Placental factors	35 (36.08)	26 (30.23)		
Soft birth canal laceration	21 (21.65)	22 (25.58)		
BMI (kg/m^2)	24.8±2.6	25.4±3.4	1.349	0.179
Place of residence			0.176	0.675
City	50 (51.55)	47 (54.65)		
Countryside	47 (48.45)	39 (45.35)		
Nationality			2.576	0.109
Han	53 (54.64)	57 (66.28)		
Ethnic minorities	44 (45.36)	29 (33.72)		
Educational history			0.022	0.881
≥ Senior high school	61 (62.89)	55 (63.95)		
< Senior high school	36 (37.11)	31 (36.05)		
History of smoking			0.511	0.475
Yes	21 (21.65)	15 (17.44)		
No	76 (78.35)	71 (82.56)		
History of drinking			3.043	0.081
Yes	35 (36.08)	42 (48.84)		
No	62 (63.92)	44 (51.16)		
Food preference			2.461	0.117
Bland	53 (54.64)	37 (43.02)		
Spicy	44 (45.36)	49 (56.98)		
History of hypertension			1.816	0.178
Yes	26 (26.80)	31 (36.05)		
No	71 (73.20)	55 (63.95)		
Mode of delivery			0.458	0.499
Cesarean	42 (43.30)	33 (38.37)		
Eutocia	55 (56.70)	53 (61.63)		

Improvement of the clinical symptoms

An improvement in the clinical symptoms was observed, and the results showed that the postpartum bleeding volume, the hemostasis time, the sign recovery time, and the hospital stay were significantly less in the study group than they were in the control group (P<0.05). See **Table 2**.

SAS and SDS scores

There were no differences in the SAS and SDS scores in the study and control groups before the nursing (P>0.05), but the scores were significantly lower in the study group than they were in the control group after the nursing (P<0.05). See **Figure 1**.

PSQI scores

There was no significant difference in PSQI scores in the study and control groups before the nursing (P>0.05), but the scores were significantly lower in the study group than they were in the control group after the nursing (P<0.05). See **Figure 2**.

ESCA scores after the nursing

There was no significant difference in ESCA score between the study and control groups before nursing (P>0.05), while the score was significantly higher in the study group than that in the control group after nursing (P< 0.05). See **Table 3**.

Coagulation factor levels

There were no differences in the coagulation factor levels in the study and control groups before the nursing (P>0.05). After the nursing, the FIB and PLT levels were significantly higher in the study group than those in the control group (P<0.05), but the PT and ATPP levels were significantly lower than they were in the control group (P<0.05). See **Table 4**.

Complications

Patients in both the study and control groups experienced complications during the nursing. The total incidence of complications in the study group (6.19%) was significantly lower than it was in the control group (17.44%) (P<0.05). See **Table 5**.

*GQOL-74 score*

There was a difference in the GQOL-74 scores between the study and control groups before the nursing (P<0.05). The scores were significantly higher in the study group than they were

Table 2. Improvement of the clinical symptoms (x±sd)

