Prevalence and risk factors of maternal dissatisfaction after vaginal delivery: A multicenter prospective study

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CLINICAL ARTICLE

Prevalence and risk factors of maternal dissatisfaction after vaginal delivery: A multicenter prospective study

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Abstract

Objective: To evaluate the prevalence and risk factors of maternal dissatisfaction 2 days after a singleton vaginal delivery at or near term.

Methods: We conducted a planned ancillary cohort study of the TRanexamic Acid for Preventing Postpartum Hemorrhage After Vaginal Delivery (TRAAP) randomized controlled trial. Maternal dissatisfaction, related to the birth and to the subsequent hospital stay, was assessed 2 days postpartum by two self-administered questions: "Are you satisfied with the care you received during your child's birth?" and "Are you satisfied with the care you have received during your hospital stay?". Satisfaction was defined by answers of "extremely satisfied" or "very satisfied," and dissatisfaction by the responses "moderately satisfied," "not very satisfied," or "not at all satisfied". Their association with maternal dissatisfaction was analyzed by random-effects logistic regression.

Results: The prevalence of maternal dissatisfaction with the birth was 2.9%, and with the hospital stay 9.5%. Characteristics associated with a higher risk of maternal dissatisfaction with the birth were labor exceeding 6 h, bad memories of the birth and, only for women without complicated deliveries, manual examination of the uterine cavity. The only characteristic associated with a higher risk of dissatisfaction with the hospital stay was non-French nationality. None of the postpartum hemorrhage, third- or fourth-degree perineal lacerations, operative vaginal delivery, episiotomy and uterine massage were associated with a higher risk of maternal dissatisfaction.

Conclusion: Maternal dissatisfaction was low after singleton vaginal deliveries at or near term. Strategies aiming to avoid labor longer than 6 h and manual examination of the uterine cavity may decrease maternal dissatisfaction after delivery.

KEYWORDS
bad memories, duration of labor, manual examination of the uterine cavity, maternal dissatisfaction, postpartum hemorrhage, vaginal delivery

1 | INTRODUCTION

The WHO, the International Confederation of Midwives, and the International Federation of Gynecology and Obstetrics all recommend assessing women's satisfaction to improve the quality and effectiveness of perinatal care, which is an important outcome in evaluating policies.[1] Care at all stages of delivery has a significant impact on women's perception of and subsequent satisfaction with their delivery.[2] Childbirth can be a positive experience providing a sense of strength and accomplishment; or a negative experience leaving women with a sense of failure and helplessness.[3,4]

The literature on satisfaction is supported mainly by retrospective qualitative studies[5,6] and/or conducted in low-income countries.[7,8] Few articles come from high-income nations.[9,10] Studies to date have focused mainly on analgesia[11] and place of delivery,[12–14] and then on determinants such as type of delivery[15] and social[16,17] and clinical[9] characteristics. Knowledge about the incidence of maternal dissatisfaction in high-income countries and how obstetric events affect maternal dissatisfaction remains limited, particularly in women with term singleton vaginal deliveries, even though maternal satisfaction is one of the most important outcomes,[18,19] reflecting the feelings of patients rather than health care personnel. Determinants related to maternal dissatisfaction must be identified precisely to improve care and to distinguish the women requiring specific attention. This is especially necessary given the emergence over the past decade of the concept of "obstetrical violence", particularly in high-income countries; any report of a form of violence by health care providers corresponds at a minimum to dissatisfaction with delivery.[20]

We speculated that some characteristics of childbirth, even outside high-risk obstetric situations, may constitute risk factors for maternal dissatisfaction; these might include induced or long labor, an episiotomy, a severe perineal tear, or a postpartum hemorrhage (PPH).

The TRAnexamic Acid for Preventing postpartum hemorrhage after vaginal delivery (TRAAP) trial collected detailed data about prenatal psychiatric history and characteristics of labor and delivery while assessing postpartum satisfaction in women with vaginal deliveries at or near term.[21] The primary objective of this prespecified ancillary analysis was to evaluate the prevalence and risk factors of maternal dissatisfaction with childbirth after a singleton vaginal delivery among participants in the TRAAP trial. Our secondary objective was to evaluate the prevalence and risk factors of maternal dissatisfaction related to the postpartum stay after a singleton vaginal delivery by TRAAP trial participants.

2 | MATERIALS AND METHODS

2.1 | Study design

This prospective study was a prespecified ancillary analysis of the TRAAP trial, a double-blind randomized controlled trial that assessed the efficacy of tranexamic acid for the prevention of PPH after vaginal delivery. Women were randomized to receive 1 g of tranexamic acid or placebo after delivery. From January 1, 2015, through December 31, 2016, the study enrolled women from 15 French maternity units who were in labor, aged 18 years or older, and planning vaginal delivery of a live singleton fetus at 35 weeks of gestation or later.[21] The Ouest II Committee for the Protection of Research Subjects and the French Health Products Safety Agency approved the trial protocol, and the French Ministry of Health supported the trial through the Hospital Clinical Research Program (contract no. PHRCN 1370458N). All women included in the TRAAP trial provided written informed consent.[21]

2.2 | Study population

We included all women enrolled in the TRAAP trial's modified intention-to-treat population (randomized women with vaginal deliveries) who responded to the self-administered questionnaire assessing maternal satisfaction at 2 days after delivery.

