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Comparison of labour and postnatal satisfaction between women with and without severe maternal morbidity: a double-cohort study

Adnan Fatin Imtithal, Mohd Noor Norhayati 🔟 , Yunus Nor Akma

Department of Family Medicine, Universiti Sains Malaysia, Kampus Kesihatan, Kubang Kerian, Kelantan, Malaysia

Correspondence to
Mohd Noor Norhayati;
hayatikk@usm.my

ABSTRACT

Objective To compare labour and postnatal satisfaction between women with and without severe maternal morbidity in a tertiary hospital in Kelantan, Malaysia.

Design A prospective double-cohort study.

Setting Hospital and community based.

Participants Women at childbirth and 1-month post partum.

Outcome measures Labour satisfaction measured using the Malay version of the Women's Views of Birth Labour Satisfaction Questionnaire and postnatal satisfaction measured using the Malay version of the Women's Views of Birth Postnatal Satisfaction Questionnaire.

Results A total of 198 participants responded following childbirth, while 193 responded 1-month post partum. Accordingly, although no significant difference in labour satisfaction scores following childbirth was observed between women with and without severe maternal morbidity, a significant difference in postnatal satisfaction score 1-month post partum had been noted (adjusted mean difference [95% CI]: 3 [0.54 to 5.45]; p=0.019). Moreover, domains for nursing a baby (0.08 [0.024] vs 0.06 [0.029]; p=0.022) and professional support (0.03 [0.022] vs 0.03 [0.029]; p=0.023) differed significantly between women with and without severe maternal morbidity.

Conclusions Healthcare professional support and nursing of babies influenced the relationship between satisfaction and severe maternal morbidity during the later postpartum period.

Strengths and limitations of this study

► Used the WHO standard definition and criteria for severe maternal morbidity.
► Employed a prospective double-cohort approach that explored maternal satisfaction during labour and 1-month post partum.
► Focused on the most relevant aspects of maternal satisfaction with care during labour and postnatal periods.
► This was a single hospital-based study; the findings may not reflect the situation of the entire nation.
► Maternal satisfaction was based on perception, which can be easily affected by various pregnancy outcomes.

not sufficiently reduce maternal mortality and severe morbidity. A complex interplay exists between the experience of care and pregnancy outcomes.[2] As such, patient-centred measures, such as maternal satisfaction, should be considered an alternative for improving quality of care.

Studies on maternal satisfaction have aimed to evaluate health service provision by understanding maternal perceptions and expectations, promoting adherence to health services, and improving care quality. Many of these studies have enrolled patients with uncomplicated births.[3–6] Others have focused on a specific group of patients or conditions, such as postcaesarean section,[7] primiparous mothers,[8–10] and unmarried mothers,[11] and the role of pain relief.[12] Another study had assessed factors contributing to maternal satisfaction, including psychosociological conditions, the physiology of women and their relationship with personal caregivers, mainly 4–6 weeks post partum.[13] Although few studies have explored maternal satisfaction during labour and post partum in Malaysia, research

INTRODUCTION

Quality of care can be described as 'the extent to which healthcare services provided to individuals and patient populations improve desired health outcomes, and to achieve this, healthcare must be safe, effective, timely, efficient, equitable and people centred'.[1 2] The term 'people-centred' in the provision of care considers the preferences and aspirations of individual service users and cultures within their communities.[1] Criteria for comprehensively describing the quality of care have been lacking. In contrast, maximising the coverage of essential interventions could

focusing on satisfaction during antenatal care[14 15] and receiving spinal anaesthesia during labour[7] has been available.

As in many low/middle-income countries, Malaysia provides free access to antenatal and postpartum care. Antenatal care follow-up are done in primary care clinics and if further management is required, the women are referred to the tertiary centres. Women with high-risk pregnancies as well as low-risk pregnancies but developed complications deliver in these hospitals under the guidance of obstetricians. Women with low-risk pregnancies and without complications deliver under the guidance of midwives and medical officers in hospitals in their district. Once after delivery and the mother has made her initial recovery, she goes home and is visited by the community nurse. She typically sees her healthcare provider in the health clinic at the 1-month postpartum check-up.

