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Complete List of Authors:	Henderson, Jane; NPEU, Nuffield Department of Population Health Redshaw, Maggie; NPEU, Department of Population Health
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Women's experience of early labour care: a mixed methods study

Jane Henderson BSc(Hons) MSc PhD*

Maggie Redshaw BA PhD CPsychol

Policy Research Unit in Maternal Health and Care,

National Perinatal Epidemiology Unit,

Nuffield Department of Population Health,

University of Oxford,

Old Road Campus,

Old Road,

Oxford, UK

* Corresponding author

Tel: 01865 289758; Fax: 01865 289701

Email: jane.henderson@npeu.ox.ac.uk

Email: maggie.redshaw@npeu.ox.ac.uk

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Abstract

Objectives: To explore women's experiences of early labour care focussing on differences between sociodemographic groups, and to examine the effect of antenatal education on women's experience of early labour.

Setting: England, 2014.

Participants: Women who completed postal questionnaires asking about their experience of maternity care including questions about antenatal education, early labour and sociodemographic factors.

Primary and secondary outcome measures: Worries about labour, contact with midwives in early labour and subsequent care. Free-text comments.

Results: Completed questionnaires were received from 4571 women. There were significant differences by sociodemographic factors, particularly ethnicity, in women's worries about early labour. Compared to White women, women from Black or minority ethnic groups had an adjusted Odds ratio of 1.61 (95% confidence interval 1.60, 2.28) of feeling worried about not knowing when labour would start. Among women who contacted a midwife at the start of labour, 84% perceived their advice as appropriate, more in older and multiparous women. Overall, 60% of women were asked to come in to hospital at this time, more in multiparous women (adjusted Odds ratio 1.47, 95% confidence interval 1.24, 1.75). Being denied antenatal education was associated with greater worry about early labour. Five themes emerged from the qualitative analysis. These were: '*Assumptions about identifying active labour*', '*Staff attitudes*', '*Not being allowed…*', '*Previous labours*', and '*The consequences for women*'.

Conclusions: These findings reinforce the importance of providing reassurance to women in early labour, taking care that women do not feel neglected or dismissed. In particular, young primiparous

women and those from minority ethnic groups reported greater worry about aspects of early labour than other women and require additional reassurance.

Article summary

Strengths and limitations of the study

- Large study based on random sample of birth registrations in England.
- Both quantitative and qualitative data from women relating to early labour.
- Response rate of 47% makes generalisation difficult.
- Respondents, especially those who wrote free-text comments, predominantly primiparous, educated, and resident in less deprived areas.

INTRODUCTION

Early labour, also known as the latent phase, has been defined in a number of different ways but the National Institute for Health and Clinical Excellence (NICE) defines it as a period of time when there are painful contractions and some cervical change.(1) Early labour is usually a slow process during which women may feel distress and anxiety, and lose confidence in their ability to cope.(2) The resulting stress hormones may counter the effects of oxytocin and slow the progress of labour(3) resulting in further anxiety and distress.

Many studies have demonstrated that admission to hospital prior to active labour increases the risk of oxytocin augmentation, epidural analgesia and caesarean section.(4-9) Health professionals therefore strongly recommend to women that they stay home as long as possible, until contractions are as frequent as three in ten minutes. This cut-off is based on a graphic approach developed by Friedman in the 1950s.(10) However, for women, the negative effects of staying at home in pain include confusion, anger and resentment, feeling neglected, unsupported and anxious.(2) It has been estimated that between 30% and 45% of women are admitted to hospital prior to active labour.(11, 12)

A randomised trial of an intervention providing additional support to women at home during early labour resulted in more admissions in active labour, reduced use of analgesia, reduced neonatal morbidity, and increased maternal satisfaction although emotional wellbeing and distress did not differ between the groups.(12) Other studies have found no significant benefit associated with structured care involving one-to-one care, positioning techniques, and positive imagery in early labour,(13) or use of an algorithm for defining active labour based on presence of painful, regular, moderate or strong contractions and either cervical effacement and dilation of at least 3cm, spontaneous rupture of membranes, or a 'show'.(14)

Several studies have used qualitative techniques to examine women's views and experience of care in early labour.(15-18) The findings of these studies reflect women's uncertainty and anxiety about

presenting at hospital at the right time, worry about being sent home if they arrive too early, their need for validation, the pressure as well as support provided by friends and family, surprise regarding the intensity of pain in early labour, and fatigue resulting in reduced ability to cope. Other qualitative studies have examined the care of women in early labour from the midwives' perspective.(19, 20) These stress the importance of providing reassurance to the woman and her family and normalising the situation. However, they differed in overall paradigm which may reflect differences in the organisation of care in Norway and the UK. The Norwegian study(19) acknowledged that some women labour quickly and clinical judgement on the phone is necessarily limited. These midwives believed that it was best for women to come to hospital for assessment if they wished and then to feel sufficiently informed and empowered to make the decision to return home if they were not in active labour. In contrast, the midwives in the UK study(20) stressed the importance of the midwives' role as 'gatekeeper' acknowledging that they had different priorities from the women. They reported that they could tell from a woman's voice, or through intuition, whether she was in active labour. Moreover, some midwives used trivialising language to describe women in early labour such as 'frequent flyers'. They acknowledged that although labour ward workload should not take precedence over women's experience, it often did.(20)

Only one study used quantitative techniques to explore women's experience of early labour.(17) They reported that 46% of women were aware of the expectation that they would stay at home during early labour, and that being made to feel unwelcome, not being treated with respect or as an individual were associated with feeling dissatisfied with care in early labour. This was exacerbated if they were sent home more than once without follow-up arrangements being made, or felt discouraged from returning, especially if they felt that this was due to the unit being busy rather than it being clinically appropriate.