2.3 | Data collection

After randomization, the characteristics of labor, delivery, and the third stage of labor were prospectively collected by the midwife or obstetrician handling the delivery, paying special attention to blood loss (main primary and secondary outcomes of the TRAAP trial), measured with a collector bag. Among the postpartum characteristics prospectively collected were neonatal status, maternal hemoglobin level at day 2 postpartum, and satisfaction with the birth, assessed by a French self-administered questionnaire, also on day 2. The other characteristics of the women were retrospectively collected by a research assistant, independent of the local medical team, who manually reviewed the medical records. The quality of the data collected was checked in each center for a 10% random selection of the women included and for all women with PPH.

2.4 | Outcomes

The first endpoint was maternal dissatisfaction with the delivery ("Are you satisfied with the care you received during your child's birth?"). The secondary endpoint was maternal dissatisfaction related to the postpartum hospital stay ("Are you satisfied with the care you received during your stay at the hospital?"). For both endpoints, women used a five-point Likert-type scale to answer these questions ("extremely satisfied", "very satisfied", "moderately satisfied", "not very satisfied" or "not at all satisfied"). We chose to create a binary variable with "satisfied" and "dissatisfied" modalities. A patient was defined as "satisfied" if she answered "extremely satisfied" or "very satisfied," and "dissatisfied" if she answered "moderately," "not very," or "not at all" satisfied.

2.5 | Exposure variables

Three categories of exposure variables were studied: demographic and health history characteristics (age, body mass index [BMI, calculated as weight in kilograms divided by the square of height in meters], place of birth, nationality, smoking status, pre-existing psychiatric history [defined as history of depression, suicide attempt, other psychiatric condition, and psychotropic drug use before and during pregnancy and postpartum], pre-existing hypertensive disorders, pre-existing diabetes, history of miscarriage, abortion, fetal loss, vaginal or cesarean delivery, or PPH), detailed variables related to pregnancy and delivery (complications [thrombocytopenia, gestational diabetes, preterm labor, antenatal bleeding, hypertensive disorders], hospitalization, induction of labor, duration of labor, epidural analgesia, hyperthermia during labor, social support, operative vaginal delivery, episiotomy, perineal tear, uterine massage, manual examination of the uterine cavity, PPH, tranexamic acid arm, neonatal complication) and postnatal variables (breastfeeding, hemoglobin level, and bad memories of delivery on day 2, assessed by the question "Today, what are your memories of your childbirth?" Women answered this question with a five-point Likert-type scale [excellent, good, intermediate, bad, or very bad]. Bad memories of delivery were defined by a "bad" or "very bad" response).[3,4]

2.6 | Statistical analysis

We estimated the prevalence of maternal dissatisfaction at 2 days postpartum. Using the multiple imputation method based on chain equations for missing data, with the mice package in R software, we generated five tables, by five iterations.[22] Associations between potential risk factors and maternal satisfaction were analyzed by random-effects logistic regression. Crude and adjusted odds ratios (ORs) and their 95% confidence intervals (CIs) were calculated. Variables were included in the multivariate analysis if they potentially influenced maternal satisfaction. We built two multivariate models to study the association between our outcome and various factors. The first model contained all variables suspected of association with dissatisfaction (model 1): age, BMI, non-French nationality, history of psychiatric disorder, nulliparity, previous abortion, induction of labor, operative vaginal delivery, labor exceeding 6 h, social support during childbirth, episiotomy, perineal tear, PPH, hyperthermia during labor, any neonatal complication, hemoglobin level below 9 g/dL, smoking during pregnancy, previous miscarriage, previous fetal loss, hospitalization during pregnancy, uterine massage, manual examination of the uterine cavity, and performance of a second-line intervention. A second multivariate model included the first model and the covariate "bad memories of delivery on day 2 postpartum" to assess its independent association with maternal satisfaction (model 2). Seeking to identify factors associated with maternal dissatisfaction among women with what their perinatal professionals considered uncomplicated deliveries, we performed a sensitivity analysis excluding complicated deliveries: operative vaginal deliveries, third- or fourth-degree perineal lacerations, PPH ≥1000 mL. Differences were considered statistically significant at $P < 0.05$. Software R Core Team (2021). _R: A language and environment for statistical computing_. R Foundation for Statistical Computing, Vienna, Austria. <https://www.R-project.org> was used for all analyses (Table 1).

3 | RESULTS

Among the 3891 women participating in the TRAAP trial, 3196 answered the maternal satisfaction question for childbirth on day 2 (82.1% response rate) (Figure 1) and constituted our study population; 3179 answered the maternal satisfaction question for their hospital stay on day 2 (81.7% response rate) (Figure S1).

