RESEARCH ARTICLE

Inequalities in childbirth experiences: A population-based cross-sectional survey in England during the Covid-19 pandemic

[version 1; peer review: 1 approved with reservations]

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Abstract

Background

Recognising and addressing inequalities in maternity experiences is crucial to ensuring equitable maternity care and optimal outcomes for all women and their families. This study aimed to compare the childbirth experiences of women with different sociodemographic characteristics using data from a population-based cross-sectional survey in England.

Methods

Analysis was conducted using data from a national maternity survey in England (N = 4,611). Respondents had given birth in May 2020, during the first wave of the Covid-19 pandemic. Modified Poisson regression was used to estimate adjusted risk ratios (aRR) for the association between maternal sociodemographic characteristics and childbirth experiences, with adjustment for birth-related factors.

Results

The majority of women reported positive childbirth experiences and satisfaction with their maternity care. For a significant minority of women, however, childbirth experiences were unsatisfactory. After mutual adjustment for sociodemographic factors and birth-related factors, identifying as a minority ethnic group (aRR range=1.41–2.74)

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and not cohabiting with the baby's other parent (aRR range=1.52–1.99) were associated with poorer childbirth experiences. In addition to these sociodemographic factors, primiparity (aRR range=1.28–1.40) and instrumental birth (aRR range=1.42–2.77) or unplanned caesarean section (aRR range=1.83–3.88) were associated with poorer childbirth experiences.

Conclusions

A significant minority of women have poor childbirth experiences and are dissatisfied with their care. Sociodemographic characteristics and birth-related factors are both important in determining differences in childbirth experiences. Improved understanding of inequalities in childbirth experiences can help to inform interventions and policies to deliver better care to all women.

Plain Language Summary

All women have the right to good quality care during childbirth, yet childbirth experiences can vary for different groups of women. This study compared the childbirth experiences of women with different social and demographic characteristics using data from a national maternity survey in England.

We conducted a paper and online survey of women who gave birth in England during May 2020, which was during the first wave of the Covid-19 pandemic. We contacted women six months after childbirth to ask about their childbirth experiences. We also collected data on women's social and demographic characteristics, including age, education, ethnicity, country of birth, marital/cohabiting status, and the level of deprivation in the area where they lived.

We found that most women reported positive experiences of childbirth and satisfaction with their maternity care. For a minority of women, however, childbirth experiences were unsatisfactory. We also found that those women who identified as a minority ethnic group and who were not cohabiting with the baby's other parent were more likely to report poorer childbirth experiences. In addition, first time mothers and those who had an instrumental birth or an unplanned caesarean section were also more likely to report poorer childbirth experiences.

Keywords

Midwifery; Perinatal care; Maternal Health Services; Healthcare Disparities; Healthcare Inequalities; Surveys and Questionnaires

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Background

Despite advancements in maternity care, sociodemographic inequalities in perinatal outcomes persist. The latest UK confidential enquiry into maternal deaths between 2019 and 2021 showed significant ethnic and social variations in maternal mortality, with women of Asian and Black ethnicity being two to four times as likely as women of White ethnicity to die during or shortly after pregnancy[1]. In addition, women living in the least advantaged areas are twice as likely to die as women living in the most advantaged areas[1]. The National Maternity and Perinatal Audit (NMPA) demonstrated similar variations in neonatal outcomes including stillbirth, preterm birth, and neonatal admission for babies born to women from different ethnic and socioeconomic groups[2].

Variations in childbirth experiences can act as important and modifiable drivers to observed inequalities in perinatal outcomes[3]. The World Health Organization (WHO) recommends the same standard of maternity care for all women (WHO, 2018) and emphasises the importance of having a positive childbirth experience for the short- and longer-term health and wellbeing of women and their families[4,5]. The childbirth experience is multifaceted comprising objective birth events and subjective experience of the birth. Objective events, such as mode of birth and obstetric interventions, and broader and more subjective experience, such as perceived care from staff, involvement in decision-making, and satisfaction with care, can both vary according to sociodemographic characteristics. Women who are younger, less socioeconomically advantaged, and from minority ethnic backgrounds have been found to be at greater risk of poor childbirth experiences[6–8]. Furthermore, research conducted during the pandemic-era suggests that the disruption to maternity services and the restrictive measures introduced in maternity settings may have had a disproportionate effect on women with certain sociodemographic characteristics[9], leading to an exacerbation of the disparities in childbirth experiences.

In addition to driving inequalities in perinatal outcomes, negative childbirth experiences have been linked to many adverse psychosocial outcomes, including postnatal depression[10], postnatal posttraumatic stress[11,12], fear of future childbirth[13], less favourable maternal caregiving attitudes and behaviours[14], and mother-child bonding difficulties[15]. These outcomes can in turn impact the longer-term health and development of the child[16,17].

Recognising and addressing inequalities is crucial to ensuring equitable maternity care and optimal outcomes for all women and their families. The aim of this study was to compare the childbirth experiences of women with different sociodemographic characteristics who gave birth during the pandemic using data from the 2020 national maternity survey in England[18].

Methods

Patient and Public Involvement

National maternity surveys are carried out by the National Perinatal Epidemiology Unit (NPEU) as part of an ongoing programme of research. The 2020 survey was undertaken by the Policy Research Unit in Maternal and Neonatal Health and Care (PRU-MNHC) which includes two Parent, Patient and Public Involvement and Engagement (PPPIE) co-leads as part of the core team. The PPPIE co-leads were involved in the design and planning of the 2020 survey from the outset and drew on the vast PPPIE network of the PRU-MNHC to gain additional input to the study. PPPIE input was sought throughout the project and particularly for the design of study materials, selection of questions and measures to be included in the questionnaire, interpretation of survey findings, drafting of lay and infographic summary reports, and planning the dissemination strategy for the survey findings. In addition to the PPPIE strategy which was devised for the 2020 survey, the 2020 survey was based on earlier surveys carried out by the NPEU, which have all relied on extensive PPPIE and user input.

Design and participants

This study analysed data from the 2020 national maternity survey, a large population-based cross-sectional survey of women's health and maternity care during pregnancy, labour and birth, and the postnatal period. A random sample of 16,050 women was identified by the Office for National Statistics (ONS) from birth registration records. The sample size was based on the response rate to previous surveys taking into account the trend in falling response rates and was selected to ensure we could estimate the prevalence of most outcomes with reasonable precision and have adequate power to compare key outcomes in different groups of women. Women were eligible if they were aged 16 years or over and had given birth in England during May 2020, which was during the first Covid-19 "lockdown" in the UK. Women were six months postpartum at the time of recruitment. The survey was sent out via post in November 2020 and women were able to take part on paper, by telephone (with an interpreter if required), or online. Non-respondents were sent up to two reminders and the survey closed in March 2021. Prior to all mailings, checks on infant deaths were made by ONS and any women whose babies had died were excluded.

Sociodemographic factors

ONS provided sociodemographic data for the whole sample of women to enable comparison of the respondents and non-respondents. These data included maternal age, country of birth, marital status at the time the birth was registered (registration status), and socioeconomic deprivation based on the index of multiple deprivation (IMD), a measure of relative small area-based deprivation across England. In addition to the sociodemographic data supplied by ONS, women who responded to the survey were asked to identify their ethnic group and to indicate the length of time they had lived in the UK if they were born outside the UK. Women were also asked to indicate their age when they completed full-time education.