No studies have examined the early labour experiences of women from different sociodemographic groups although evidence from other studies suggests that women from more disadvantaged groups

have poorer experience of maternity care.(21-24) The aim of this study was therefore to explore the experiences of early labour care among women with different sociodemographic characteristics. It was also hypothesised that women who attended antenatal education would be less worried about early labour and less likely to go to hospital early.

METHODS

This study involved secondary analysis of a national maternity survey carried out in England in 2014.(25) Women were randomly selected from birth registration statistics by staff at the Office for National Statistics (ONS) excluding those aged less than 16 years and those whose baby had died. The questionnaire, together with a letter, information leaflet and sheet in 18 non-English languages encouraged women to complete the questionnaire (by phone with the help of an interpreter if necessary) and return it in a Freepost envelope. The questionnaire could also be completed online. Using a tailored reminder system up to three reminders were sent as required.

Women were asked about their experience of maternity care including early labour, and also asked questions about sociodemographic characteristics and whether they attended antenatal classes. Using a validated worries checklist they were asked a range of questions, including if, before labour started, they were worried about not knowing when they would go into labour, and about getting to the hospital in time (answer options: very, quite, not very, not at all worried).(26) Women who had a labour were asked if they contacted a midwife or the hospital at the very start of their labour, and if so, whether they felt that they were given appropriate advice and support. If they had contacted a midwife or the hospital, they were asked about the response, that is, whether they were asked to come into the hospital, stay at home, wait and phone again, or phone again if worried.

There was space for free-text comment at the point in the questionnaire relating to early labour and at the end. Women were also asked what they would like to tell other women about having a baby in that hospital or unit.

ONS provided information about each woman's age group, country of birth, marital status, and an area based measure, the Index of Multiple Deprivation (IMD) in quintiles, which enabled comparison of responders and non-responders.

Women who had a caesarean planned before labour were excluded from the analysis. A descriptive analysis was carried out using raw percentages to establish how groups' experiences differed. As there was likely to be overlap between different sociodemographic factors, binary logistic regression was used to estimate the extent of this, to determine the main drivers for any differences seen, and to test the effect of antenatal education. All quantitative analyses were carried out in Stata version 13.

Free-text responses to the questions relating to care in early labour and at the end of the questionnaire were analysed following the method of Garcia et al (2004).(27) Responses were filtered using the keywords 'early', 'latent', 'sent home', 'come/came back', and 'return' then read and selected if they referred to early labour. Comments were read and coded in an iterative process, coding themes as they arose using a thematic content analytic approach. Deviant cases were sought, and triangulation with quantitative data on satisfaction was used to test the credibility and trustworthiness of the findings.(28)

Ethical approval for the survey was obtained from the NRES committee for Yorkshire and The Humber – Humber Bridge (REC reference 14/YH/0065).

RESULTS

Completed questionnaires were received from 4571 women representing a 47% usable response rate. Compared to non-respondents, women who completed the questionnaire were significantly more likely to be older, married, living in a less deprived area and born in the UK.(25)

Quantitative results

The descriptive statistics shown in Table 1 indicate considerable differences in women's worries about early labour and in their care at this time. Worry about knowing when labour would start was significantly greater in those aged 40 years and older, in primiparous women and in women from Black and minority ethnic (BME) groups. Worry about getting to hospital in time was significantly greater in multiparous women and, again, those from BME groups.

Table 1 – Sociodemographic characteristics of women with worries about early labour

	Worry about knowing when labour would start					**Worry about getting to hospital in time**				
	Very/quite worried		Not very/at all worried			Very/quite worried		Not very/at all worried		
	N	%	N	%		N	%	N	%	
Maternal age (years)										
<20	49	49.5	50	50.5		29	29.0	71	71.0	
20-24	284	54.5	237	45.5		204	39.2	317	60.8	
25-29	581	49.1	603	50.9		445	37.6	739	62.4	
30-34	687	45.4	826	54.6		519	34.3	996	65.7	
35-39	385	46.4	445	53.6		296	36.0	526	64.0	
40+	89	41.2	127	58.8		69	31.7	149	68.3	
Total	2075	47.6	2288	52.4	***	1562	35.8	2798	64.2	
Parity										
Primiparous	1104	51.4	1045	48.6		718	33.5	1427	66.5	
Multiparous	907	43.1	1195	56.9		791	37.7	1308	62.3	
Total	2011	47.3	2240	52.7	**	1509	35.6	2735	64.4	**
Index of multiple deprivation (quintiles)										
1 (least deprived)	399	45.8	473	54.2		305	35.1	565	64.9	
2	388	46.9	440	53.1		292	35.1	539	64.9	
3	427	47.6	470	52.4		317	35.5	576	64.5	
4	465	50.0	465	50.0		345	36.9	589	63.1	
5 (most deprived)	396	47.3	441	52.7		303	36.4	530	63.6	
Total	2075	47.5	2289	52.5		1562	35.8	2799	64.2	
Black or minority ethnic group										
No	1629	45.4	1958	54.6		1237	34.4	2355	65.6	
Yes	393	59.0	273	41.0		288	43.4	375	56.6	
Total	2022	47.5	2231	52.5	***	1525	35.8	2730	64.2	***

** p<0.05 ** p<0.01 *** p<0.001*

Overall, 77% of women who experienced a labour contacted a midwife or the hospital at the start of labour (Table 2). This was significantly more likely in younger women and those from BME groups. Overall, 84% of women reported receiving appropriate advice at this time, with significantly more reporting this among older and multiparous women. Women were more likely to consider the advice appropriate if it included coming into hospital (Figure 1). Overall, two-thirds of women were eventually asked to come in to the hospital to be assessed, but 40% were at some point asked to stay at home and phone again later. This latter was significantly more common in women who were younger, primiparous, and resident in areas of least deprivation (Table 3).