In multivariate analyses, factors associated with a higher risk of maternal dissatisfaction with childbirth were labor exceeding 6 h (aOR, 2.30; 95% CI: 1.03–5.16; model 1) and bad memories of delivery (aOR, 11.05; 95% CI: 4.45–27.46; model 2), while induction of labor did not reach statistical significance (aOR, 1.94; 95% CI: 0.95–3.97; $P = 0.07$; model 1). Postpartum hemorrhage, perineal tear, episiotomy, and operative vaginal delivery were not associated with maternal dissatisfaction with the birth (Table 2).

Among women with uncomplicated deliveries (47.4%, $n = 1515/3196$), 2.6% ($n = 40/1515$) were dissatisfied with their delivery. In this sensitivity analysis, we identified the following independent risk factors associated with maternal dissatisfaction with the birth: manual examination of the uterine cavity (aOR, 2.76; 95% CI, 1.17–6.53; model 1), labor exceeding 6 h (aOR, 2.29; 95% CI: 1.01–5.20; model 1), and bad memories of the birth on day 2 (aOR, 17.27; 95% CI: 5.60–53.29; model 2) (Table 3).

Also on day 2, 9.5% ($n = 303/3179$) of the women were dissatisfied with their postpartum stay (Figure S1). Table S2 summarizes the characteristics of the women responding to this question, which are similar to those of the respondents to the question about the delivery. Among them, the only factor associated with a higher risk of dissatisfaction with the hospital stay was a non-French nationality (aOR, 2.30; 95% CI: 1.42–3.72 for both models 1 and 2) (Table S3).

4 | DISCUSSION

The overall rate of dissatisfaction among women after a vaginal delivery at or near term in our high-income setting was low, around 3%. We identified two childbirth-related variables associated with a higher risk of maternal dissatisfaction with delivery: long labor and bad memories of childbirth. Maternal dissatisfaction was not associated with operative vaginal delivery, episiotomy, third- or fourth-degree perineal lacerations, or PPH. The rate of dissatisfaction with the postpartum stay was higher—around 10%. The only factor identified with a higher risk of such maternal dissatisfaction was a non-French nationality.

TABLE 1 Characteristics of the women responding to the question about satisfaction with the birth ($n = 3196$), overall and according to their satisfaction.

Characteristics	All $N = 3196$	Satisfied $N = 3103$[a]	Dissatisfied $N = 93$[a]
Demographics			
Age (years)			
Younger than 30	1417 (44.3)	1374 (44.3)	43 (46.2)
30–34	1042 (32.6)	1018 (32.8)	24 (25.8)
35 or older	737 (23.1)	711 (22.9)	26 (28.0)
BMI (kg/m^2)[m]			
< 18.5	231 (7.2)	223 (7.2)	8 (8.6)
18.5–24.9	2105 (65.9)	2051 (66.1)	54 (58.1)
25–29.9	563 (17.6)	543 (17.5)	20 (21.5)
≥ 30 or higher	273 (8.5)	264 (8.5)	9 (9.7)
Place of birth[m]			
Europe	2562 (80.2)	2497 (80.5)	65 (69.9)
Sub-Saharan Africa	125 (3.9)	118 (3.8)	7 (7.5)
North Africa	265 (8.3)	254 (8.2)	11 (11.8)
Asia	69 (2.2)	67 (2.2)	2 (2.2)
Other	98 (3.1)	94 (3.0)	4 (4.3)
Non-French nationality[n]	258 (8.1)	246 (7.9)	12 (12.9)
Smoking[m]	861 (26.9)	834 (26.9)	27 (29.0)
Pre-existing psychiatric disorder[b]	100 (3.1)	97 (3.1)	3 (3.2)
Pre-existing hypertensive disorder	21 (0.7)	21 (0.7)	-
Pre-existing diabetes	11 (0.3)	11 (0.4)	-
Obstetric history			
Nulliparous	1699 (53.2)	1650 (53.2)	49 (52.7)
Previous miscarriage	699 (21.9)	675 (21.8)	24 (25.8)
Previous abortion	471 (14.7)	451 (14.5)	20 (21.5)
Previous fetal loss[c]	89 (2.8)	87 (2.8)	2 (2.2)
Previous cesarean delivery	160 (5.0)	155 (5.0)	5 (5.4)
Previous PPH	146 (4.6)	142 (4.6)	4 (4.3)
Pregnancy, labor, and childbirth characteristics			
Smoking during pregnancy[n]	429 (13.4)	416 (13.4)	13 (14.0)
Complication during pregnancy[d]	774 (24.2)	754 (24.3)	20 (21.5)
Hospitalization during pregnancy[e]	172 (5.4)	165 (5.3)	7 (7.5)
Reason for induction of labor	641 (20.1)	616 (19.9)	25 (26.9)
Premature rupture of the membranes[f]	193 (5.0)	184 (5.5)	9 (7.7)
Fetal heart rate abnormalities[f]	30 (0.9)	28 (0.8)	2 (1.7)
Stained amniotic fluid[f]	4 (0.1)	4 (0.1)	-
Prolonged pregnancy[f]	195 (5.1)	188 (5.6)	7 (5.9)
Decreased fetal movement[f]	51 (1.3)	46 (1.4)	5 (4.2)
Diabetes[f]	68 (1.8)	65 (1.9)	3 (2.5)
Fetal growth restriction[f]	12 (0.3)	12 (0.4)	-
Pre-eclampsia[f]	16 (0.4)	15 (0.4)	1 (0.8)
Intrahepatic cholestasis[f]	8 (0.2)	8 (0.2)	-
Suspected macrosomia[f]	51 (1.3)	50 (1.5)	1 (0.8)
Other maternal pathology[f]	76 (2.0)	7 (0.2)	3 (2.5)