Criteria for comprehensively describing the quality of care have been lacking. In contrast, researchers have shown that maximising the coverage of essential interventions could not sufficiently reduce maternal mortality and severe morbidity. A complex interplay exists between the experience of care and pregnancy outcomes. Patient-centred measures, such as maternal satisfaction, should be considered an alternative for improving the quality of care. To our knowledge, limited research has been available on maternal satisfaction during birth and post partum. Existing studies on maternal satisfaction have been focused on antenatal and postanalgesic satisfaction. The findings obtained herein will determine whether the effects of morbid events affecting labour satisfaction may persist for extended periods, thus affecting postnatal satisfaction. Furthermore, assessing satisfaction among women with severe maternal morbidities would contribute to the body of knowledge in the recent and growing maternal morbidity research.

This study aimed to compare (1) labour satisfaction scores between women with and without severe maternal morbidity following childbirth and (2) postnatal satisfaction scores between women with and without severe maternal morbidity 1-month post partum. We hypothesised that women with severe maternal morbidity would perceive lower labour and postnatal satisfaction than those without severe maternal morbidity due to the morbidities affecting their physical and mental health. It is because satisfaction is a value-based judgement affecting the degree of congruence between perceived and expected services.[16] Labour satisfaction refers to the satisfaction of women after giving birth (ie, prior to hospital discharge) assessed using the Women's Views of Birth Labour Satisfaction Questionnaire (WOMBLSQ). In contrast, postnatal satisfaction refers to the satisfaction of women at 1-month post partum assessed using the Women's Views of Birth Postnatal Satisfaction Questionnaire (WOMBPNSQ).

METHODS

This prospective double-cohort study was conducted between January and December 2018. The exposure factor in this study was the occurrence of severe maternal morbidity. Two cohorts of postpartum women (ie, those with and without severe maternal morbidity) were compared at childbirth and followed at 1-month post partum to determine outcomes.

This study was conducted in Kelantan. It is a state in the northeast of Peninsular Malaysia with approximately 1.7 million population. The reference population included all postpartum women at the Raja Perempuan Zainab II Hospital, Kelantan. It is the state hospital and accounts for 37.8% of total deliveries in Kelantan. Within the study period, the source population comprised postpartum women admitted to the Raja Perempuan Zainab II Hospital, Kelantan. The exposed and non-exposed group comprised of women with and without severe morbidity, respectively. The inclusion criteria for the exposed group were the presence of severe maternal morbidity,[17 18] age ≥18 years and the ability to speak and understand the Malay language. The inclusion criteria for the non-exposed group were age ≥18 years and ability to speak and understand the Malay language. Women who delivered at other birth centres, had a history of diagnosed psychiatric disorder and were non-Malaysian citizens were excluded.

Severe maternal morbidity is defined as a potentially life-threatening condition during pregnancy and childbirth or after the termination of pregnancy from which maternal near-miss cases would emerge.[17 18] This was based on criteria requiring at least one of the following conditions to be present: haemorrhage (abruptio placentae, placenta accreta/increta/percreta, ectopic pregnancy, postpartum haemorrhage and ruptured uterus), hypertension (severe pre-eclampsia, eclampsia, severe hypertension, hypertensive encephalopathy and the syndrome of hemolysis, elevated liver enzymes and low platelets [HELLP syndrome]), other systemic disorders (endometritis, pulmonary oedema, respiratory failure, seizures, sepsis, shock, thrombocytopenia and thyroid crisis) and severe management indicators (blood transfusion, central venous access, hysterectomy, intensive care unit admission, a prolonged hospital stay of more than seven postpartum days, intubation not related to the anaesthetic procedure, return to the operating room and laparotomy excluding caesarean section).

Sample size calculation to determine the number of women needed to detect a significant difference in postnatal satisfaction was conducted by comparing two means using the Power and Sample Size Calculation software, V.3.0.43 (Microsoft, 2012). Sample size calculation for postnatal satisfaction yielded a larger number of women compared with that for labour satisfaction. The SD for the postpartum satisfaction score was 32.82.[19] The detectable difference in postpartum satisfaction scores between women with and without severe morbidity at 1 month was 15. It was decided based on the expertise of the

researchers in the field and the feasibility of the study. The ratio of women without severe morbidity to those with severe morbidity was 1. Assuming an alpha of 0.05 and a power of 80%, the minimum required sample size was 76. However, after considering a non-response rate of 30% during the telephone-based survey[20 21] at 1-month follow-up,[22] the final sample calculated size was 99 women per group.