For the analysis, maternal age was grouped into three categories: younger than 25 years; between 25–34 years; or 35 years and older. Registration status was grouped into three categories: married; joint registration and parents living at the same

address; or joint registration and parents living at different addresses/sole registration. Ethnicity was grouped into eight categories: White British; White Other; Indian; Pakistani; Bangladeshi; Black African; Black Caribbean; or Mixed/Multiple/Other. These ethnic groups were selected to enable a more detailed analysis and to avoid merging women from ethnic groups who may report diverse childbirth experiences. We included a Mixed/Multiple/Other group for women who did not identify with any of the ethnic groups specified above, but the results for this group were not interpreted in the analysis due to high heterogeneity. Country of birth was grouped into born in the UK or born outside of the UK. Those women who were born outside of the UK were further categorised according to how recently they migrated: migrated to the UK more than four years previously (before 2017) or four or fewer years previously (2017 or later). This cut-off was selected to explore experiences for women who had migrated to the UK relatively recently (women who would have been in the UK for approximately 1.5–3 years prior to becoming pregnant in 2019), and also as a pragmatic choice informed by the distribution of time since arrival while allowing for adequate sample sizes in each group for analysis. Socioeconomic deprivation was grouped according to quintiles on the IMD: 1 (least advantaged) to 5 (most advantaged). Education was grouped into three categories: completed full-time education aged 16 years or younger; aged 17 or 18 years; or aged 19 years or older.

Birth-related factors

Four birth-related factors were adjusted for in the analysis: parity (primiparous or multiparous), type of birth (single or multiple), mode of birth (vaginal, instrumental, planned Caesarean section, or unplanned Caesarean section), and gestation at birth (pre-term or term).

Childbirth experience outcomes

Women were asked about their experiences during labour and childbirth. The analysis included two composite outcomes and two single outcomes:

1. Perceived care from staff during labour and birth (composite outcome). This outcome is based on the question "Thinking about the care you received from staff during your labour and birth, how did the staff behave towards you?" Respondents are asked to consider five different aspects of staff behaviour (listed below) and each of these aspects has three response options: not at all (0), sometimes (1), or always (2). Higher scores indicate better perceived care and, for the analysis, the outcome was grouped into two categories using a cut-off point of 5/6: poorer perceived care (0–5) and better perceived care (6–10). This cut-off was selected because a score of 6 or more indicates that at least one aspect of staff behaviour had always been experienced.

- Talked to me in a way I could understand
- Listened to me
- Treated me with respect
- Treated me with kindness
- Treated me as an individual

2. Birth satisfaction on the Birth Satisfaction Scale - Revised Indicator (BSS-RI)[19] (composite outcome). The BSS-RI is a validated scale based on six questions (listed below), each of which has three response options: agree, agree to some extent, disagree (scored 0–2 with reverse scoring on some items). Higher scores indicate greater satisfaction with care and, for the analysis, the outcome was grouped into two categories using the median score as the cut-off point: lower satisfaction (0–7) and higher satisfaction (8–12). The median has previously been used as a cut-off on the BSS-R[20].

- I was not distressed at all during labour
- I felt very anxious during my labour and birth
- I felt well supported by staff during my labour and birth
- I found giving birth a distressing experience
- I felt out of control during my birth experience
- The staff communicated well with me during labour

3. Childbirth experience compared to expectations (single outcome). This outcome is based on the question "Overall, how do you feel your labour and birth went?" which has three response options: worse than you expected; more or less as you expected; better than you expected. For the analysis, the outcome was grouped into two categories: worse than expected or as expected/better than expected, as has been used previously[21].

4. Overall satisfaction with care during labour and birth (single outcome). This outcome is based on the question "Overall, how satisfied or dissatisfied were you with the maternity care you received during your labour and birth?" which has five response options: very satisfied; satisfied; neither satisfied nor dissatisfied; dissatisfied; or very dissatisfied. For the analysis, the outcome was grouped into two categories: very dissatisfied/dissatisfied or other, as has been used previously[22].

Analysis

For each of the childbirth outcomes, proportions and 95% confidence intervals (CI) were estimated for women from different sociodemographic groups who reported: 1) poorer perceived care during labour and birth (scoring ≤5 across the five aspects of staff behaviour); 2) lower satisfaction with care during labour and birth (scoring below the median score of 8 on the BSS-RI); 3) the birth experience was worse than expected; and 4) dissatisfaction with overall care during labour and birth. These proportions and 95% CIs are presented using a series of bar charts.

As most of the outcomes were common, univariable modified Poisson regression was used to estimate risk ratios for the association between each of the sociodemographic factors and each of the childbirth experience outcomes[23]. Primarily, we wanted to explore how each of the sociodemographic factors contributed to the variation in childbirth experiences, therefore we used

multivariable modified Poisson regression to mutually adjust for the sociodemographic factors (model 1). We also wanted to take account of birth-related factors that are known to be associated with childbirth experience and sociodemographic factors, and so we also adjusted for parity, type of birth, mode of birth, and gestation at birth in the multivariable model (model 2).

All analyses were conducted in Stata version 17.6[24] using survey-weighted commands to allow for non-response weights. Less than 1.5% of data were missing for each of the sociodemographic factors and between 0.9% and 3.9% of data were missing for the childbirth experience outcomes. As the amount of item non-response was low in comparison with unit non-response, a complete case analysis with survey weights was employed.

Results

Characteristics of respondents

Weighted summary data describing the characteristics of the overall sample of women who responded to the 2020 national maternity survey (N=4,611) are presented in Table 1. The majority of women were aged between 25 and 34 years and the median age was 32 years (IQR=29-36 years). Over half of women registered the birth of their baby as a married couple (51.7%) and a further third (32.7%) registered the birth as both parents living at the same address. Two-thirds of women identified as White British (67.1%). Over-two-thirds of women were born in the UK (70.1%), 23.1% were born outside the UK and migrated to the UK before 2017, and 6.8% were born outside the UK and migrated to the UK in 2017 or later. The women who were born outside of the UK came from many parts of the world, principally Poland (7.3%), India (5.8%), Pakistan (5.5%), Nigeria (5.3%), Romania (4.6%) and Germany (4.5%). Just under half of the respondents were living in areas in the two least advantaged quintiles on the IMD (47.5%). Over half of women left full-time education when they were aged 19 years or older (57.7%).

Table 1 also presents the population-level distribution of these sociodemographic factors (where available), based on the overall sample of women from ONS (respondents and non-respondents) or on data from women aged 15–49 years in the 2021 census[25]. The weighted distributions of characteristics for survey respondents are similar to the distributions in the population. However, it is noteworthy that, after applying the survey weights, women of White Other and Black African ethnicity are slightly over-represented in our survey whereas women of Indian, Pakistani and Bangladeshi ethnicity are slightly under-represented.

Childbirth experience outcomes

The majority of women reported positive experiences of childbirth and satisfaction with their care; the median birth satisfaction score on the BSS-RI was 8 (out of 12), IQR=6-10. However, 8.3% (95%CI=7.4 - 9.3) of women perceived poorer care from staff during labour and birth (score of ≤5 across the five aspects of staff behaviour), 28.3% (95%CI=26.9 - 29.9) of women experienced childbirth as worse than they had expected, and 9.1% (95%CI=8.2 - 10.1) of women reported being dissatisfied with their overall care during labour and birth. Figure 1–Figure 4 show the childbirth experience outcomes for women according to age group, registration status, ethnic group, country of birth and recency of migration, IMD quintile, and age at completion of full-time education. There is some variation in the outcomes according to the factors explored, particularly for the different ethnic groups, although there is a large amount of overlap in the confidence intervals.