Table 2 – Sociodemographic characteristics of women contacting a health professional at the start of labour

	Contacted a MW/hospital at start of labour					Received appropriate advice?				
	Yes		No			Yes		No		
	N	%	N	%		N	%	N	%	
Maternal age (years)										
<20	68	78.2	19	21.8		50	73.5	18	26.5	
20-24	370	77.7	106	22.3		287	77.6	83	22.4	
25-29	859	79.5	221	20.5		719	83.7	140	16.3	
30-34	994	77.2	293	22.8		854	85.9	140	14.1	
35-39	517	76.4	160	23.6		455	88.0	62	12.0	
40+	95	62.9	56	37.1		86	90.5	9	9.5	
Total	2903	77.2	855	22.8	**	2451	84.4	452	15.6	***
Parity										
Primiparous	1495	78.1	419	21.9		1235	82.6	260	17.4	
Multiparous	1324	76.0	418	24.0		1148	86.7	176	13.3	
Total	2819	77.1	837	22.9		2383	84.5	436	15.5	**
Index of multiple deprivation (quintiles)										
1 (least deprived)	556	75.3	182	24.7		478	86.0	78	14.0	
2	537	76.0	170	24.0		449	83.6	88	16.4	
3	606	78.1	170	21.9		520	85.8	86	14.2	
4	618	77.3	181	22.7		519	84.0	99	16.0	
5 (most deprived)	586	79.3	153	20.7		486	82.9	100	17.1	
Total	2903	77.2	856	22.8		2452	84.5	451	15.5	
Black or minority ethnic group										
No	2340	75.7	750	24.3		1977	84.5	363	15.5	
Yes	483	84.6	88	15.4		406	84.1	77	15.9	
Total	2823	77.1	838	22.9	***	2383	84.4	440	15.6	***

** p<0.05 ** p<0.01 *** p<0.001*

Table 3 – If midwife or hospital contacted in early labour, woman asked to come in or stay home

	If contacted MW: stay home/phone again					If contacted MW: come in to hospital				
	Yes		No			Yes		No		
	N	%	N	%		N	%	N	%	
Maternal age (years)										
<20	29	50.9	28	49.1		40	69.0	18	31.0	
20-24	161	49.8	162	50.2		207	64.5	114	35.5	
25-29	362	46.0	425	54.0		514	66.2	263	33.8	
30-34	401	43.6	519	56.4		598	64.9	324	35.1	
35-39	191	39.7	290	60.3		310	63.9	175	36.1	
40+	30	34.1	58	65.9		58	61.1	37	38.9	
Total	1174	44.2	1482	55.8	*	1727	65.0	931	35.0	
Parity										
Primiparous	714	52.2	655	47.8		812	61.2	515	38.8	
Multiparous	424	35.0	789	65.0		866	69.0	389	31.0	
Total	1138	44.1	1444	55.9	***	1678	65.0	904	35.0	***
Index of multiple deprivation (quintiles)										
1 (least deprived)	249	48.3	266	51.7		305	60.3	201	39.7	
2	244	49.3	251	50.7		312	63.8	177	36.2	
3	243	42.6	327	57.4		348	63.2	203	36.8	
4	236	42.8	316	57.2		392	68.3	182	31.7	
5 (most deprived)	201	38.4	323	61.6		371	68.8	168	31.2	
Total	1173	44.2	1483	55.8	**	1728	65.0	931	35.0	*
Black or minority ethnic group										
No	962	44.9	1180	55.1		1365	63.9	770	36.1	
Yes	188	42.5	254	57.5		307	68.7	140	31.3	
Total	1150	44.5	1434	55.5		1672	64.8	910	35.2	

** p<0.05 ** p<0.01 *** p<0.001*

As many of these sociodemographic factors overlap, e.g. primiparous women are more likely to be in the younger age groups, a series of binary logistic regressions were undertaken to understand the most important factors in these associations (Tables 4 and 5). These confirmed the importance of maternal age, parity and ethnicity for worries about going in to labour; age and parity for contacting a health care professional and feeling that they had received appropriate advice. Parity and residence in an area of deprivation remained associated with being asked to come into hospital (sometimes after being asked to wait or phone back later) after adjustment for the other sociodemographic factors.

Table 4 – Binary logistic regression showing combined effects of sociodemographic factors on worries about going into labour

		Very/quite worried about not knowing when labour would start		Very/quite worried about getting to hospital in time	
		OR	(95% CI)	OR	(95% CI)
Maternal age (years)	<20	1.11	(0.72, 1.70)	0.83	(0.51, 1.33)
	20-24	1.45	(1.17, 1.79)	1.30	(1.05, 1.62)
	25-29	1.07	(0.92, 1.26)	1.18	(1.00, 1.39)
	30-34	1.00		1.00	
	35-39	1.08	(0.90, 1.28)	1.06	(0.88, 1.27)
	40+	0.81	(0.60, 1.09)	0.83	(0.61, 1.14)
Parity	Primiparous	1.00		1.00	
	Multiparous	0.71	(0.63, 0.81)	1.22	(1.07, 1.39)
Index of multiple deprivation	1 (least deprived)	1.00		1.00	
	2	0.97	(0.80, 1.18)	0.96	(0.79, 1.18)
	3	0.98	(0.81, 1.19)	1.00	(0.82, 1.22)
	4	1.04	(0.85, 1.26)	0.96	(0.78, 1.17)
	5 (most deprived)	0.85	(0.69, 1.05)	0.89	(0.72, 1.10)
Ethnicity	White	1.00		1.00	
	BME	1.91	(1.60, 2.28)	1.47	(1.23, 1.76)