Postpartum women with and without severe morbidity who fulfilled the inclusion were subsequently included in the exposed and non-exposed groups, respectively. Consecutive sampling was used to select the exposed group given the limited number of exposed women, the possibility of high refusal rates during follow-up and the time constraints of the study. For each exposed woman identified, one non-exposed woman at the approximate time of delivery was selected.

Information was obtained from medical records and face-to-face interviews. The case report form contained responses on (1) sociodemographic characteristics, (2) obstetric and medical histories, (3) the Malay version of the WOMBLSQ and (4) the Malay version of the WOMB-PNSQ. The WOMBLSQ items are rated on a 7-point Likert scale ranging from 'totally disagree' to 'totally agree', with higher scores indicating greater satisfaction.[6] Items were deliberately very positively or negatively worded to enhance the respondent's ability to express minimal dissatisfaction.

The psychometric properties of the Malay version of the WOMBLSQ, which consist of 9 dimensions and 27 questions, were tested using the Rasch model among 200 postpartum women on hospital discharge in a tertiary hospital within Kota Bharu, Kelantan from July until August 2017. Accordingly, results showed high item reliability (0.98) and item separation (7.65), as well as good person reliability (0.78) and person separation (1.90). Item difficulty measured from +1.55 to −1.64 logit with a spread of 3.19 *logit*. Meanwhile, person ability measured from +4.36 to −0.59 *logit* with a spread of 4.95 *logit*. Item distribution had a much lower spread compared with person spread. This revealed that items were targeting the right respondents and had little distortion in measuring latent traits. The produced data were at a reasonable prediction level of the responses to items.[23]

The WOMBPNSQ items are rated on a 7-point Likert scale ranging from 'totally disagree' to 'totally agree', with higher scores indicating greater satisfaction.[24] Items were deliberately very positively or negatively worded to enhance the respondent's ability to express minimal dissatisfaction. The psychometric properties of the Malay version of the WOMBPNSQ, which consists of 11 dimensions and 30 items questionnaire, were tested using the Rasch Model among 195 postpartum women on hospital discharge in a tertiary hospital within Kota Bharu, Kelantan, from August until September 2017. Accordingly, results showed item reliability and item separation of 0.99 and 9.02 and a person reliability and person separation of 0.48 and 0.90, respectively—item

difficulty measured from +0.54 to −0.67 *logit* with a spread of 1.21 *logit*. Meanwhile, person ability measured from +0.70 to −0.31 *logit* with a spread of 1.01 *logit*. Person distribution had a much lower spread compared with item spread. This revealed that the items were targeting the right respondents, had a similar latent trait among postpartum women and had a common perception of satisfaction.[25]

During hospitalisation, women with (exposed) and without (non-exposed) severe maternal morbidity were identified, briefed and subsequently invited into the study. They were allowed to ask questions before signing the consent form and were recruited until the required sample size was satisfied. The medical records of respondents were reviewed to retrieve patients' information. Face-to-face interviews with the WOMBLSQ were done only when the women were medically stable and fit, just before hospital discharge. The women were thanked for their contribution and were provided a small token of appreciation. At 1-month post partum, the women were contacted to complete a structured telephone interview with the WOMBPNSQ. There is no specific time point recommended for the assessment of WOMBPNSQ. Satisfaction is likely to change over time and the postpartum period ranges from immediately after birth to 6 months or even 1 year.[26] The researchers have chosen this time point because the items were relevant for assessment at 1 month and suitable to be answered by the respondents.

Data were entered and analysed using SPSS Statistics, V.24.0. Descriptive analyses were used for the sociodemographic, obstetric and medical characteristics variables. An Independent t-test was used to compare labour satisfaction following childbirth and postnatal satisfaction at 1-month post partum. For objective 1, analysis of variance (ANOVA) and analysis of covariance (ANCOVA) were used to compare outcome scores between women with and without severe maternal morbidity, with labour satisfaction score as the dependent variable. For objective 2, ANOVA and ANCOVA were used to compare outcome scores between women with and without severe maternal morbidity, with postnatal satisfaction score as the dependent variable.

The fixed factor for objectives 1 and 2 was maternal morbidity status, while potential confounders included fetal outcome and parity.[5 27] The confounders were selected a priori based on the literature and clinical knowledge, supporting them as potential risk factors for postnatal satisfaction.