Table 2 and Table 3 show the unadjusted relative risk (uRR) for the association between the sociodemographic factors and each of the composite (Table 2) and single (Table 3) childbirth experience outcomes. Table 2 and Table 3 also show the adjusted relative risk (aRR) with 95% CIs for the association between the sociodemographic factors and each of the childbirth experience outcomes after mutually adjusting for all other sociodemographic characteristics (model 1) and with further adjustment for birth-related factors (model 2). The uRR and aRR for the association between the birth-related factors and the childbirth experience outcomes are also shown.

Perceived care from staff during labour and birth

After mutually adjusting for all sociodemographic factors, there was evidence of association between registration status and ethnicity and perceived care from staff during labour and birth (Table 2, model 1). The associations remained after further adjusting for the birth-related factors (Table 2, model 2). Women who were not living with their baby's other parent (aRR=1.99, 95%CI=1.30 - 3.04) were more likely to report poorer care from staff, compared to married women. Women of Pakistani ethnicity (aRR=2.09, 95%CI=1.74 - 3.16) were also more likely to report poorer care from staff than women of White British ethnicity.

Two of the birth-related factors were associated with perceived care from staff during labour and birth. Women who had an unplanned caesarean section (aRR=1.83, 95%CI=1.34 - 2.49) were more likely to report poorer care from staff, compared to women who gave birth vaginally, whereas women who had a multiple birth (aRR=0.21, 95%CI=0.06 - 0.74) were less likely to report poorer care from staff, compared to women who had a single birth.

Birth Satisfaction (BSS-RI)

After mutually adjusting for all sociodemographic factors, there was evidence of association between ethnicity, socioeconomic deprivation, and education and birth satisfaction on the BSS-RI (Table 2, model 1). The associations between ethnicity and socioeconomic deprivation and birth satisfaction remained after further adjusting for the birth-related factors (Table 2, model 2). Women of Pakistani (aRR=1.54, 95%CI=1.25 - 1.91), Bangladeshi (aRR=1.61, 95%CI=1.19 - 2.17) and Black African (aRR=1.41, 95%CI=1.08 - 1.85) ethnicity were more likely to report lower birth satisfaction, compared to women of White British ethnicity. Women who lived in less socioeconomically advantaged areas (within the second

Table 1. Sociodemographic characteristics of women who responded to the 2020 survey.

Sociodemographic characteristics		N=4611		Population^
		n	%	%
Age	<20 years	44	2.7	2.4
	20–24 years	355	12.5	12.5
	25–29 years	1117	26.5	26.9
	30–34 years	1785	33.7	34.0
	35–39 years	1089	20.0	19.7
	40+ years	221	4.5	4.5
	Missing	*0*	*0*	*0*
Registration status	Married	2886	51.7	52.9
	Joint registration, same address	1392	32.7	32.3
	Joint registration, different address	220	10.5	9.7
	Sole registration	113	5.2	5.1
	Missing	*0*	*0*	*0*
Ethnicity	White British	3465	66.3	65.5
	White Other	416	12.5	10.2
	Indian	143	3.1	3.9
	Pakistani	101	2.9	3.4
	Bangladeshi	41	1.2	1.5
	Black African	101	4.5	3.5
	Black Caribbean	22	0.7	1.2
	Mixed / Multiple / Other	259	7.1	10.7
	Missing	*63*	1.7	NA
Country of birth	UK	3650	70.1	69.6
	Outside UK:	893	29.9	30.4
Recency of migration	Arrival in UK before 2017	711	23.1	NA
	Arrival in UK in 2017 or later	182	6.8	NA
	Missing	*68*	*1.7*	*0*
Socioeconomic deprivation (IMD)	1 (least advantaged)	698	25.6	25.1
	2	876	21.9	22.2
	3	957	19.3	19.4
	4	1070	17.9	17.8
	5 (most advantaged)	1010	15.4	15.5
	Missing	*0*	*0*	*0*
Education	Left full-time education aged 16 years or younger	514	13.9	NA
	Left full-time education aged 17 or 18 years	1226	28.4	NA
	Left full-time education aged 19 years or older	2823	57.7	NA
	Missing	*48*	*1.5*	NA

N unweighted, % weighted

^ based on overall ONS sample (N=16,050) or on 2021 census (women aged 15–49 years)

* cannot report due to small numbers

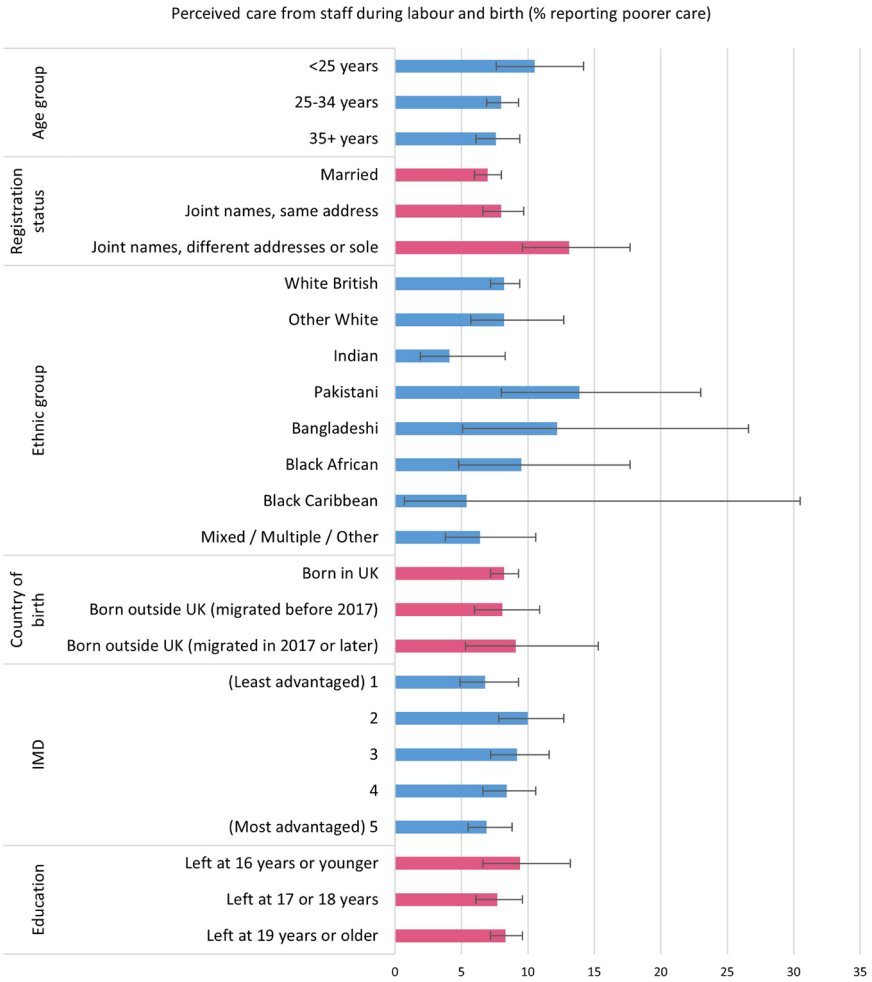

Figure 1. Perceived care during labour and birth for women with different sociodemographic characteristics.

least advantaged quintile on the IMD) (aRR=1.14, 95%CI=1.02 - 1.28) were more likely to report lower birth satisfaction, compared to women who lived in the most socioeconomically advantaged areas. The association between education and birth satisfaction was not statistically significant after adjusting for the birth-related factors.