Groups	Number of cases	Bleeding volume (mL)		Hemostasis time (min)	Sign recovery time (d)	Hospital stay (d)
		2 hours after delivery	24 hours after delivery			
Study group	97	152.67±20.31	169.52±20.21	37.25±3.91	2.25±1.1	5.28±1.46
Control group	86	196.57±20.88	243.53±25.32	56.46±4.07	4.36±2.3	7.67±1.76
t	-	14.400	21.950	32.540	8.057	10.040
P	-	<0.001	<0.001	<0.001	<0.001	<0.001
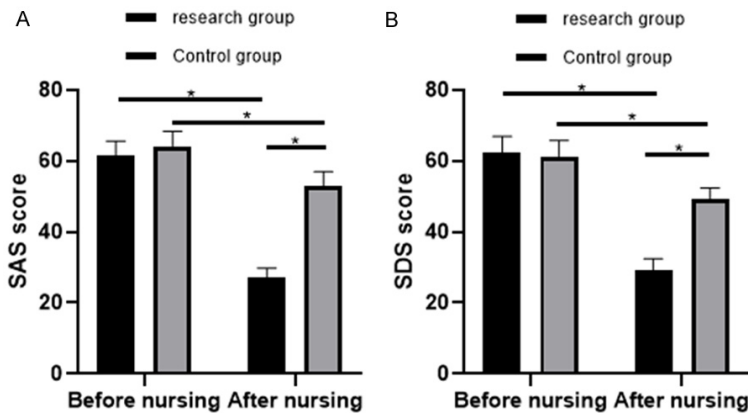
Figure 1. SAS and SDS scores. A: The SAS scores were significantly lower in the study group than they were in the control group after the nursing. B: The SDS scores were significantly lower in the study group than they were in the control group after the nursing. Note: * indicates P<0.05.
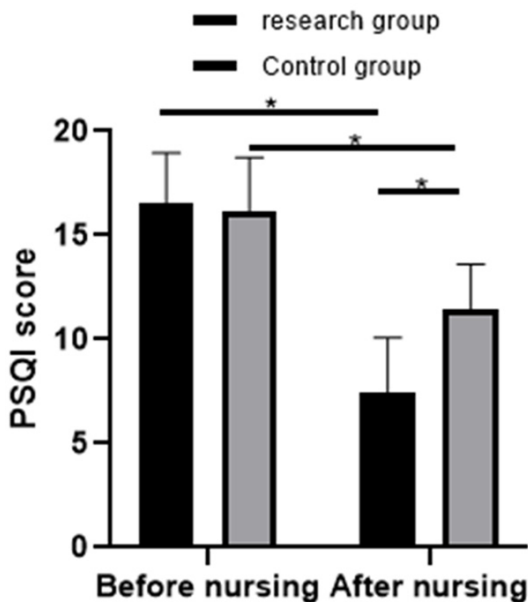
Figure 2. Comparison of the PSQI scores. The PSQI scores were significantly lower in the study group than they were in the control group after the nursing. Note: * indicates P<0.05.

in the control group after the nursing (P<0.05). See **Table 6**.

Nursing satisfaction

The nursing satisfaction was higher in the study group (94.85%) than it was in the control group (81.40%) (P< 0.05). See **Table 7**.

Discussion

Nearly 15% of parturients worldwide face at least one fatal perinatal complication every year [16]. The incidence of PPH has been increasing yearly, and understanding the risk relationship between delivery volume and PPH can prevent the disease and reduce the maternal risk [17]. A study has shown that obstetrical care during delivery reduces the mortality of parturients [18].

In this study, BNI was performed for patients with PPH. Previous studies have revealed that postpartum nursing for pregnant and lying-in women reduces the risk signs of the patients and newborns [19]. For example, according to Laliberté and others, providing a multidisciplinary nursing model for pregnant and lying-in women and newborns can improve their health and nursing satisfaction [20]. In a study by Bhat et al., perinatal depression is common for patients after delivery, and cooperative nursing for patients with the disease relieves their depression [21]. According to Youliang et al., careful nursing before and after delivery can reduce parturients' pain rates, shorten the second stage of delivery, and lower their bleeding volume at 2 hours after delivery. Additionally, it reduces the postpartum infection rate, helps the patients sleep well, and relieves their psychological pressure [22]. In our study, the postpartum bleeding volume, the hemostasis time, the sign recovery time, and the hospital stay were less in the study group than they were in

Table 3. ESCA scores after the nursing (x±sd)

Groups	n	Self-care skills	Self-responsibility	Self-concept	Level of health knowledge
Study group	97	32.76±6.31	16.57±4.33	23.78±6.11	56.75±7.08
Control group	86	22.45±5.21	14.26±4.02	19.67±5.98	46.89±7.01
t	-	11.960	3.725	4.587	9.446
P	-	<0.001	<0.001	<0.001	<0.001