Colour codes grade antenatal mothers according to the severity of risk factors during each antenatal visit using four-colour codes. Red signifies an extreme risk factor that requires immediate hospital referral and admission. Yellow indicates a high-risk factor and needs to be monitored antenatally by specialists. Green suggests a low-risk factor requiring monitoring by a medical officer. The white code indicates pregnancy without risk factors requiring regular follow-up by nursing staff.[28]

Patient and public involvement

It was not appropriate or possible to involve patients or the public in the design, conduct, reporting or dissemination plans of our research.

RESULTS

A total of 198 participants responded following childbirth, yielding a response rate of 100.0%. However, only 193 participants responded 1 month postpartum: 99 without severe maternal morbidity (100.0% response rate) and 94 with severe maternal morbidity (94.9% response rate). Non-responses were attributed to random errors due to the loss of contact with the participants and not related to the complications of maternal morbidity. Table 1 shows the baseline sociodemographic, obstetric and medical characteristics of postpartum women with and without severe maternal morbidity.

Comparison of labour satisfaction following childbirth

An independent t-test comparing the scores for nine dimensions and the general satisfaction dimension of the WOMBLSQ between women with and without severe maternal morbidity revealed no significant difference in all dimensions between both groups (table 2).

ANOVA showed no significant difference in the descriptive mean (SD) of the labour satisfaction scores between women with and without severe maternal morbidity following childbirth (p=0.105) (table 3). Moreover, ANCOVA showed no significant difference in the estimated marginal mean (EMM) of the labour satisfaction scores following childbirth (F statistic=2.47; p=0.118) between women with and without severe maternal morbidity after adjusting for fetal outcome and parity. No significant interaction between variables was observed (p>0.05), while no multicollinearity problem was noted as indicated by a variance inflation factor of less than 10. Residual plots for overall model linearity and equal variance assumption, normality assumption and variable functional form for parity were satisfied, with no outliers being observed.

Comparison of postnatal satisfaction 1-month post partum

An independent t-test comparing scores for the 11 dimensions and general satisfaction dimension of the WOMB-PNSQ between women with and without severe maternal morbidity revealed significant differences for the mean (SD) dimensions on nursing the baby (0.08 (0.024) vs 0.06 (0.029); p=0.022) and professional support (0.03 (0.022) vs 0.03 (0.029); p=0.023) (table 4).

ANOVA showed a significant difference in the descriptive mean of the postnatal satisfaction score between women with and without severe maternal morbidity 1-month post partum (p=0.019; table 5). ANCOVA showed a significant difference in the EMM of the postnatal satisfaction score 1-month post partum (F=5.58; p=0.019) between women with and without severe maternal morbidity after adjusting for fetal outcome

and parity. Women with severe maternal morbidity had higher postnatal satisfaction scores compared with those without severe maternal morbidity (mean difference [95% CI]: 2.9[0.49 to 5.44]). No significant interaction between variables was observed (p>0.05), while no multicollinearity problem was noted, as indicated by a variance inflation factor of less than 10. Residual plots for overall model linearity and equal variance assumption, normality assumption, and variable functional form for parity were satisfied, with no outliers being observed.

DISCUSSION

Severe maternal mortality has been known to have a substantial impact on women's physical and emotional well-being. Considering the potentially life-changing effects of surviving a near-death experience, women have found it challenging to adapt to the morbidities.[29] Trauma and scars left by the event may affect the patients' perception and, therefore, satisfaction.

Interestingly, after adjusting for fetal outcome and parity, the current study found no difference in labour satisfaction following childbirth between women with and without severe maternal morbidity. This could have been attributed to both groups' excellent support, either from a healthcare professional or from family or friends. Obstetric care in Malaysia is provided in primary, secondary and tertiary healthcare facilities with a referral system as the main link. The risk approach strategy ensures professional and medical support to antenatal and postnatal women at every visit. Husband or delivery partner are allowed to be with the women to provide emotional support during childbirth. Several studies have highlighted the impact of good psychosocial support during delivery, contributing to the high satisfaction levels.[12 19 30 31]