Three of the birth-related factors were associated with birth satisfaction. Women who had an instrumental birth (aRR=1.78, 95%CI=1.60 - 1.99) or unplanned caesarean section (aRR=2.03, 95%CI=1.84 - 2.24) were more likely to report lower birth satisfaction, compared to women who gave birth vaginally, as were women who gave birth to a pre-term baby (aRR=1.23, 95%CI=1.07 - 1.42), compared to women who gave birth at full-term.

Birth experience compared to expectations

There was evidence of association between ethnicity and country of birth/recency of migration and how women experienced the birth compared to their expectations (Table 3). Women of Indian ethnicity (aRR=0.70, 95%CI=0.49 - 1.00) and women who migrated to the UK in 2017 or later (aRR=0.66, 95%CI=0.45 - 0.98) were less likely to report that the birth was worse than they had expected, compared to women of White British ethnicity and women born in the UK, respectively and this association was statistically significant in the fully adjusted model 2.

Two of the birth-related factors were associated with how women experienced the birth compared to their expectations. Primiparous women (aRR=1.28, 95%CI=1.13 - 1.44) were more likely than multiparous women to report that the birth was worse than they had expected, as were women who had an instrumental birth (aRR=2.77, 95%CI=2.41 - 3.18) or an unplanned caesarean section (aRR=3.88, 95%CI=3.43 - 4.38), compared to women who had a vaginal birth.

Overall satisfaction with care during labour and birth

After mutually adjusting for all sociodemographic factors, there was evidence of association between ethnicity and education and overall satisfaction with care during labour and birth (Table 3, model 1). The associations remained after further

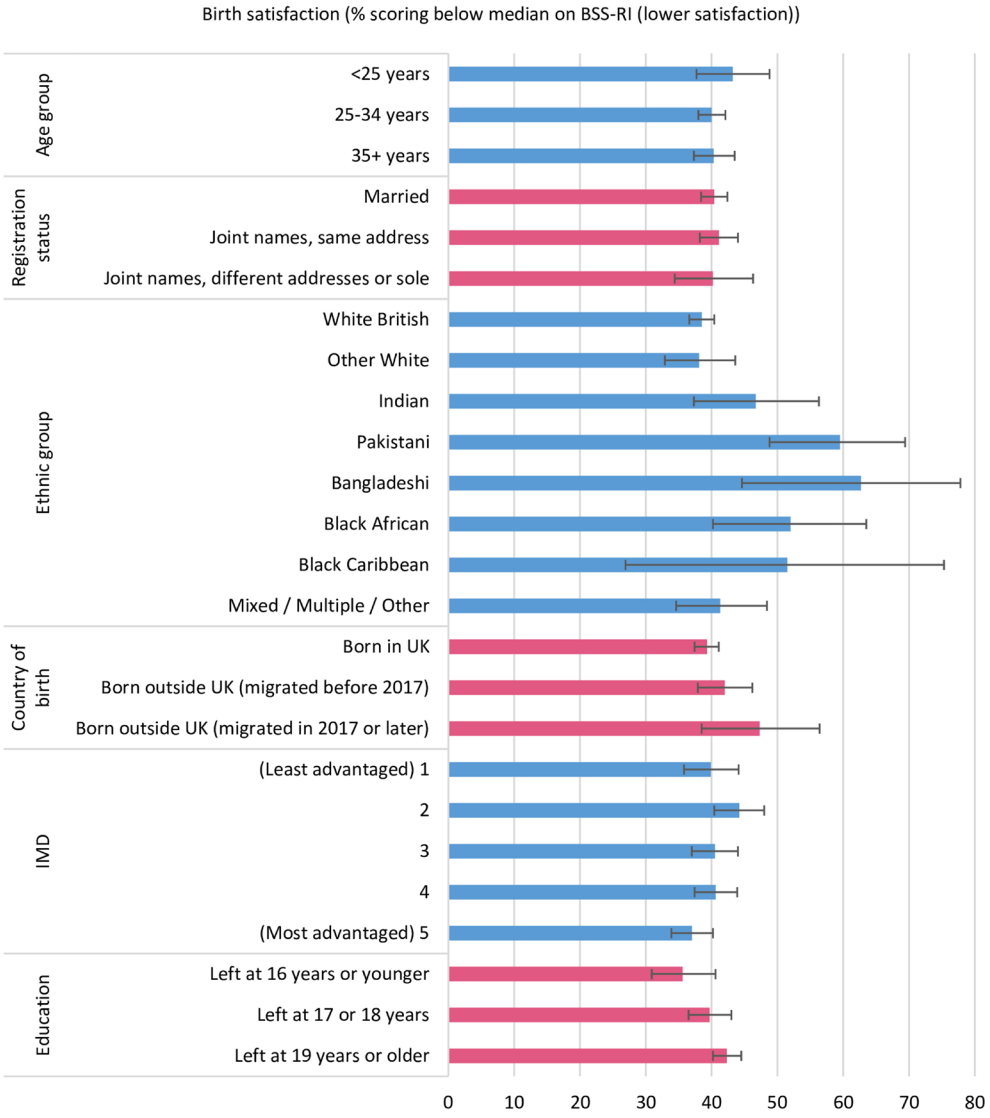

Figure 2. Birth satisfaction on the BSS-RI for women with different sociodemographic characteristics.

adjusting for the birth-related factors (Table 3, model 2). Women of Pakistani (aRR=1.83, 95%CI=1.04 - 3.20) and Bangladeshi (aRR=2.74, 95%CI=1.29 - 5.83) ethnicity were more likely to report overall dissatisfaction with care compared to women of White British ethnicity. Women who completed their education earlier (aged 17 or 18 years) (aRR=0.74, 95%CI=0.57 - 0.98) were less likely to report overall dissatisfaction with care, compared to women who completed their education aged 19 year or older. There was also evidence of association between registration status and overall satisfaction with care during labour and birth. Women who were not living with their baby's other parent (aRR=1.52, 95%CI=1.00 - 2.33) were more likely to report overall dissatisfaction with care, compared to married women, and this association was statistically significant in the fully adjusted model 2.

Two of the birth-related factors were associated with overall satisfaction with care during labour and birth. Primiparous women (aRR=1.40, 95%CI=1.08 - 1.82) and women who had an instrumental birth (aRR=1.42, 95%CI=1.05 - 1.91) or an unplanned caesarean section (aRR=2.10, 95%CI=1.58 - 2.79) were more likely to report overall dissatisfaction with care, compared to multiparous women and women who had a vaginal birth, respectively.

Discussion

Key findings

The current study found that the majority of women reported positive experiences of childbirth and satisfaction with their maternity care; only 9% of women were dissatisfied with their overall care. For a significant minority of women, however,

Figure 3. Birth experience compared to expectations for women with different sociodemographic characteristics.

childbirth experiences were unsatisfactory. We found that certain sociodemographic characteristics may contribute to women's overall experiences of childbirth. After adjusting for key birth-related factors, women of Pakistani and Bangladeshi ethnicity reported significantly poorer childbirth experiences and lower satisfaction with their care compared with women of White British ethnicity. Women of Bangladeshi origin were more than twice as likely (aRR=2.74) as women of White British ethnicity to be dissatisfied with their overall care during labour and birth, and women of Pakistani origin were twice as likely (aRR=2.09) to report poorer perceived care from staff. We also found that women of Black African ethnicity were more likely to report lower birth satisfaction, compared to women of White British ethnicity, although the findings for Black African women were inconsistent across the childbirth experience outcomes. Finally, women of Indian ethnicity tended to report more positive childbirth experiences, compared to women of White British ethnicity, but the differences did not reach statistical significance for the majority of outcomes.