BME Black or minority ethnic group

Antenatal education

It was postulated that worry about labour might be reduced in women who had attended antenatal education. Half of primiparous but only 9% of multiparous women attended NHS (free) antenatal classes, a further 23% of primiparous and 4% of multiparous women attended non-NHS classes for which they paid. For *primiparous women only*, there was a strong association between being unable to attend NHS classes, either because they were not offered or because they were booked up, and feeling 'very worried' about not knowing when labour would start (but not about getting to hospital in time). After adjustment for age, ethnicity and IMD, women who were denied antenatal classes had an Odds ratio of 1.58 (95% confidence interval 1.10-2.25) of being very worried about not knowing when labour would start. BME women were significantly less likely to attend antenatal classes due to not being offered them or them being booked up. However, those BME women who *did* attend classes were no less likely to be worried about these aspects of early labour.

Table 5 – Binary logistic regression showing combined effects of sociodemographic factors on experience of contacting midwife or hospital in early labour

		Contacted HCP at start of labour		Received appropriate advice		Asked to come into hospital	
Maternal age (years)	<20	0.80	(0.53, 1.23)	0.50	(0.27, 0.92)	1.24	(0.69, 2.25)
	20-24	0.94	(0.77, 1.16)	0.56	(0.41, 0.78)	0.98	(0.74, 1.29)
	25-29	1.15	(0.99, 1.35)	0.80	(0.61, 1.04)	1.11	(0.90, 1.37)
	30-34	1.00		1.00			
	35-39	0.95	(0.80, 1.12)	1.10	(0.79, 1.53)	0.93	(0.73, 1.17)
	40+	0.51	(0.38, 0.68)	1.62	(0.76, 3.43)	0.76	(0.49, 1.18)
Parity	Primiparous	1.00		1.00		1.00	
	Multiparous	0.88	(0.78, 0.99)	1.25	(1.01, 1.56)	1.47	(1.24, 1.75)
Index of multiple deprivation	1 (least deprived)	1.00		1.00		1.00	
	2	0.92	(0.76, 1.12)	0.86	(0.61, 1.20)	1.21	(0.93, 1.58)
	3	1.07	(0.89, 1.29)	1.07	(0.76, 1.51)	1.14	(0.88, 1.48)
	4	0.96	(0.79, 1.16)	0.94	(0.67, 1.32)	1.37	(1.05, 1.78)
	5 (most deprived)	1.03	(0.84, 1.25)	0.89	(0.63, 1.27)	1.32	(1.00, 1.73)
Ethnicity	White	1.00		1.00		1.00	
	BME	1.16	(0.98, 1.38)	0.90	(0.68, 1.19)	1.15	(0.92, 1.45)

BME Black and minority ethnic group

Qualitative results

Fifty-nine women wrote free-text comments relating to early labour. Table 6 shows the characteristics of these women compared to survey respondents overall. They were disproportionately older, primiparous, more educated and resident in the least deprived quintiles but none of the differences was statistically significant. Table 7 shows the main themes that arose from the free-text comments relating to early labour. These were '*Assumptions about identifying active labour*', '*Staff attitudes*', '*Not being allowed…*', '*Previous labours*', and '*The consequences for women*'. Individual quotations are used to illustrate these themes.

Table 6 – Sociodemographic characteristics of women who wrote free-text comments relating to early labour compared to all respondents

		Women who wrote free-text comments relating to early labour		All women who completed the questionnaire	
		N	%	N	%
Maternal age (years)	16-24	7	11.9	640	14.0
	25-34	22	37.3	2818	61.6
	35 or more	30	50.8	1118	24.2
Parity	Primiparous	32	56.1	2207	49.8
	Multiparous	25	43.9	2223	50.2
Ethnicity	White	49	84.5	3715	83.9
	BME	9	15.5	713	16.1
Index of multiple deprivation	1 (least deprived)	15	25.4	901	19.7
	2	12	20.3	867	18.9
	3	13	22.0	935	20.4
	4	9	15.2	978	21.4
	5 (most deprived)	10	16.9	896	19.6
Left FT education aged <16 years		6	10.3	757	16.9
Left FT education aged 16 years or more		53	89.7	3727	83.1

BME Black and minority ethnic group; FT full time

Assumptions about identifying women in active labour

Women understood that to be credible and viewed by midwives as genuinely in labour, they had to meet certain criteria regarding frequency and duration of contractions. However, not all women in active labour met these criteria:

> *Contractions started on a Weds, had the baby on a Saturday. Kept ringing the maternity ward to be told not to come in until I was 3-10-1 (3 contractions in 10 minutes, lasting 1 minute each). That isn't going to apply to everyone and [one] should be invited into hospital. [Primip, IMD1, 25-29 yrs, white]*

> *The only time I felt a little bit more believed was when I called the hospital when my contractions were 5 mins apart ... [Multip, IMD1, 35-39 yrs, white]*

Table 7 – Main themes and examples arising from the qualitative analysis

Themes	Examples
Assumptions about identifying active labour	'Rules' about contractions Behaviour of women in active labour Having to pretend/exaggerate about contractions
Staff attitudes	Insensitive, rude, abrupt, dismissive, negative response Being made to feel foolish Feeling vindicated – women in active labour not early labour as staff had thought Received inappropriate advice: stay home, have bath, take paracetamol
Not being allowed…	To come in, to stay – sent home, unit busy Be examined/checked - having to beg for VE
Previous labours	Primiparous women needing reassurance, being uncertain Multiparous women having experience, recognising active labour, being dismissed
The consequences for women	Rushed delivery - insufficient time for preparation & pain relief Not a normal birth - Instrumental/operative delivery Upset - distress, delayed attachment to baby