TABLE 1 (Continued)

Characteristics	All $N=3196$	Satisfied $N=3103$[a]	Dissatisfied $N=93$[a]
Other fetal pathology[f]	57 (1.4)	56 (1.6)	1 (0.8)
No medical reason[f]	11 (0.3)	11 (0.3)	-
Operative vaginal delivery	522 (16.3)	504 (16.2)	18 (19.4)
Vacuum[g]	221 (42.3)	213 (42.3)	8 (44.4)
Spatulas[g]	129 (24.7)	126 (25.0)	3 (16.7)
Forceps[g]	148 (28.4)	141 (27.9)	7 (38.9)
Sequential use of instrument[g]	24 (4.6)	24 (4.8)	-
Duration of labor exceeding 6 h[n]	667 (20.9)	642 (20.7)	25 (26.9)
Hyperthermia during labor	263 (8.2)	250 (8.1)	13 (14.0)
Social support during childbirth[h,n]	2915 (91.2)	2839 (91.5)	76 (81.7)
Epidural analgesia	3125 (97.8)	3033 (97.7)	92 (98.9)
Episiotomy	751 (23.5)	727 (23.4)	24 (25.8)
Perineal tear[o]			
First or second degree perineal lacerations	1789 (56.0)	1740 (76.6)	49 (52.7)
Third or fourth degree perineal lacerations	30 (0.9)	29 (0.9)	1 (1.1)
Uterine massage[m]	190 (5.9)	185 (6.0)	5 (5.4)
Manual examination of the uterine cavity	432 (13.5)	417 (13.4)	15 (16.1)
PPH			
500 mL or more	331 (10.4)	321 (10.3)	10 (10.8)
1000 mL or more	109 (3.4)	108 (3.5)	1 (1.1)
Requiring second-line intervention[i]	16 (0.5)	16 (0.5)	-
Tranexamic acid arm[j]	1591 (49.8)	1551 (50.0)	40 (43.0)
Neonatal complication[k]	156 (4.9)	149 (4.8)	7 (7.5)
Postpartum period			
Breastfeeding on day 2	2156 (67.5)	2086 (67.2)	70 (75.3)
Hemoglobin level <9 g/dL at day 2[n]	195 (6.1)	187 (6.0)	8 (8.6)
Bad memories of delivery on day 2[l,m]	93 (2.9)	79 (2.5)	14 (15.1)

Note: BMI, calculated as weight in kilograms divided by the square of height in meters. Data are *n* (%).

Abbreviations: BMI, body mass index; PPH, postpartum hemorrhage.

[a]A woman was classified as "satisfied" if she answered "extremely satisfied" or "very satisfied," and "dissatisfied" if she answered "moderately satisfied," "not very satisfied," or "not at all satisfied" at the question "Are you satisfied with the medical care you received during your childbirth?"

[b]History of depressive syndrome, attempted self-harm, attempted suicide or other psychiatric pathology.

[c]Defined as previous stillbirth or termination of pregnancy for medical reasons.

[d]Defined as thrombocytopenia, gestational diabetes, preterm labor, antenatal bleeding, hypertensive disorders.

[e]Except for preterm labor.

[f]Among women with an induction of labor.

[g]Among women with an operative vaginal delivery.

[h]Defined as presence of a partner.

[i]Defined as the use of an intrauterine balloon, embolization, surgery, or transfer to intensive care unit.

[j]Randomized in the intervention arm of the TRAAP trial (injection of 1 g of tranexamic acid after delivery).

[k]Defined as respiratory support, transfer to neonatal intensive care unit, or neonatal death.

[l]Defined as "bad" or "very bad" memories of childbirth on day 2.

[m]Missing data (<5%): BMI ($n=24$), place of birth ($n=77$), smoking ($n=6$), uterine massage ($n=50$), bad memories at day 2 ($n=6$).

[n]Missing data (>5%): non-French nationality ($n=184$), duration of labor ($n=318$), hemoglobin level on day 2 ($n=315$), social support during childbirth ($n=191$), perineal tear ($n=1377$).