The findings also show that women who were not cohabiting with their baby's other parent reported significantly poorer

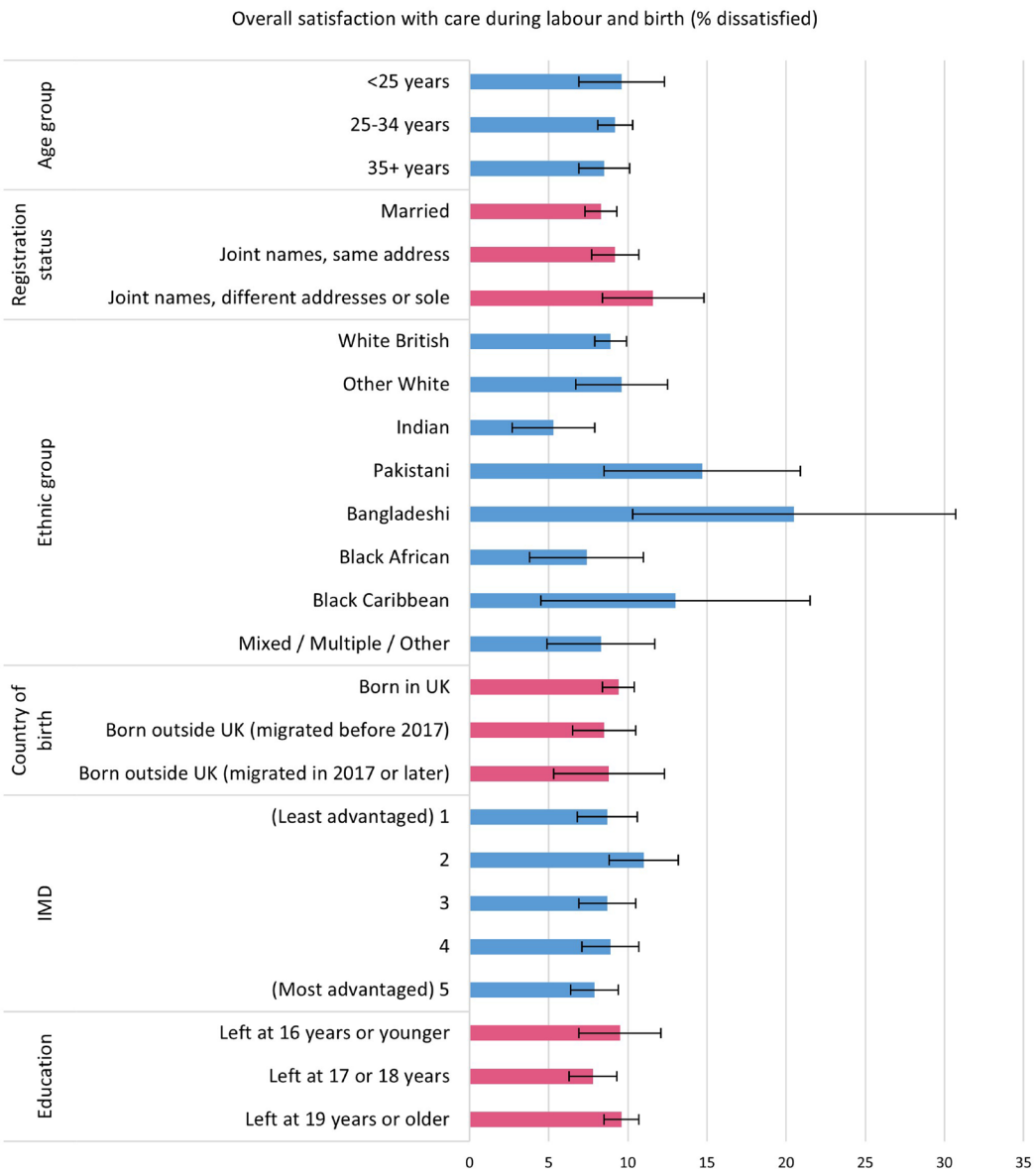

Figure 4. Satisfaction with care during labour and birth for women with different sociodemographic characteristics.

perceived care from staff and lower overall satisfaction with their care during labour and birth. There was no consistent evidence of association (across at least two outcomes) between maternal age, country of birth/recency of migration, socioeconomic deprivation, or education and the childbirth experience outcomes.

In the current study, after mutually adjusting the results for all sociodemographic factors, the analysis was further adjusted for parity, type and mode of birth, and gestational age at birth as these factors are known to impact experiences of childbirth. Associations between these birth-related factors and childbirth experiences show that first-time mothers and women who had an instrumental birth or unplanned caesarean section reported consistently poorer childbirth experiences and lower satisfaction with their care. Women who had an unplanned caesarean section were almost four times more likely (aRR=3.88) to report that their childbirth experience was worse than expected and twice as likely (aRR=2.10) to be dissatisfied with their overall care during labour and birth, compared with women who had a vaginal birth. There was no consistent evidence (across at least two outcomes) to suggest that women who gave birth to a pre-term baby were more likely to report poorer childbirth experiences.

The current findings suggest that, along with certain sociodemographic characteristics, factors relating specifically to the birth are important contributors to women's childbirth experiences.

Table 2. Association between sociodemographic factors and composite childbirth experience outcomes.