[…] Called hospital 9 hours later, told midwife I had urge to push, still advised to stay home due to contraction frequency. Felt very uncomfortable, husband called 999, waters broke as soon as ambulance came and I began pushing at home. Decided to go to hospital by ambulance, baby born shortly after arrival. [Primip, IMD1, 25-29 yrs, white]

Went into hospital in labour 3 min contractions and sent home again as only 1.5 cm dilated - less than 2 hours later I gave birth, crowning in the hospital car park, head out in the elevator. This was very traumatic and wish they allowed me to stay instead of stranding me at home. [Primip, IMD5, 30-34 yrs, white]

Women also reported that midwives judged from their voice and behaviour whether they were in active labour. Some women therefore deliberately 'acted' the part:

When we went into labour with this baby, I phoned the hospital twice and both times they said I didn't sound like I was in labour and suggested I stay at home, […] They made us feel a bit silly for coming into hospital, as I wasn't "screaming and shouting", they assumed I was only in early labour. [Multip, IMD3, 35-39 yrs, white]

[…] After my husband lied to the hospital about the time between contractions I was eventually told to come in. Although my waters hadn't broken I was already 6 cm dilated. [Primip, IMD2, 30-34 yrs, white]

The advice/instruction I was given was to telephone the MLU once contractions were every 2/3 minutes apart or if my waters broke etc. My contractions were irregular throughout my entire labour [...] I felt I needed to lie and state my waters had broke […] in order to be able to attend hospital in order for them to examine me… [Primip, IMD5, 30-34 yrs, white]

Staff attitudes

Many women reported negative staff attitudes both on the phone and when attending the unit for assessment. Women were made to feel foolish by midwives who were insensitive, rude, abrupt and dismissive:

I was distressed during my labour as one of the midwives was very patronising in telling me that my contractions weren't as painful as I was experiencing, she sent me home twice. [Primip, IMD5, 30-34 yrs, BME]

[...] I had to scream/cry down the phone before she abruptly told me "you better come in then" not a pleasant experience. [Multip, IMD3, 30-34 yrs, white]

Another common theme was women feeling vindicated, the midwife having assumed that they were not in active labour, but upon examination, they were close to full dilatation:

I knew I was further along than they assumed and insisted on an exam where they discovered I was 6cm and baby came 3 hours later! [Multip, IMD3, 35-39 yrs, white]

Eventually I rang back to say I want to come in to be checked over only to be told "well you will probably end up going home anyway". […] Would like to point out when arrived at hospital when I was checked over I was 9 cm. [Primip, IMD1, 25-29 yrs, white]

Not being allowed…

Women reported not being allowed to come into hospital, not being allowed to stay, and in a few cases, having to beg for a vaginal examination. This made them more anxious as they felt that hospital was a safer place than home:

Labour was slow so kept getting told to stay at home - that was very distressing and made me more anxious. [Primip, IMD3, 25-29 yrs, BME]

I felt quite pushed back from the hospital when I phoned. I was bleeding (my show) and having regular pains but I just got told to stay at home and if I went through they would just send me away. [Primip, IMD5, 20-24 yrs, BME]

Crying out in pain and begging for midwife to check over/do internal to see how dilated. Only then discovered 6/7 cm dilated and wheeled in wheelchair to labour ward. [Primip, IMD1, 25-29 yrs, white]

In addition, some women reported that staff did not take account of their travel time, necessitating several lengthy and uncomfortable journeys:

My waters broke 11.30pm - phoned hospital told to go in […] Got told to go home as it was my 1st baby - told to look out for contractions […] by 7am I was in pain - phoned hospital told to go back in - my 3rd 40 min journey - when I got to hospital - got told I was in the very early stages of labour - not checked at all and got told to go home […] Got home - another 40 min journey. Started bleeding was being sick and in pain - phone hospital again and got told to go back AGAIN

[…] When I got to the hospital, I couldn't walk […] Got to the labour ward on the 6th floor - told I was fully dilated and the head was there […] [Primip, IMD3, 35-39 yrs, white]

The above quote also illustrates a sub-theme of 'Not being checked' which was reported by several women and was associated with delay in diagnosis of active labour and inappropriate management:

The midwives were very supportive and polite, the only thing I was unhappy about was that I was sent home after my water broke, without doctor assessment, few hours later I had vaginal bleeding and me and my husband rushed to the hospital. [Primip, IMD4, 30-34 yrs, white]

[…] labour started naturally at 1am. I informed the midwife at 5am but she refused to believe I was in established labour. By the time I convinced her to check me at 7:45am, I was 9cm dilated and baby was born within next ten mins. The lesson to be learnt is that some midwives will only take you seriously if you are screaming in pain. [Multip, IMD4, 25-29 yrs, ethnicity missing]

Previous labours

Some midwives were reportedly unwilling to take account of parity in assessing whether a woman was in early or active labour. Primiparous women clearly need more support and reassurance:

Being my first pregnancy when I went into labour I was unsure. […] I feel for first time mums - a little more understanding at the hospital that we don't know what our bodies are doing would help. [Primip, IMD2, 30-34 yrs, white]

Multiparous women who had experienced labour before are likely to recognise the different stages and sometimes reported not being listened to. Advice to other women included *"you know your body"* and *"trust your instincts".*

[…] My husband was told to leave and I was transferred to a ward. I was still having contractions but told it would be ages until active labour. I explained my contractions were always irregular but once pain increased the 2nd stage would be very quick [...] My husband was still told to go home. After he left I started having more painful contractions and called for the midwife. She

checked me and thought active labour had started and went to call the labour ward. I had to call her back 5 minutes later as I needed to start pushing. I called my husband but he did not get there in time. It was a very scary experience as there was no equipment in the room to deliver the baby (as it was a normal antenatal ward) […] [Multip, IMD3, 30-34 yrs, BME]