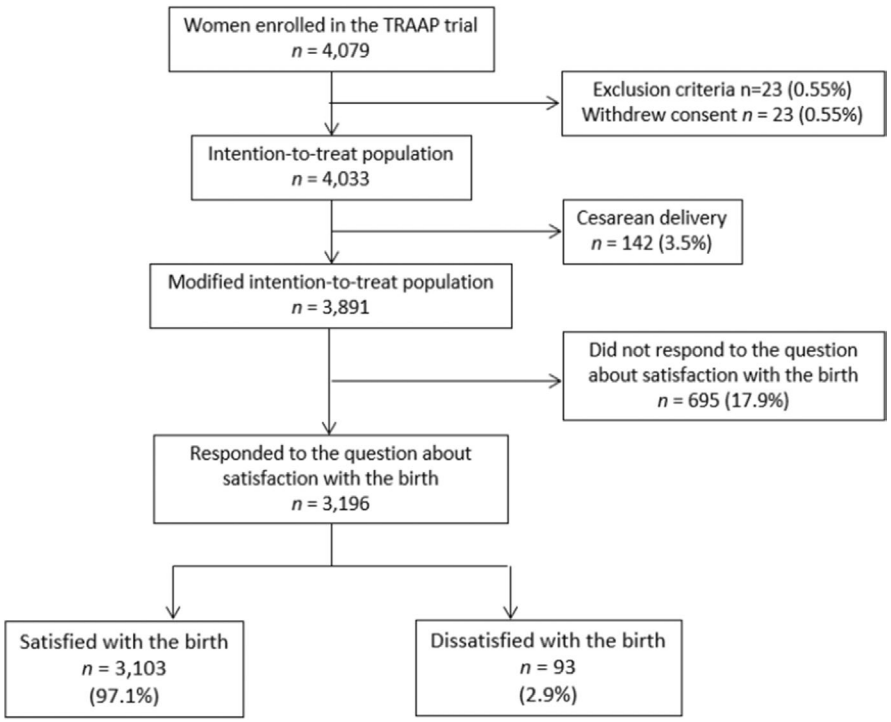

FIGURE 1 Flow chart of the women included in the study of dissatisfaction. TRAAP, TRAnexamic Acid for Preventing postpartum hemorrhage after vaginal delivery.

Our results are consistent with another French study assessing maternal satisfaction after delivery. In that prospective multicenter study including 424 women, 80.9% responded to a questionnaire at 6 weeks postpartum, and 92.5% reported they were satisfied with the delivery.[23] The results are also consistent with those of a Swedish study of 16 775 women; it reported a 94.3% rate of maternal satisfaction with delivery, measured 1 or 2 days afterwards by a visual analog scale.[24] A US study of 500 women found that only 59.6% had a "high" satisfaction score (≥9 on a scale from 0 to 10).[9]

Similarly, our results about the factors associated with maternal postpartum dissatisfaction with childbirth are consistent with some pre-existing studies, particularly for the increased risk when labor is long and the memories are bad.[25,26] However, we failed to find other reported risk factors for maternal dissatisfaction applicable to our population, unlike some studies assessing satisfaction by self-questionnaires[19] or analog scales.[24] Specifically, we did not find a significant risk of dissatisfaction associated with lack of social support during childbirth,[19] or PPH, or induction of labor,[24] although a non-significant increase was associated with the latter.

We conducted a sensitivity analysis only for the women whose childbirth was uncomplicated to attempt to unmask possible risk factors for dissatisfaction not identified in the total population. Interestingly, among those women, manual examination of the uterus was associated with a higher risk of dissatisfaction, even though more than 90% of these women received epidural analgesia. While we did not identify other studies suggesting that manual exploration of the uterus might be associated with dissatisfaction, a strong biologic rationale obviously exists, related to a procedure that may be experienced as uncomfortable, even painful, especially if insufficiently explained to the patient. This result may encourage caregivers to pay particular attention to pain management[27] and to explaining the procedure's purpose and methods: it is their communication with the woman and her involvement in the decision that ensures satisfaction.[28]

Only one factor was significantly associated with dissatisfaction with the postpartum stay — non-French nationality. This result is consistent with the existing literature showing that determinants such as place of residence,[28–30] ethnic origin,[29] and being a migrant (a potential proxy for non-French nationality)[31,32] are associated with maternal dissatisfaction with postpartum hospitalization. In particular, Rudman et al. determined satisfaction profiles based on various aspects of the stay, such as interpersonal care, time spent on physical examinations, time spent on information and assistance, and time spent on discussing and breastfeeding.[30] They found migrant women were among the most dissatisfied. Almeida et al. also found that migrant women were dissatisfied with the care provided by administrative and medical staff more often than nonmigrants.[33] It has been speculated that expectations of care, the role of professionals, communication difficulties, lack of knowledge of migrant women's rights, and inappropriate behavior by health care professionals may play a role in dissatisfaction with this stay.[9,34–36] Although direct and indirect discrimination is recognized as an important source of health care disparities, professionals still find it difficult to recognize.[16,31] Thus, additional efforts are needed to ensure that women receive comprehensive and appropriate information from their

TABLE 2 Factors associated with maternal dissatisfaction with delivery at 2 days after vaginal delivery ($n = 3196$).