Table 4. Coagulation factor levels (x±sd)

Groups	n	FIB (g/L)		PT (s)		ATPP (s)		PLT (10^9/L)	
		Before nursing	After nursing	Before nursing	After nursing	Before nursing	After nursing	Before nursing	After nursing
Study group	97	1.59±0.9	3.76±0.7	19.27±4.1	12.54±2.7	48.12±9.2	34.21±3.2	62.11±15.2	153.41±39.7
Control group	86	1.67±0.8	2.31±0.8	19.24±3.8	16.13±3.2	47.92±9.1	38.26±4.1	62.32±14.5	107.84±35.3
t	-	0.632	13.080	0.051	8.229	0.148	7.491	0.095	8.160
P	-	0.528	<0.001	0.959	<0.001	0.883	<0.001	0.924	<0.001

Table 5. Complications during nursing [n (%)]

Categories	Study group (n=97)	Control group (n=86)	χ^2 value	P value
Shock	0 (0.00)	2 (2.33)	2.281	0.131
Anemia	2 (2.06)	4 (4.65)	0.964	0.326
Wound infection	1 (1.03)	5 (5.81)	3.289	0.070
Constipation	3 (3.09)	4 (4.65)	0.301	0.583
Total incidence	6 (6.19)	15 (17.44)	5.686	001

Table 6. GQOL-74 scores (x±sd)

Groups	n	Physical function	Psychological function	Social function	Material life
Study group	97	63.27±3.16	45.92±4.32	61.04±4.17	58.69±3.72
Control group	86	51.93±4.73	38.44±5.22	52.83±4.90	52.33±4.07
t	-	19.260	10.600	12.240	11.040
P	-	<0.001	<0.001	<0.001	<0.001

Table 7. Comparison of the nursing satisfaction scores [n (%)]

Groups	n	Very satisfied	Satisfied	Dissatisfied	Satisfaction (%)
Study group	97	66 (68.04)	26 (26.80)	5 (5.15)	92 (94.85)
Control group	86	33 (38.37)	37 (43.20)	16 (18.60)	70 (81.40)
t	-	-	-	-	8.118
P	-	-	-	-	0.004

over, the SAS and SDS scores were lower in the study group than they were in the control group after the nursing, which demonstrates that BNI can enlighten the psychological statuses of the patients and reduce their postpartum depression (PPD). The PSQI scores were also significantly lower in the study group than they were in the control group after the nursing, which indicates that BNI can improve the patients' sleep quality while relieving their psychological pressure. The ESCA scores were significantly higher in the study group than they were in the control group after the nursing, which shows that BNI can improve the patients' self-care abilities and their understanding of newborn nursing.

Coagulation disorders are a common postpartum complication. A study has shown that low levels of coagulation indicators in patients with PPH can lead to sustained hemorrhage due to slow wound healing [23]. In this study, the coagulation factor levels in the study group were significantly better than they were in the control group

the control group, which also confirms the findings of Youliang and others. This suggests that nursing intervention for patients with PPH can reduce their postpartum bleeding volume. In this study, BNI also shortened the patients' hospital stays and sign recovery times. More-

after the nursing, but the incidence of complications was significantly lower than it was in the control group. This indicates that BNI can improve the plasma levels and reduce the incidence of coagulation disorders, thus reducing the postpartum bleeding volume and promoting wound healing rapidly. QOL scores can be used to evaluate parturients' physical recovery after the treatment, and most of them have affected QOL scores after their deliveries [24, 25]. In this study, the GQOL-74 scores was higher in the study group than they were in the control group after the nursing, indicating that BNI can improve the patients' QOL after discharge. Finally, the nursing satisfaction was scored in this study, and the results showed that the nursing satisfaction was higher in the study group than it was in the control group, which showed that the patients had a high regard for this nursing. This provides a powerful reference for subsequent clinical applications.