When I went into labour with my 3rd child I called the labour ward and wanted to come into hospital but they wouldn't let me. I didn't feel like she was listening to me even though I said I labour quickly. By the time I got to hospital I was in too much pain to have IV's [for Group B strep]. If I'd gone into hospital when I wanted to then I would have had pain relief sooner and would have received the antibiotics. [Multip, IMD5, 35-39 yrs, white]

The consequences for women

Many of the women who had felt let down by staff in early labour, having to stay at home when they wanted to be in hospital, went on to report a failure to get appropriate pain relief and medication (as in the previous quote), a rushed, sometimes operative, delivery, feelings of shock and delayed attachment to their baby:

[…] Felt unhappy as hadn't had chance for pain relief option and baby had become distressed. Felt that I should have been kept in hospital when first went in or made to feel more welcome on phone. Not the way I wanted my labour to be and was worrying for me and my husband. [Primip, IMD1, 25-29 yrs, white]

My labour was a bit stop-start and the unit suggested I didn't come in until the contractions were every 3 mins and at least 1 minute in duration. I don't feel this was the right advice for me and regret not going to get checked out as I think if I had gone in after my contractions were about 5 minutes, I may have had a natural birth rather than C-section. However, the care I received was excellent other than that. [Primip, IMD2, 25-29 yrs, white]

[…] My baby's head was already out by the time the midwife arrived in the room. I had to have my baby standing up as there was not time to get on the bed. I was in complete shock when my baby was born due to this and I did not feel the immediate rush of love for my baby because I was in too much shock and pain. [Multip, IMD3, 30-34 yrs, white]

Some women ascribed their poor experiences to staff shortages or the facilities being particularly busy:

I feel that women are expected to go through the biggest proportion of labour on their own at home because there are not enough staff. I felt that it was left until the last minute to take me to a labour room. I was even told they had to move someone to get me in. I felt alone helpless and confused as to why I had been told to wait in an antenatal ward as I was `only' in the early stages and couldn't have pain relief or support from a midwife. I had to force my husband to go and get someone as I could not cope with the pain. When they came they examined me and then panicked and got gas and air and rushed to get me a room! When I got into a labour room I asked for an epidural as I had lost all composure and could not cope anymore. I strongly feel that if I had had the support of a midwife a lot sooner I would not have needed an epidural or the following ventouse delivery […] [Primip, IMD2, 30-34 yrs, white]

They [staff] were horribly rushed, kept saying things would happen that didn't happen, didn't pass information between colleagues, and didn't give us consistent information. It was clear that they were horribly overworked and were dealing with people in more priority than me. I feel confident that I would have got more attention had I been higher priority (I wasn't at risk) but it was an unpleasant experience where I felt powerless and confused for a lot of the time … [Primip, IMD2, 30-34 yrs, white]

All the free-text comments relating to early labour were negative so it was not possible to estimate the association between qualitative comments and the quantitative measure of satisfaction with care during labour and birth. However, among women who wrote a free-text comment relating to

early labour, only 32.1% were very satisfied with their care at this time compared to 62.8% in the whole sample. The proportions who were very dissatisfied were 7.1% and 2.3% respectively. Similarly, whilst 84% of women overall felt that they received appropriate advice when they phoned a midwife in early labour, only 36% of women who wrote free-text comments considered the advice appropriate.

DISCUSSION

The findings of this study suggest that there is considerable variation in women's experience of early labour depending on sociodemographic characteristics. Although the differences by parity are to be expected, the significantly increased worry among BME women is more surprising. However, it confirms the findings of a previous study which found that ethnic minority women were more likely to report high levels of worry about almost all aspects of birth irrespective of parity and residence in an area of deprivation.(29) After adjusting for parity, ethnicity and IMD, women aged 20-24 years were also more likely to be worried about not knowing when labour would start and about getting to hospital in time and, again, this is consistent with earlier research.(22) Women in this age group were also significantly less likely to feel that they received appropriate advice when they phoned a midwife or the hospital.

Primiparous women who were not able to attend NHS antenatal classes, either because they were not offered or because they were booked up, were significantly more likely to be very worried about not knowing when labour would start. This finding persisted after adjustment for sociodemographic characteristics. This is consistent with the findings of a Danish randomised controlled trial which found that antenatal education in small groups increased women's confidence in their ability to cope at home during labour.(30) However, the women who were unable to access NHS antenatal education in the current study were also significantly less likely to have planned their pregnancy or to have booked before 10 weeks. Thus, they may have been more worried generally.

The free-text comments relating to women's experience of early labour were entirely negative. This partly reflects the propensity for respondents to write additional comments when they have an issue about which they would like to comment or complain.(27) To put it into context, over three-quarters of women contacting a midwife or hospital at the start of labour reported receiving good advice but the corresponding proportion for women who wrote free-text responses on this topic was just over a third. The main themes related to staff assumptions and attitudes, and not being allowed to come to hospital or stay, and these resonate strongly with earlier studies.(2, 16-18, 20, 31) In particular, the study by Spiby et al (2014)(20) used focus groups to understand the views of UK midwives dealing with women in early labour. They found that some midwives held negative perceptions and stereotypes of women and labelled them accordingly. Studies which analysed this subject from women's perspectives underscored the importance to women of arriving at the hospital at the 'right time', the distress associated with being sent home, and the impact of having a caring or uncaring midwife, of being believed.(2, 16) The neglect felt by some women at this time echoes the results of a study of women's experience of the early phase of induction of labour.(32)

The other two themes that arose in this study related to parity and the consequences for women of poor early labour care. Parity is not mentioned in the literature although some studies only included primiparous women.(12, 14, 17, 18) In this study, the issues facing primiparous and multiparous women differed: primiparous women wanted more support and reassurance whereas multiparous women, having already experienced labour, remembered how it felt and were sometimes angry at not being believed. Some women reported negative consequences resulting from inaccurate diagnosis of labour. These included a lack of time for pain relief, medication and delayed attachment to their baby, also women who thought that an operative delivery may have been avoided had early labour been better managed. Although this latter outcome has been demonstrated to result from admission in early labour,(1, 2) no qualitative studies have reported on this.