		Model 1[a]		Model 2[a]	
Characteristics	**Crude OR (95% CI)[i]**	**aOR (95% CI)[i]**	***P* value[i]**	**aOR (95% CI)[i]**	***P* value[i]**
Demographics					
Age					
Younger than 30	1.35 (0.81–2.24)	0.87 (0.43–1.77)	0.701	0.89 (0.43–1.83)	0.748
30–34	Ref	Ref		Ref	
35 or older	1.54 (0.88–2.70)	0.98 (0.45–2.14)	0.958	0.91 (0.41–2.04)	0.818
BMI					
Lower than 18.5	1.34 (0.63–2.87)	0.88 (0.21–3.81)	0.870	0.96 (0.22–4.20)	0.959
18.5–24.9	Ref	Ref		Ref	
25–29.9	1.46 (0.87–2.44)	2.08 (0.94–4.58)	0.069	1.79 (0.78–4.11)	0.167
30 or higher	1.29 (0.63–2.65)	2.20 (0.84–0.78)	0.109	2.12 (0.78–5.75)	0.140
Non-French nationality	**1.84 (1.02–3.33)**	1.53 (0.63–3.76)	0.348	1.54 (0.62–3.86)	0.352
Smoking during pregnancy	1.12 (0.71–1.77)	0.90 (0.44–1.84)	0.762	0.95 (0.46–1.97)	0.886
Pre-existing psychiatric disorder[b]	1.07 (0.33–3.46)	1.17 (0.26–5.29)	0.838	0.92 (0.18–4.72)	0.920
Nulliparous	0.97 (0.64–0.47)	0.68 (0.34–1.36)	0.274	0.65 (0.32–1.32)	0.235
Previous miscarriage	1.25 (0.78–2.00)	1.04 (0.52–2.08)	0.905	1.08 (0.53–2.19)	0.839
Previous abortion	1.59 (0.96–2.64)	1.73 (0.84–3.55)	0.134	1.63 (0.78–3.40)	0.194
Previous fetal loss[c]	0.75 (0.18–3.08)	1.71 (0.39–7.50)	0.479	1.75 (0.38–8.00)	0.473
Pregnancy, labor, and childbirth characteristics					
Hospitalization during pregnancy[d]	1.45 (0.66–3.18)	1.03 (0.30–3.54)	0.962	1.16 (0.33–4.12)	0.816
Induction of labor	1.46 (0.91–2.34)	1.94 (0.95–3.97)	0.070	1.55 (0.73–3.29)	0.253
Operative vaginal delivery	1.24 (0.73–2.09)	1.60 (0.69–3.71)	0.275	1.31 (0.53–3.25)	0.553
Duration of labor longer than 6 h	1.43 (0.91–2.25)	**2.30 (1.03–5.16)**	**0.042**	1.88 (0.80–4.41)	0.147
Social support during childbirth[e]	0.52 (0.21–1.32)	0.73 (0.17–3.20)	0.676	0.79 (0.18–3.54)	0.755
Episiotomy	1.16 (0.72–1.87)	0.92 (0.30–2.81)	0.887	0.64 (0.19–2.20)	0.483
Perineal tear					
First or second degree perineal lacerations	Ref	Ref		Ref	
Third or fourth degree perineal lacerations	1.27 (0.17–9.45)	1.35 (0.16–11.38)	0.781	1.64 (0.18–15.09)	0.664
Uterine massage	0.86 (0.35–2.15)	0.16 (0.02–1.37)	0.095	0.14 (0.0–1.25)	0.078
Manual examination of the uterine cavity	1.25 (0.71–2.19)	2.04 (0.86–4.79)	0.104	1.93 (0.79–4.71)	0.149
PPH—1000 mL or more	0.32 (0.04–2.31)	0.81 (0.09–7.30)	0.854	0.46 (0.04–5.26)	0.533
Requiring second-line intervention[f]	0.82 (0.54–1.24)	1.43 (0.61–3.35)	0.411	1.37 (0.56–3.32)	0.490
Hyperthermia during labor	1.89 (1.03–3.45)	1.90 (0.82–4.42)	0.134	1.85 (0.76–4.47)	0.174
Neonatal complication[g]	1.59 (0.72–3.50)	1.74 (0.63–4.80)	0.285	1.85 (0.64–5.34)	0.256
Hemoglobin level <9 g/dL	1.30 (0.62–2.73)	0.67 (0.18–2.43)	0.544	0.64 (0.17–2.44)	0.514
Bad memories of delivery[h]	6.85 (3.70–12.68)	-	-	**11.05 (4.45–27.46)**	**<0.001**

Note: BMI, calculated as weight in kilograms divided by the square of height in meters.

Abbreviations: aOR, adjusted odds ratio; BMI, body mass index; OR, odds ratio; PPH, postpartum hemorrhage.