In summary, BNI for patients with PPH can improve their coagulation factor levels, reduce their postpartum bleeding volumes and complications, and improve their sleep quality, nursing satisfaction, and QOL. However, there is still room for improvement in this study. For example, the causes of PPH could be analyzed to help the nursing staff identify the risk factors requiring additional attention. Therefore, supplementary research will be gradually carried out in the future from the above perspective.

Disclosure of conflict of interest

None.

Address correspondence to: Jianhua Yang, School of Nursing, Chengdu Medical College, No. 601, Tianhui Road, Rongdu Avenue, Jinniu District, Chengdu, Sichuan, China. E-mail: yangzhi8140126@163.com

References

[1] Ononge S, Mirembe F, Wandabwa J and Campbell OM. Incidence and risk factors for postpartum hemorrhage in Uganda. Reprod Health 2016; 13: 38.

[2] Masuzawa Y, Kataoka Y, Fujii K and Inoue S. Prophylactic management of postpartum haemorrhage in the third stage of labour: an overview of systematic reviews. Syst Rev 2018; 7: 156.

[3] Dashtinejad E, Abedi P and Afshari P. Comparison of the effect of breast pump stimulation and oxytocin administration on the length of the third stage of labor, postpartum hemorrhage, and anemia: a randomized controlled trial. BMC Pregnancy Childbirth 2018; 18: 293.

[4] Seligman K, Ramachandran B, Hegde P, Riley ET, El-Sayed YY, Nelson LM and Butwick AJ. Obstetric interventions and maternal morbidity among women who experience severe postpartum hemorrhage during cesarean delivery. Int J Obstet Anesth 2017; 31: 27-36.

[5] Shibata A, Kaneko M and Inoue M. Challenges in providing maternity care in remote areas and islands for primary care physicians in Japan: a qualitative study. BMC Fam Pract 2018; 19: 114.

[6] Perdok H, Jans S, Verhoeven C, Henneman L, Wiegers T, Mol BW, Schellevis F and de Jonge A. Opinions of maternity care professionals and other stakeholders about integration of maternity care: a qualitative study in the Netherlands. BMC Pregnancy Childbirth 2016; 16: 188.

[7] Wesson J, Hamunime N, Viadro C, Carlough M, Katjiuanjo P, McQuide P and Kalimugogo P. Provider and client perspectives on maternity care in Namibia: results from two cross-sectional studies. BMC Pregnancy Childbirth 2018; 18: 363.

[8] Munabi-Babigumira S, Glenton C, Willcox M and Nabudere H. Ugandan health workers' and mothers' views and experiences of the quality of maternity care and the use of informal solutions: a qualitative study. PLoS One 2019; 14: e0213511.

[9] Cheyne H, Elders A, Hill D and Milburn E. Is maternity care in Scotland equitable? Results of a national maternity care survey. BMJ Open 2019; 9: e023282.

[10] James A, Cooper S, Stenhouse E and Endacott R. What factors influence midwives to provide obstetric high dependency care on the delivery suite or request care be escalated away from the obstetric unit? Findings of a focus group study. BMC Pregnancy Childbirth 2019; 19: 331.

[11] Guzha BT, Magwali TL, Mateveke B, Chirehwa M, Nyandoro G and Munjanja SP. Assessment of quality of obstetric care in Zimbabwe using the standard primipara. BMC Pregnancy Childbirth 2018; 18: 205.

[12] Bauer J, Groneberg DA, Maier W, Manek R, Louwen F and Bruggmann D. Accessibility of general and specialized obstetric care providers in Germany and England: an analysis of location and neonatal outcome. Int J Health Geogr 2017; 16: 44.

[13] Portela MC, Lima SML, da Costa Reis LG, Martins M and Aveling EL. Challenges to the improvement of obstetric care in maternity hospi-

tals of a large Brazilian city: an exploratory qualitative approach on contextual issues. BMC Pregnancy Childbirth 2018; 18: 459.