A strength of this study is that it was based on a large random sample of births in England and uses both quantitative and qualitative data from the same primiparous and multiparous women. Limitations include the 47% response rate with under-representation of young women, those born outside the UK, and women resident in deprived areas.(25) Similarly, the free-text comments were disproportionately from primiparous, more educated women, and those resident in the least deprived quintile. However, qualitative research aims to be transferable rather than generalisable and the characteristics of women who wrote free-text comments are shown in Table 6. Moreover, the findings are consistent with those of other studies and the numbers of women, even in minority groups, are substantial.

Conclusions and implications for practice

These findings reinforce those of other studies stressing the importance of providing reassurance to women in early labour, taking care that women do not feel neglected or dismissed. In particular, young primiparous women and those from minority ethnic groups report greater worry about aspects of early labour than other women and require additional reassurance. Whilst most women who are not contracting strongly and regularly can be reassured that they can safely stay at home, some women labour very rapidly. The Norwegian midwives cited in the study by Eri et al (2011)(19) recommended that women come into hospital to be assessed and to see how their labour progresses. If they are not in active labour, they can then decide for themselves that they would be more comfortable at home and feel confident in going home.(19) This model may require additional resources to set up, but if it helps women to come into hospital in active labour, it may save resources overall.

Antenatal education may have a role in improving women's and partners' knowledge and confidence in coping at home but a recent systematic review reported a lack of good evidence as to its effectiveness in promoting good obstetric and psychosocial outcomes more generally.(33)

In summary, most women were not particularly worried about early labour and most of those who contacted a midwife at this time felt that they received appropriate advice. However, some women clearly felt that their care at this time had been poor suggesting that this is an area where improvements could be made.

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COMPETING INTERESTS

The authors declare that they have no competing interests.

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AUTHORS' CONTRIBUTIONS

JH initiated this study, conducted the analyses and drafted the manuscript. MR was the principal investigator for women's surveys and helped direct the analysis. Both authors revised the manuscript.

DATA SHARING STATEMENT

Further analyses of these data are planned so data will not be shared until these are completed.

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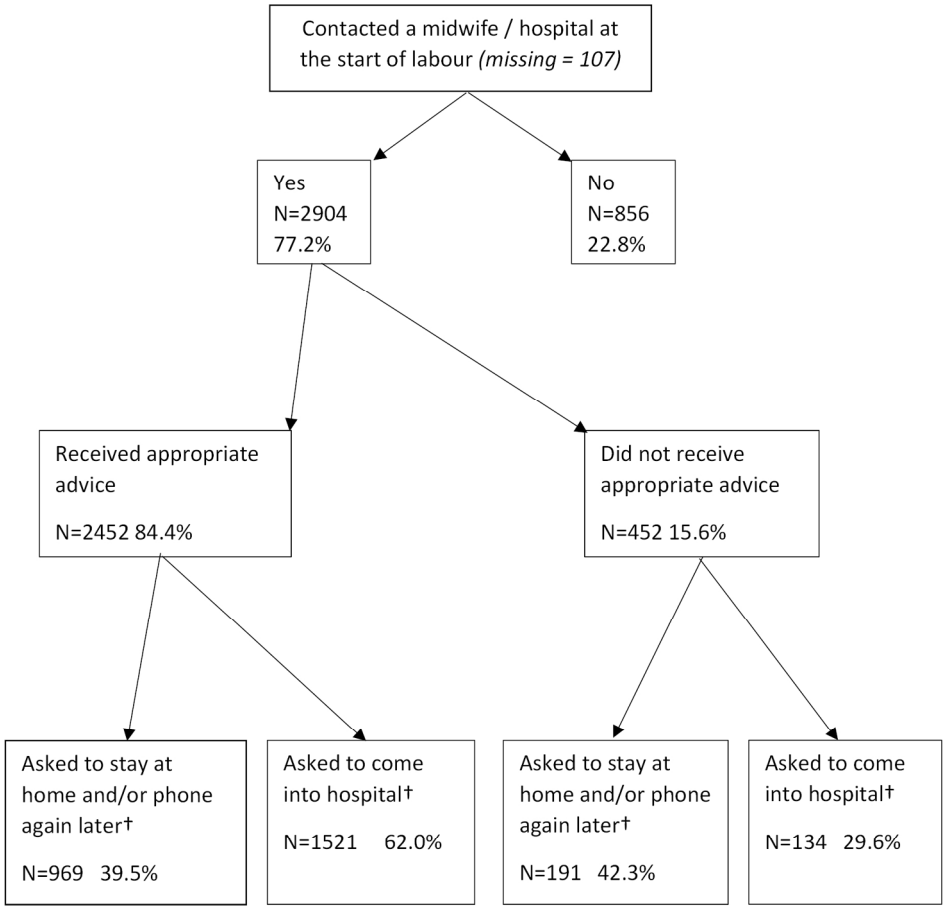
Figure 1 – Numbers and proportions of women contacting midwife or hospital at the start of labour and resulting care (of the 3867 women who laboured)