[a]Age, BMI, non-French nationality, history of psychiatric disorder, nulliparous, previous abortion, induction of labor, operative vaginal delivery, duration of labor exceeding 6 h, social support during childbirth, episiotomy, perineal tear, PPH, hyperthermia during labor, neonatal complication, hemoglobin level <9 g/dL, smoking during pregnancy, previous miscarriage, previous fetal loss, hospitalization during pregnancy, uterine massage, manual examination of the uterine cavity, second-line intervention (model 1), model 1 + bad memories (model 2).

[b]History of depressive syndrome, attempted self-harm, attempted suicide, or other psychiatric pathology.

[c]Defined as previous stillbirth or termination of pregnancy for medical reasons.

[d]Except for preterm labor.

[e]Defined as presence of a partner.

[f]Defined as the use of an intrauterine balloon, embolization, surgery, or transfer to intensive care unit.

[g]Defined as respiratory support, transfer to neonatal intensive care unit, or neonatal death.

[h]Defined as "bad" or "very bad" memories of childbirth on day 2.

[i]Random-effects logistic regression.

TABLE 3 Sensitivity analysis excluding operative vaginal deliveries, third or fourth degree perineal lacerations, HPP ≥1000 mL ($n = 1515$).

		Model 1[a]		Model 2[a]	
Characteristics	**Crude OR (95% CI)[h]**	**aOR (95% CI)[h]**	***P* value[h]**	**aOR (95% CI)[h]**	***P* value[h]**
Demographics					
Age					
Younger than 30	0.94 (0.46–1.95)	1.09 (0.51–2.36)	0.819	1.04 (0.47–2.29)	0.927
30–34	Ref	Ref		Ref	
35 or older	1.05 (0.46–2.40)	0.91 (0.39–2.16)	0.838	0.83 (0.34–2.01)	0.676
BMI					
>18.5	0.45 (0.06–3.23)	0.56 (0.08–4.18)	0.577	0.65 (0.09–4.91)	0.679
18.5–24.9	Ref	Ref		Ref	
25–29.9	1.64 (0.77–3.48)	1.64 (0.75–3.59)	0.215	1.54 (0.68–3.49)	0.296
30 or higher	**2.44 (1.02–5.81)**	2.27 (0.92–5.61)	0.076	2.34 (0.92–5.96)	0.075
Non-French nationality	2.34 (0.98–5.59)	2.03 (0.82–5.05)	0.128	2.10 (0.82–5.37)	0.123
Smoking during pregnancy	0.70 (0.33–1.48)	0.75 (0.34–1.64)	0.464	0.84 (0.37–1.87)	0.664
Pre-existing psychiatric disorder[b]	0.99 (0.13–7.20)	0.87 (0.11–7.02)	0.894	1.04 (0.13–8.34)	0.969
Nulliparous	0.67 (0.35–1.27)	0.61 (0.28–1.30)	0.198	0.62 (0.28–1.33)	0.218
Previous miscarriage	1.09 (0.53–2.24)	0.96 (0.45–2.03)	0.908	1.08 (0.49–2.34)	0.854
Previous abortion	1.08 (0.47–2.44)	0.99 (0.42–2.34)	0.985	0.86 (0.35–2.11)	0.737
Previous fetal loss[c]	1.96 (0.46–8.35)	2.18 (0.48–9.76)	0.310	2.60 (0.58–11.79)	0.214
Pregnancy, labor, and childbirth characteristics					
Hospitalization during pregnancy[d]	1.49 (0.45–4.93)	1.30 (0.37–4.49)	0.681	1.40 (0.39–5.09)	0.607
Induction of labor	**2.07 (1.06–4.05)**	1.84 (0.90–3.76)	0.093	1.47 (0.69–3.15)	0.319
Labor exceeding 6 h	1.51 (0.75–3.07)	**2.29 (1.01–5.20)**	**0.047**	1.88 (0.79–4.48)	0.152
Social support during childbirth[e]	1.41 (0.19–10.21)	1.40 (0.18–10.51)	0.746	1.79 (0.22–14.78)	0.587
Episiotomy	0.60 (0.08–4.34)	0.54 (0.07–4.19)	0.558	0.40 (0.05–3.31)	0.394
Uterine massage	0.52 (0.07–3.74)	0.23 (0.03–1.90)	0.173	0.19 (0.02–1.86)	0.155
Manual examination of the uterine cavity	2.18 (0.98–4.86)	**2.76 (1.17–6.53)**	**0.021**	2.38 (0.95–5.95)	0.063
Hyperthermia during labor	2.00 (0.77–5.22)	1.71 (0.62–4.73)	0.300	1.60 (0.55–4.60)	0.394
Neonatal complication[f]	2.39 (0.82–6.97)	2.11 (0.68–6.53)	0.195	2.76 (0.88–8.60)	0.080
Hemoglobin level<9 g/dL	1.01 (0.31–3.32)	0.75 (0.17–3.35)	0.707	0.63 (0.13–2.99)	0.563
Bad memories of delivery[g]	17.01 (6.35–45.58)	-	-	**17.27 (5.60–53.29)**	**<0.001**

Note: BMI, calculated as weight in kilograms divided by the square of height in meters. Bold values represents significance of $p < 0.05$.