	Poorer perceived care from staff during labour and birth						Lower birth satisfaction (score below median on BSS-RI)					
				Model 1		Model 2				Model 1		Model 2
	%	uRR	aRR	95%CI	aRR	95%CI	%	uRR	aRR	95%CI	aRR	95%CI
Sociodemographic factors												
Age group												
<25 years	10.5	1.31	1.13	(0.75 - 1.69)	0.97	(0.65 - 1.45)	43.2	1.08	1.14	(0.99 - 1.32)	1.07	(0.93 - 1.24)
25–34 years	8.0	1	1		1		40.0	1	1		1	
35+ years	7.6	0.95	0.94	(0.72 - 1.23)	0.96	(0.72 - 1.27)	40.3	1.01	0.98	(0.89 - 1.08)	1.01	(0.92 - 1.12)
Registration status												
Married	7.0	1	1		1		40.4	1	1		1	
Joint (same address)	8.0	1.15	1.21	(0.94 - 1.56)	1.12	(0.87 - 1.44)	41.1	1.02	1.09	(1.00 - 1.20)	1.03	(0.95 - 1.13)
Joint (different addresses) or sole	13.1	**1.88**	**1.97**	**(1.28 - 3.03)**	**1.99**	**(1.30 - 3.04)**	40.2	1.00	1.03	(0.87 - 1.22)	1.01	(0.85 - 1.20)
Ethnic group												
White British	8.2	1	1		1		38.5	1	0.97		1	
Other White	8.2	1.05	1.40	(0.75 - 2.61)	1.29	(0.69 - 2.43)	38.1	0.99	0.97	(0.78 - 1.21)	1.00	(0.81 - 1.22)
Indian	4.1	**0.50**	0.67	(0.30 - 1.52)	0.72	(0.32 - 1.58)	46.7	**1.21**	1.21	(0.96 - 1.51)	1.08	(0.86 - 1.36)
Pakistani	13.9	**1.69**	**2.29**	**(1.27 - 4.11)**	**2.09**	**(1.16 - 3.74)**	59.5	**1.54**	**1.49**	**(1.20 - 1.86)**	**1.54**	**(1.25 - 1.91)**
Bangladeshi	12.2	1.49	2.26	(0.93 - 5.47)	2.23	(0.93 - 5.33)	62.7	**1.63**	**1.65**	**(1.22 - 2.24)**	**1.61**	**(1.19 - 2.17)**
Black African	9.5	1.15	1.44	(0.64 - 3.22)	1.48	(0.68 - 3.25)	52.0	**1.35**	**1.36**	**(1.02 - 1.80)**	**1.41**	**(1.08 - 1.85)**
Black Caribbean	5.4	0.66	0.67	(0.10 - 4.30)	0.63	(0.91 - 4.39)	51.5	1.34	1.39	(0.85 - 2.29)	1.38	(0.75 - 2.56)
Mixed / Multiple / Other	6.4	0.78	0.95	(0.49 - 1.86)	0.91	(0.45 - 1.84)	41.3	1.07	1.03	(0.84 - 1.27)	1.01	(0.82 - 1.24)
Country of birth / Recency of migration												
Born in UK	8.2	1	1		1		39.3	1	1		1	
Born outside UK (migrated before 2017)	8.1	0.99	0.77	(0.45 - 1.32)	0.75	(0.44 - 1.29)	42.0	1.07	0.99	(0.83 - 1.17)	0.95	(0.81 - 1.12)
Born outside UK (migrated in 2017 or later)	9.1	1.11	0.89	(0.46 - 1.72)	0.84	(0.44 - 1.61)	47.3	**1.20**	1.07	(0.84 - 1.35)	0.91	(0.72 - 1.16)
Socioeconomic deprivation (IMD)												
1 (least advantaged)	6.8	0.98	0.68	(0.45 - 1.05)	0.70	(0.45 - 1.08)	39.9	1.08	1.01	(0.88 - 1.17)	1.02	(0.89 - 1.18)
2	10.0	**1.44**	1.24	(0.88 - 1.73)	1.18	(0.84 - 1.66)	44.2	**1.19**	**1.16**	**(1.03 - 1.32)**	**1.14**	**(1.01 - 1.28)**
3	9.2	**1.33**	1.12	(0.80 - 1.58)	1.11	(0.79 - 1.56)	40.5	1.09	1.05	(0.93 - 1.19)	1.04	(0.93 - 1.18)
4	8.4	1.21	1.17	(0.84 - 1.62)	1.13	(0.81 - 1.58)	40.6	1.10	1.09	(0.96 - 1.22)	1.08	(0.96 - 1.21)
5 (most advantaged)	6.9	1	1		1		37.0	1	1		1	
Education												
Left at 16 years or younger	9.4	1.12	0.95	(0.64 - 1.41)	1.06	(0.72 - 1.58)	35.6	**0.84**	**0.81**	**(0.70 - 0.95)**	0.89	(0.76 - 1.04)
Left at 17 or 18 years	7.7	0.92	0.83	(0.62 - 1.12)	0.83	(0.62 - 1.12)	39.7	0.94	0.90	(0.81 - 1.00)	0.94	(0.85 - 1.04)
Left at 19 years or older	8.3	1	1		1		42.3	1	1		1	

	Poorer perceived care from staff during labour and birth						Lower birth satisfaction (score below median on BSS-RI)					
				Model 1		Model 2				Model 1		Model 2
	%	uRR	aRR	95%CI	aRR	95%CI	%	uRR	aRR	95%CI	aRR	95%CI
Birth-related factors												
Parity												
Primiparous	10.1	**1.48**	**-**		1.26	(0.96 - 1.66)	47.5	**1.36**	**-**		1.09	(0.99 - 1.20)
Multiparous	6.8	1	-		1		34.9	1	-		1	
Type of birth												
Single	8.3	1	-		1		40.6	1	-		1	
Multiple	4.9	0.59	-		**0.21**	**(0.06 - 0.74)**	41.7	1.03	-		0.98	(0.65 - 1.46)
Mode of birth												
Vaginal	7.0	1	-		1		31.8	1	-		1	
Instrumental	7.8	1.10	**-**		1.05	(0.75 - 1.48)	57.9	**1.82**	**-**		**1.78**	**(1.60 - 1.99)**
Planned Caesarean section	7.7	1.09	-		1.21	(0.85 - 1.72)	34.9	1.10	-		1.09	(0.94 - 1.26)
Unplanned Caesarean section	14.6	**2.07**	**-**		**1.83**	**(1.34 - 2.49)**	67.9	**2.13**	**-**		**2.03**	**(1.84 - 2.24)**
Gestation												
Pre-term	12.1	**1.53**	-		1.36	(0.90 - 2.06)	51.4	**1.30**	-		**1.23**	**(1.07 - 1.42)**
Term	7.9	1	-		1		39.5	1	-		1	

Bold text denotes associations significant at p<0.1 in univariable analysis and significant at p<0.05 in multivariable analysis

Table 3. Association between sociodemographic factors and single childbirth experience outcomes.

	Birth worse than expected						Overall dissatisfaction with care during labour and birth					
				Model 1		Model 2				Model 1		Model 2
	%	uRR	aRR	95%CI	aRR	95%CI	%	uRR	aRR	95%CI	aRR	95%CI
Sociodemographic factors												
Age group												
<25 years	30.6	1.08	1.12	(0.93 - 1.35)	1.03	(0.87 - 1.22)	9.6	1.03	1.04	(0.70 - 1.54)	0.88	(0.59 - 1.30)
25–34 years	28.2	1	1		1		9.2	1	1		1	
35+ years	27.2	0.96	0.93	(0.83 - 1.05)	1.05	(0.94 - 1.18)	8.5	0.91	0.91	(0.72 - 1.16)	0.98	(0.76 - 1.26)
Registration status												
Married	27.7	1	1		1		8.3	1	1		1	
Joint (same address)	29.7	1.07	1.07	(0.95 - 1.20)	0.93	(0.84 - 1.04)	9.2	1.12	1.14	(0.89 - 1.45)	1.03	(0.81 - 1.31)
Joint (different addresses) or sole	27.6	0.99	1.02	(0.83 - 1.27)	1.02	(0.83 - 1.25)	11.6	**1.40**	1.50	(0.98 - 2.30)	**1.52**	**(1.00 - 2.33)**
Ethnic group												
White British	29.5	1	1		1		8.9	1	1		1	
Other White	28.2	0.95	1.04	(0.77 - 1.39)	1.01	(0.77 - 1.33)	9.6	1.07	1.46	(0.84 - 2.55)	1.39	(0.78 - 2.45)
Indian	20.5	**0.69**	0.73	(0.50 - 1.06)	**0.70**	**(0.49 - 1.00)**	5.3	0.59	0.60	(0.27 - 1.32)	0.60	(0.27 - 1.37)