[14] Geleto A, Chojenta C, Musa A and Loxton D. Barriers to access and utilization of emergency obstetric care at health facilities in sub-Saharan Africa: a systematic review of literature. Syst Rev 2018; 7: 183.

[15] Sentilhes L, Vayssiere C, Deneux-Tharaux C, Aya AG, Bayoumeu F, Bonnet MP, Djoudi R, Dolley P, Dreyfus M, Ducroux-Schouwey C, Dupont C, Francois A, Gallot D, Haumonte JB, Huissoud C, Kayem G, Keita H, Langer B, Mignon A, Morel O, Parant O, Pelage JP, Phan E, Rossignol M, Tessier V, Mercier FJ and Goffinet F. Postpartum hemorrhage: guidelines for clinical practice from the French College of Gynaecologists and Obstetricians (CNGOF): in collaboration with the French Society of Anesthesiology and Intensive Care (SFAR). Eur J Obstet Gynecol Reprod Biol 2016; 198: 12-21.

[16] Geleto A, Chojenta C, Mussa A and Loxton D. Barriers to access and utilization of emergency obstetric care at health facilities in sub-Saharan Africa-a systematic review protocol. Syst Rev 2018; 7: 60.

[17] Merriam AA, Wright JD, Siddiq Z, D'Alton ME, Friedman AM, Ananth CV and Bateman BT. Risk for postpartum hemorrhage, transfusion, and hemorrhage-related morbidity at low, moderate, and high volume hospitals. J Matern Fetal Neonatal Med 2018; 31: 1025-1034.

[18] Pallangyo E, Mbekenga C, Olsson P, Eriksson L and Bergstrom A. Implementation of a facilitation intervention to improve postpartum care in a low-resource suburb of Dar es Salaam, Tanzania. Implement Sci 2018; 13: 102.

[19] Izudi J, Akwang GD and Amongin D. Early postnatal care use by postpartum mothers in Mundri East County, South Sudan. BMC Health Serv Res 2017; 17: 442.

[20] Laliberte C, Dunn S, Pound C, Sourial N, Yasseen AS 3rd, Millar D, Rennicks White R, Walker M and Lacaze-Masmonteil T. A randomized controlled trial of innovative postpartum care model for mother-baby dyads. PLoS One 2016; 11: e0148520.

[21] Bhat A, Reed S, Mao J, Vredevoogd M, Russo J, Unger J, Rowles R and Unutzer J. Delivering perinatal depression care in a rural obstetric setting: a mixed methods study of feasibility, acceptability and effectiveness. J Psychosom Obstet Gynaecol 2018; 39: 273-280.

[22] Ou Y, Zhou Y and Xiang P. Effect of obstetric fine nursing on pain during natural childbirth and postpartum recovery. Iran J Public Health 2018; 47: 1703-1708.

[23] Gillissen A, van den Akker T, Caram-Deelder C, Henriquez DDCA, Bloemenkamp KWM, de Maat MPM, van Roosmalen JJM, Zwart JJ, Eikenboom J and van der Bom JG; TeMpOH-1 Study Group. Coagulation parameters during the course of severe postpartum hemorrhage: a nationwide retrospective cohort study. Blood Adv 2018; 2: 2433-2442.

[24] van den Bosch AAS, Goossens M, Bonouvrié K, Winkens B, Nijhuis JG, Roumen FJME and Wassen MMLH. Maternal quality of life in routine labor epidural analgesia versus labor analgesia on request: results of a randomized trial. Qual Life Res 2018; 27: 2027-2033.

[25] Tsai SY, Lee PL, Lin JW and Lee CN. Cross-sectional and longitudinal associations between sleep and health-related quality of life in pregnant women: a prospective observational study. Int J Nurs Stud 2016; 56: 45-53.