Nonetheless, our results revealed a difference in postnatal satisfaction between women with and without severe maternal morbidity 1-month post partum after adjusting for fetal outcome and parity. This could be explained by the significant differences in the 'nursing baby' and 'professional support' dimensions between both groups. In Malaysia, hospital or healthcare staff typically visit a postpartum patient approximately nine or more times throughout the postpartum period depending on the patient had a normal delivery or developed complications.[32] During home visits, nurses must assess the condition of both the mother and the baby. This assessment includes identifying any complications that need a referral, advice on contraception and observation of breastfeeding technique.[32] Patients who developed complications, such as severe maternal morbidity, were given more attention by healthcare professionals, as suggested by the number of home visits or appointments with the doctor at the clinic. With the current adaptation of the family doctor concept in Malaysia, the mother generally receives care from the same team of nurses and doctors throughout

Table 1 Sociodemographic, obstetric and medical characteristics of postpartum women

Variables	SMM (n=99)		Non-SMM (n=99)	
	n	(%)	n	(%)
Sociodemographic				
Age (years)*	31.2	−6.2	29.8	−5.63
Household income (RM)*	3614.1	−1675.21	3532.3	−2303.62
Ethnicity				
Malay	99	−100	97	−98
Non-Malay	0	0	2	−2
Educational level				
Primary and secondary	62	−62.6	46	−46.5
Tertiary	37	−37.4	53	−53.5
Employment status				
Employed	22	−22.2	32	32.3
Non-employed	77	−77.8	67	−67.7
Partner employment status				
Employed	45	−45.5	50	−50.5
Non-employed	54	−54.5	49	−49.5
Obstetric and medical				
Parity*	2.7	−1.57	2.6	−1.67
Period of gestation (week)	38.1	(1. 45)	38.8	−1.39
Hospital stay (day)	4.1	−1.04	2.5	−1.11
Pregnancy status				
Wanted	98	−99	95	−96
Unwanted	1	−1	4	−4
Antenatal care booking				
Early (≤12 weeks)	73	−73.7	84	−84.8
Late (>12 weeks)	26	−26.3	15	−15.2
Colour code				
White	1	−1	3	−3
Green	56	−56.6	85	−85.9
Yellow	34	−34.3	11	−11.1
Red	8	−8.1	0	0
Mode of delivery				
Vaginal delivery	52	−52.5	68	−68.7
Caesarean section	47	−47.5	31	−31.3
Fetal outcome				
Alive	96	−97	98	−99
Dead	3	−3	1	−1
Comorbidity				
Absent	85	−85.9	85	−85.9
Present	14	−14.1	14	−14.1

*Expressed as mean (SD).
SMM, severe maternal morbidity.

Table 2 Dimensions of the Malay version Women's views of birth labour satisfaction questionnaire

| | Following childbirth | | | | |
| | SMM (n=99) | | Non-SMM (n=99) | | P value* |
Dimensions	Mean	SD	Mean	SD	
Professional support	0.16	−0.021	0.16	−0.021	0.287
Expectations	0.12	−0.023	0.12	−0.025	0.185
Holding baby	0.05	−0.026	0.05	−0.025	0.799
Support from partner	0.07	−0.021	0.06	−0.019	0.489
Pain during labour	0.05	−0.033	0.05	−0.036	0.235
Pain after delivery	0.06	−0.023	0.05	−0.026	0.105
Continuity	0.04	−0.021	0.04	−0.02	0.698
Environment	0.04	−0.021	0.03	−0.022	0.264
Control	0.04	−0.029	0.04	−0.022	0.152
General satisfaction	0.54	−0.276	0.47	−0.298	0.308

*Independent t-test.
SMM, severe maternal morbidity.

her pregnancy and the postpartum period, facilitating rapport between the health staff and the patient.

Women with trauma from severe maternal morbidity continued to seek professional advice and support after discharge from hospital,[33] especially on maternal functioning, sexual health and quality of life.[34] Healthcare professionals need to support these mothers since they are at higher risk of impairment in their physical, mental and reproductive health after pregnancy, including an increased risk of death.[35]

Despite having undergone a traumatic birth event, a patient can feel secure when developing a trusting relationship with a healthcare team.[36] However, considering that a trustworthy relationship is a two-way system, healthcare staff should exhibit a caring attitude combined with competence at work to gain their patient's trust.[12 30 31] Other studies have also focused on confidence in medical staff as an essential variable for satisfaction.[37] On the contrary, humiliation, disrespect and unkind treatment or lack of understanding have been identified factors leading to dissatisfaction.[38]