	Birth worse than expected						Overall dissatisfaction with care during labour and birth					
				Model 1		Model 2				Model 1		Model 2
	%	uRR	aRR	95%CI	aRR	95%CI	%	uRR	aRR	95%CI	aRR	95%CI
Pakistani	34.5	1.17	1.21	(0.86 - 1.70)	1.20	(0.90 - 1.61)	14.7	**1.64**	**1.90**	**(1.08 - 3.34)**	**1.83**	**(1.04 - 3.20)**
Bangladeshi	33.3	1.13	1.12	(0.67 - 1.88)	1.13	(0.68 - 1.86)	20.5	**2.30**	**3.23**	**(1.63 - 6.39)**	**2.74**	**(1.29 - 5.83)**
Black African	21.7	0.73	0.88	(0.54 - 1.46)	0.93	(0.57 - 1.53)	7.4	0.83	1.13	(0.50 - 2.59)	1.23	(0.54 - 2.79)
Black Caribbean	38.1	1.29	1.41	(0.65 - 3.06)	1.30	(0.68 - 2.47)	13.0	1.46	1.45	(0.52 - 4.05)	1.47	(0.50 - 4.34)
Mixed / Multiple / Other	21.6	**0.73**	0.76	(0.55 - 1.05)	0.75	(0.55 - 1.02)	8.3	0.93	1.12	(0.60 - 2.10)	1.18	(0.62 - 2.26)
Country of birth / Recency of migration												
Born in UK	29.4	1	1		1		9.4	1	1		1	
Born outside UK (migrated before 2017)	26.2	0.89	0.89	(0.69 - 1.15)	0.85	(0.67 - 1.07)	8.5	0.90	0.66	(0.41 - 1.05)	0.62	(0.39 - 1.01)
Born outside UK (migrated in 2017 or later)	21.9	0.74	0.81	(0.54 - 1.21)	**0.66**	**(0.45 - 0.98)**	8.8	0.93	0.73	(0.39 - 1.38)	0.64	(0.33 - 1.22)
Socioeconomic deprivation (IMD)												
1 (least advantaged)	26.2	0.96	0.98	(0.81 - 1.17)	1.00	(0.85 - 1.18)	8.7	1.09	0.97	(0.67 - 1.40)	0.96	(0.66 - 1.38)
2	29.9	1.10	1.15	(0.98 - 1.34)	1.12	(0.98 - 1.29)	11.0	**1.39**	1.34	(0.99 - 1.82)	1.27	(0.94 - 1.72)
3	27.6	1.01	1.03	(0.88 - 1.20)	1.00	(0.86 - 1.15)	8.7	1.10	1.03	(0.75 - 1.42)	0.97	(0.70 - 1.33)
4	31.1	**1.14**	1.13	(0.98 - 1.31)	1.11	(0.97 - 1.26)	8.9	1.12	1.05	(0.77 - 1.44)	1.02	(0.75 - 1.39)
5 (most advantaged)	27.3	1	1		1		7.9	1	1		1	
Education												
Left at 16 years or younger	24.5	**0.83**	0.76	(0.63 - 0.92)	0.96	(0.80 - 1.15)	9.5	0.99	0.87	(0.60 - 1.26)	1.03	(0.71 - 1.51)
Left at 17 or 18 years	28.6	0.97	0.90	(0.79 - 1.03)	0.97	(0.86 - 1.09)	7.8	0.81	**0.72**	**(0.55 - 0.95)**	**0.74**	**(0.57 - 0.98)**
Left at 19 years or older	29.3	1	1		1		9.6	1	1		1	
Birth-related factors												
Parity												
Primiparous	38.6	1.95	**-**		**1.28**	**(1.13 - 1.44)**	11.6	**1.63**	**-**		1.40	**(1.08 - 1.82)**
Multiparous	19.8	1	-		1		7.1	1	-		1	
Type of birth												
Single	28.5	1	-		1		9.1	1	-		1	
Multiple	17.4	0.61	-		0.76	(0.45 - 1.30)	4.8	0.52	-		0.49	(0.17 - 1.35)
Mode of birth												
Vaginal	17.1	1	-		1		7.2	1	-		1	
Instrumental	50.9	2.98	-		**2.77**	**(2.41 - 3.18)**	11.1	**1.53**	**-**		**1.42**	**(1.05 - 1.91)**
Planned Caesarean section	15.4	0.90	-		0.96	(0.77 - 1.20)	7.0	0.97	-		1.02	(0.73 - 1.43)
Unplanned Caesarean section	69.3	4.06	**-**		**3.88**	**(3.43 - 4.38)**	17.5	**2.42**	**-**		**2.10**	**(1.58 - 2.79)**
Gestation												
Pre-term	32.4	1.16	-		1.07	(0.88 - 1.30)	8.8	**1.41**	-		1.27	(0.83 - 1.96)
Term	28.0	1	-		1		12.5	1	-		1	

Bold text denotes associations significant at p<0.1 in univariable analysis and significant at p<0.05 in multivariable analysis

Comparison to existing literature

Previous studies have shown that women from minority ethnic backgrounds may be less likely to have positive childbirth experiences. A nationwide maternity survey commissioned by the Care Quality Commission (CQC) in England in 2010 found that women from minority ethnic groups were less likely to feel spoken to in a way they could understand, to be treated with kindness, to be sufficiently involved in decisions, and to have confidence and trust in the staff throughout their maternity care[6]. In a qualitative study of women in England, support, communication and care needs were less likely to be met for women from minority ethnic backgrounds[26]. A more recent survey of over 1,300 women in the UK who identified as Black or Black Mixed ethnicity found that 42% of respondents felt the standard of care they received during childbirth was poor or very poor[27], although there was no comparison of the findings to other ethnic groups. In the current study, a higher proportion of women of Black Caribbean ethnicity reported dissatisfaction with their overall care, compared to women of White British ethnicity (13% versus 9%, aRR=1.47), but the difference was not statistically significant, perhaps due to the relatively small number of women of Black Caribbean ethnicity in the study.

Our results are broadly in line with these previous findings, suggesting that ethnic inequalities in maternity care experiences persist, and with women from Pakistani and Bangladeshi backgrounds reporting particularly poor experiences. It is notable, however, that more recent maternity surveys by the CQC in England have not shown poorer maternity care experiences for minority ethnic groups[28], although outcomes are analysed by broader ethnic categories which may mask differences, such as those found for Indian, Pakistani and Bangladeshi women in the current study.

The evidence for the effect of socioeconomic factors on childbirth experience is mixed. An analysis based on data from the national maternity survey in England in 2010 found that, with decreasing socio-economic position, women were more likely to report that they were not treated respectfully or spoken to in a way they could understand by doctors and midwives[29]. A survey in the United States also found that women with social, economic or health challenges experienced mistreatment during birth more frequently[30]. In contrast, the most recent CQC maternity survey in England did not report variation in maternity care experiences for women with different levels of socioeconomic deprivation[28]. Similarly, evidence from the current study on the association between socioeconomic deprivation and childbirth experiences is inconsistent.

The relationship status of parents, including whether the baby is registered in both parents' names and whether parents are co-habiting or separated, seems to influence childbirth experiences. A large Norwegian study found that the odds of a negative childbirth experience increased for women who were not married or cohabiting[8]. This is consistent with our current study which found that women who were not co-habiting or who were sole parents had poorer childbirth experiences. We found no clear evidence of association between maternal age, education, country of birth or recency of migration and childbirth experience in the current study, which is contrary to some previous studies[6]. A systematic review of factors affecting childbirth experiences, for instance, found that age and parity were important[31], yet a recent study of Brazilian women found no association between sociodemographic factors and level of satisfaction with the childbirth experience[32].

The existing literature suggests that there is a complex array of factors that intersect to determine women's childbirth experiences and diverse dimensions of satisfaction[33]. As well as sociodemographic characteristics, several other factors have been shown to influence experiences of care. Factors relating to antenatal care, the physical birthing environment, and breastfeeding initiation have been found to be important[32], as well as obstetric factors such as unexpected medical problems, low Apgar score, and transfer of the baby to intensive care[34–36]. A recent review identified psychosocial factors including fear, self-efficacy, control, expectations, preparation, and support as being associated with childbirth experience[30]. Additional factors identified include respect, privacy, inclusion in decision-making, feeling safe and nurtured, and fulfilment of personal and sociocultural expectations of childbirth[10,37].