Abbreviations: aOR, adjusted odds ratio; BMI, body mass index; OR, odds ratio; PPH, postpartum hemorrhage.

[a]Age, BMI, non-French nationality, history of psychiatric disorder, nulliparous, previous abortion, induction of labor, operative vaginal delivery, labor exceeding 6 h, social support during childbirth, episiotomy, perineal tear, PPH, hyperthermia during labor, neonatal complication, hemoglobin level less than 9 g/dL, smoking during pregnancy, previous miscarriage, previous fetal loss, hospitalization during pregnancy, uterine massage, manual examination of the uterine cavity, second-line intervention (model 1), model 1 + bad memories (model 2).

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[g]Defined as "bad" or "very bad" memories of childbirth on day 2.

[h]Random-effects logistic regression.

health care providers. These elements are likely to be necessary for a postpartum stay mothers find satisfactory.

Reassuringly, our results found that vaginal delivery in high-income countries where labor can be intensively medicalized was associated with a low rate of maternal dissatisfaction, and only a few characteristics of labor were associated with it. However, perinatal professionals should be aware that women whose labor is long and to a lesser extent those whose labor is induced for

medical reasons, such as the need for cervical ripening, as previously reported,[37] may be dissatisfied with their delivery and may require counseling and support.[38] Moreover, a simple question, "Today, what are your memories of your child's birth?" appears to be a quick and effective screening tool to identify women dissatisfied by this experience.

Additional studies assessing the association between maternal dissatisfaction and the duration or induction of labor (the latter increases the former) are required because of the increase in induction rates in many countries since the ARRIVE trial[39] was published in 2018 as well as to differentiate the impact of the indications for induction or the intervention itself, or both on maternal satisfaction. How patients experience their care has become an important health indicator, and ongoing research and evaluation of interventions are required to improve their satisfaction.[40–42]

Our study's principal strengths were its prospective design and the size of its sample—larger than most of the available literature. The prospective collection of detailed data regarding labor and delivery allowed us to characterize obstetric exposures accurately, in particular blood loss (the TRAAP trial's primary outcome). The quality of these data, extracted from the RCT database, has been checked.[21] This ancillary study was prespecified along with the collection of other important risk factors. Moreover, although our study population came from an RCT, its characteristics were similar to those of a general population of parturients with an uneventful pregnancy and a term or near-term singleton vaginal delivery.[32] The 82.1% response rate to the satisfaction questions is further evidence of the strength of the data.

Our study had some limitations. First, our study population was drawn from the participants of an RCT. Women who agree to participate in an RCT may differ from the general population. The differences between respondents and nonrespondents for some characteristics suggest a potential selection bias, which might have resulted in underestimating the rate of maternal dissatisfaction with the birth. Moreover, maternal satisfaction was not measured with a validated questionnaire assessing its various components, as it is in the Women's Views of Birth Labor Satisfaction Questionnaire, Childbirth Experience Questionnaire, and Labor and Delivery Index.[43] Nonetheless, our two self-administered questions, one addressing maternal satisfaction with the delivery process and the other satisfaction related to the postpartum hospital stay enabled us to explore specifically the incidence and determinants of these two different events, which are not usually explored separately by the questionnaires listed above. Maternal satisfaction was measured on day 2 postpartum, as in the other studies assessing this outcome. This choice may have been too early after childbirth. Because some women may require a longer period of reflection, this choice might have induced a classification bias in our study. Finally, we did not study some other components that might impair women's satisfaction, such as types of inappropriate behavior by health care workers, including the failure to consider pain or to share decision making,[17,38] and lack of respect.[44] However, our analysis focused on obstetric factors whose association with maternal dissatisfaction after childbirth is poorly documented. A final relevant component we did not consider was the mother's perception of personal control during labor and childbirth.[45]

AUTHOR CONTRIBUTIONS

Marie Tartaglia: Formal analysis, methodology, software, writing—original draft. **Alizée Froeliger**: Conceptualization, data curation, methodology, writing—review and editing. **Fleur Delva**: Methodology, writing—review and editing. **Hugo Madar**: Writing—review and editing. **Hanane Bouchghoul**: Writing—review and editing. **Catherine Deneux-Tharaux**: Funding acquisition, investigation, writing—review and editing. **Loïc Sentilhes**: Conceptualization, funding acquisition, investigation, methodology, supervision, validation, writing—review and editing.

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CONFLICT OF INTEREST STATEMENT

Loïc Sentilhes has conducted consultancy work and lectured for Ferring Laboratories, GlaxoSmithKline, and Bayer, as well as lectured for Norgine in the past 3 years. The other authors do not report any potential conflicts of interest.

DATA AVAILABILITY STATEMENT

Research data are not shared.

TRIAL REGISTRATION

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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