Another dimension that promoted greater satisfaction among participants with severe maternal morbidity was nursing. Most patients with severe maternal morbidity experience a delay from delivery to holding and breastfeeding the newborn. They usually faced more difficulty than patients without severe maternal morbidity

in initiating or sustaining breastfeeding[35] due to fatigue, limited mobility and posture problems.[39] They also need advice and physical and emotional supports to nurse the baby with their condition. Sometimes, a mother who has a goal in breastfeeding the baby has emotional consequences for their inability to achieve the goal due to their limited circumstances.[39]

Patients with complicated deliveries are presumed to have issues during post partum (eg, higher risk for developing complications and problems in caring for a newborn) and should therefore receive increased attention. One of the tasks of nurses during home visits is to assess and provide advice regarding breastfeeding.[32] The best time to assess and re-educate patients regarding breastfeeding is during the home visit. Providing sound advice will encourage patients to breastfeed, increase bonding with the baby, and further increase maternal satisfaction.[19 37]

The current study used established and clearly defined standard identification criteria for severe maternal morbidity. The WHO has proposed maternal morbidity as an indicator for the evaluation and improvement of maternal healthcare services instead of maternal mortality. This study employed a prospective double-cohort approach that explored maternal satisfaction during labour and 1-month post partum. The questionnaires used herein focused on the most relevant aspects

Table 3 Comparison of labour satisfaction score between women with and without severe maternal morbidity following childbirth using analysis of covariance

Groups	n	Desc mean (SD)	EMM (95% CI)	F stat (df)	P value*
SMM	99	68.4 (8.49)	68.4 (66.56 to 70.23)	2.47 (1 to 194)	0.118
Non-SMM	99	66.3 (9.84)	66.3 (64.49 to 68.16)		

*Analysis of covariance; adjusted for fetal outcome and parity.
Desc mean, descriptive mean; EMM, estimated marginal mean; SMM, severe maternal morbidity.

Table 4 Dimensions of the Malay version of Women's views of birth postnatal satisfaction questionnaire

| Dimensions | 1 month post partum | | | | |
| | SMM (n=94) | | Non-SMM (n=99) | | |
	Mean	SD	Mean	SD	P value*
Inpatient stay	0.01	0.027	0.01	0.028	0.961
Maternal health	0.03	0.025	0.02	0.026	0.311
Contraceptive advice	0.05	0.015	0.05	0.013	0.229
Nursing baby	0.08	0.024	0.06	0.029	0.022
Partner support	0.08	0.015	0.07	0.017	0.065
Postnatal visiting	0.06	0.012	0.05	0.017	0.165
Professional support	0.03	0.022	0.03	0.029	0.023
Pain after birth	0.01	0.021	0.01	0.025	0.300
Health visitor care	0.04	0.022	0.04	0.020	0.475
Continuity	0.01	0.032	0.01	0.033	0.682
General practitioner care	0.00	0.021	−0.00	0.019	0.462
General satisfaction	0.74	0.189	0.72	0.217	0.151

*Independent t-test.
SMM, severe maternal morbidity.

Table 5 Comparison of postnatal satisfaction score between women with and without severe maternal morbidity 1-month post partum using analysis of covariance

Groups	n	Desc mean (SD)	EMM (95% CI)	F stat (df)	P value*
SMM	94	62.0 (8.06)	60.8 (56.38 to 65.25)	5.58 (1 to 189)	0.019
Non-SMM	99	59.1 (9.18)	57.8 (53.26 to 62.45)		

*Analysis of covariance; adjusted for fetal outcome and parity.
Desc mean, descriptive mean; EMM, estimated marginal mean; SMM, severe maternal morbidity.

of maternal satisfaction with care during labour and postnatal periods, such as the provision of care from healthcare providers, continuity of care, women's expectation, partner support and pain management, and had been tested across different models and settings of maternity care. This study's limitations were that maternal satisfaction was based on perception, which can be easily affected by various pregnancy outcomes, and that interviews via phone may promote loss of focus among participants when answering a lengthy questionnaire, which may also affect results. Though we have adjusted the fetal outcome and parity for postpartum satisfaction based on evidence from literature, it is possible that we might have missed other important confounders in the analysis.

CONCLUSION

This study showed that healthcare professional support and nursing of babies influenced the relationship between satisfaction and severe maternal morbidity during the later postpartum periods. Future research may replicate our study in other populations to produce more comprehensive results.

ORCID iD
Mohd Noor Norhayati http://orcid.org/0000-0002-6372-1476

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