Strengths and limitations

To our knowledge, this is one of the first studies to explore inequalities in childbirth experiences for women who gave birth in England during the pandemic. The findings are based on a large population-based sample and survey weights were employed to mitigate the effects of non-response bias and to increase the representativeness and generalisability of the findings. The survey weights only accounted for key sociodemographic factors, however, and therefore do not eliminate all sources of non-response bias from the findings. The size of the study allowed more detailed analysis of ethnic groups, rather than collapsing smaller groups into the broader categories that tend to be reported in other studies (Asian, Black, Mixed, White, and Other). Such broad merged categories can mask important differences in outcomes and experiences, such as the poorer experiences reported by Pakistani and Bangladeshi women and better experiences reported by Indian women in our study. However, using narrower sociodemographic subcategories with smaller numbers of women in each group led to wider confidence intervals around some effect size estimates. When exploring inequalities in childbirth experiences, previous studies have tended to focus primarily on ethnicity and/or socioeconomic deprivation, without considering other important factors. The current study includes multiple sociodemographic and birth-related factors and explores the interaction between these to provide further insight into the key determinants of childbirth experiences. However, we were unable to fully explore the intersection between ethnicity and socioeconomic deprivation or ethnicity and country of birth because the numbers of women in some of the groups were too small.

Implications

It is important to highlight that the majority of women who took part in the current study reported positive experiences of childbirth and satisfaction with their care. Yet, there is a clear finding that a significant minority of women have poor experiences and our findings provide evidence for sociodemographic and birth-related factors in determining differences in childbirth

experiences. Women from minority ethnic backgrounds who are first-time mothers and have an instrumental delivery or unplanned caesarean section may be particularly vulnerable to poorer childbirth experiences. A recent qualitative synthesis highlighted that minority ethnic women report positive birth experiences when they are in receipt of kind, respectful and woman-centred midwifery care, but that this tends to be the exception[38]. Therefore, in clinical practice, greater attention to basic principles of care, such as kindness and respect during labour and birth could provide more positive childbirth experiences for all women[32]. For women from minority ethnic backgrounds, healthcare providers should receive training in cultural sensitivity and implicit bias mitigation to ensure equitable and satisfying birth experiences for women from all backgrounds[39].

Women and families should expect basic care principles to be met and must be empowered to advocate for better birthing experiences. It is notable that over a quarter of all women in the current study indicated that their experience of childbirth was worse than they had expected, which suggests a key role for education and preparation during pregnancy so that women are equipped with realistic expectations about childbirth. The role of expectations is important in how childbirth is experienced and there is evidence suggesting multicultural differences in expectations for childbirth[40], which in turn can impact experience and satisfaction.

The Covid-19 pandemic caused disruption to maternity services and the restrictive measures taken had the capacity to obstruct provision of optimal maternity care around childbirth[41]. Comparing the findings in the current study with findings from previous national maternity surveys in England suggests that childbirth experiences were generally worse in 2020 than before the pandemic[18]. A qualitative study exploring the maternity care experiences of minority ethnic women who gave birth during the pandemic found that the systemic inadequacies in maternity care provision which have been identified for minority ethnic women were exacerbated by the health service modifications resulting from the pandemic[9]. It is therefore important that policy makers and health professionals are aware of the heightened risk to women from ethnic minority backgrounds during future pandemics or other times of crisis.

Conclusions

The majority of women who took part in the current study reported positive experiences of childbirth and satisfaction with their care. Yet, a significant minority of women reported childbirth experiences that were unsatisfactory. Our findings provide evidence for sociodemographic and birth-related factors in determining differences in childbirth experiences. Understanding inequalities can help to inform interventions and policies to deliver better care during childbirth and ensure positive experiences for all women regardless of their sociodemographic differences.

Declarations

Ethics approval and consent to participate

The survey was approved by the North West - Greater Manchester East NRES Committee on 22nd October 2020 (REC reference: 20/NW/0426). The NRES Committee approved the study without the requirement for informed consent. Return of partially or fully completed questionnaires was considered to imply agreement to participate in the study and consent to use the data. The participant information sheet explained that participation was voluntary and potential participants could contact the study helpline on a free telephone number should they wish to discuss any aspect of the study in more detail before deciding whether to take part.

Availability of data and materials

The data underlying this study are not publicly available because the scope of the consent obtained from study participants restricts our ability to share the data on ethical and legal grounds. There are also third-party restrictions by the Office for National Statistics (ONS). Requests to access birth registration data can be submitted to the ONS at: https://www.ons.gov.uk/aboutus/whatwedo/statistics/requestingstatistics/makingarequest; information about the ONS data sharing policy can be found at: https://cy.ons.gov.uk/aboutus/transparencyandgovernance/datastrategy/datapolicies/onsresearchanddataaccesspolicy. Requests to access data from the 2020 national maternity survey can be submitted to the Director of the NPEU at general@npeu.ox.ac.uk. All requests would be subject to the National Perinatal Epidemiology Unit Data Access Policy and may require further regulatory approvals.

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Open Peer Review

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Enos Moyo
University of KwaZulu-Natal, Durban, South Africa

Thank you for the opportunity to review the manuscript. The topic is relevant and of interest to policymakers and healthcare providers. The title reflects the content of the manuscript. The abstract is a correct summary of the manuscript. The introduction orients the readers to the topic, and the authors state the objective of the study. The methods section is well-described to allow for the replication of the study. The study setting and the period of data collection are stated. All the outcome variables and the predictors are described. Data analysis is clearly described. However, the sample size determination was not properly explained. The results are presented well with the help of figures and tables. However, the response rate was not stated. The authors compared their findings with previous literature in the discussion. However, no possible explanations were offered for the findings. The conclusions are based on the study's findings. The references used in the manuscript are relatively recent, and the references in the reference list are correctly formatted.

MAJOR REVISIONS
Abstract
1. In the results section, the authors state, 'The majority of women reported positive childbirth experiences and satisfaction with their maternity care. For a significant minority of women, however, childbirth experiences were unsatisfactory.' The authors must provide percentages for 'the majority' and 'a significant minority.'
Methods
2. The authors must clearly state how they calculated the sample size and the parameters that were used.
Results
3. The authors must state the response rate at the beginning of this section.
Discussion
4. Apart from comparing their findings with previous literature, the authors must provide possible explanations for their findings.

MINOR REVISIONS

1. Under keywords, ‘surveys and questionnaires’ should just be ‘survey.’
2. In the second paragraph of the introduction, the authors state, ‘The World Health Organization (WHO) recommends the same standard of maternity care for all women (WHO, 2018) and emphasises the importance of having a positive childbirth experience for the short- and longer-term health and wellbeing of women and their families[4,5].’ Remove (WHO, 2018) since I assume it's included in the references at the end of the sentence.
3. Under design and participants, the authors state, ‘A random sample of 16,050 women was identified by the Office for National Statistics (ONS) from birth registration records.’ Was this the total population or the sample size, because only 4,611 participants were described under results?

Is the work clearly and accurately presented and does it cite the current literature?
Yes

Is the study design appropriate and is the work technically sound?
Yes

Are sufficient details of methods and analysis provided to allow replication by others?
Partly

If applicable, is the statistical analysis and its interpretation appropriate?
Yes

Are all the source data underlying the results available to ensure full reproducibility?
Yes

Are the conclusions drawn adequately supported by the results?
Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Public Health Medicine

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.