† Not exclusive categories

159x199mm (300 x 300 DPI)

STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No	Recommendation	Page
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4-6
Objectives	3	State specific objectives, including any prespecified hypotheses	6
Methods			
Study design	4	Present key elements of study design early in the paper	6
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	6
Participants	6	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants	6
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed *Case-control study*—For matched studies, give matching criteria and the number of controls per case	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6-7
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	6-7
Bias	9	Describe any efforts to address potential sources of bias	7
Study size	10	Explain how the study size was arrived at	6
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	7
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	7
		(*b*) Describe any methods used to examine subgroups and interactions	
		(*c*) Explain how missing data were addressed	
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed *Case-control study*—If applicable, explain how matching of cases and controls was addressed *Cross-sectional study*—If applicable, describe analytical methods taking account of sampling strategy	
		(*e*) Describe any sensitivity analyses	

Continued on next page

Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	7-8
		(b) Give reasons for non-participation at each stage	
		(c) Consider use of a flow diagram	Fig 1
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	Tables 1-3
		(b) Indicate number of participants with missing data for each variable of interest	
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)	
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time	
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	
		Cross-sectional study—Report numbers of outcome events or summary measures	Tables 1-3
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	Tables 4-5
		(*b*) Report category boundaries when continuous variables were categorized	
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	
Discussion			
Key results	18	Summarise key results with reference to study objectives	20
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	22
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	20-22
Generalisability	21	Discuss the generalisability (external validity) of the study results	22
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	23

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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Sociodemographic differences in women's experience of early labour care: a mixed methods study

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Sociodemographic differences in women's experience of early labour care: a mixed methods study

Jane Henderson BSc(Hons) MSc PhD*

Maggie Redshaw BA PhD CPsychol

Policy Research Unit in Maternal Health and Care,

National Perinatal Epidemiology Unit,

Nuffield Department of Population Health,

University of Oxford,

Old Road Campus,

Old Road,

Oxford, UK

* Corresponding author

Tel: 01865 289758; Fax: 01865 289701

Email: jane.henderson@npeu.ox.ac.uk

Email: maggie.redshaw@npeu.ox.ac.uk

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Abstract

Objectives: To explore women's experiences of early labour care focussing on sociodemographic differences, and to examine the effect of antenatal education, using mixed methods.

Setting: England, 2014.

Participants: Women who completed postal questionnaires about their experience of maternity care, including questions about antenatal education, early labour and sociodemographic factors, included space for free-text comments.

Outcome measures: Worries about labour, contact with midwives in early labour and subsequent care.

Methods: This study was based on secondary analysis of a national maternity survey carried out in England in 2014. Quantitative data were analysed using descriptive statistics and binary logistic regression, qualitative data were analysed using a thematic content analytic approach.

Results: Completed questionnaires were received from 4578 women (47% response rate). There were significant differences by sociodemographic factors, particularly ethnicity, in women's worries about early labour. Compared to White women, women from Black or minority ethnic groups had an adjusted Odds ratio of 1.93 (95% confidence interval 1.56, 2.39) of feeling worried about not knowing when labour would start. Among women who contacted a midwife at the start of labour, 84% perceived their advice as appropriate, more in older and multiparous women. Overall, 64% of women were asked to come in to hospital at this time, more in multiparous women (adjusted Odds ratio 1.63, 95% confidence interval 1.35, 1.96). Those who did not have access to antenatal education experienced greater worry about early labour. Five themes emerged from the qualitative analysis: '*Differentiating between early and active labour*', '*Staff attitudes*', '*Not being allowed…*', '*Previous labours*', and '*Perceived consequences for women*'.

Conclusions: These findings reinforce the importance of providing reassurance to women in early labour, taking care that women do not feel neglected or dismissed. In particular, primiparous and ethnic minority women reported greater worry about early labour and require additional reassurance.

Article summary

Strengths and limitations of the study

- Large study based on random sample of birth registrations in England.
- Both quantitative and qualitative data from women relating to early labour.
- Response rate of 47% makes generalisation difficult.
- Respondents, especially those who wrote free-text comments, predominantly primiparous, educated, and resident in less deprived areas.

INTRODUCTION

Early labour, also known as the latent phase, has been defined in a number of different ways but the National Institute for Health and Clinical Excellence (NICE) defines it as a period of time when there are painful contractions and some cervical change.(1) Early labour is usually a slow process during which women may feel distress and anxiety, and lose confidence in their ability to cope.(2) The resulting stress hormones may counter the effects of oxytocin and slow the progress of labour(3) resulting in further anxiety and distress.

Many observational studies have noted that admission to hospital prior to active labour increases the risk of oxytocin augmentation, epidural analgesia and caesarean section.(4-9) Health professionals therefore strongly recommend to women that they stay home as long as possible, until contractions are as frequent as three in ten minutes. This cut-off is based on a graphic approach developed by Friedman in the 1950s.(10) However, for women, the negative effects of staying at home in pain include confusion, anger and resentment, feeling neglected, unsupported and anxious.(2) It has been estimated that between 30% and 45% of women are admitted to hospital prior to active labour.(11, 12)

A randomised trial of an intervention providing additional support to women at home during early labour resulted in more admissions in active labour, reduced use of analgesia, reduced neonatal morbidity, and increased maternal satisfaction although emotional wellbeing and distress did not differ between the groups.(12) Other studies have found no significant benefit associated with structured care involving one-to-one care, positioning techniques, and positive imagery in early labour,(13) or use of an algorithm for defining active labour based on presence of painful, regular, moderate or strong contractions and either cervical effacement and dilation of at least 3cm, spontaneous rupture of membranes, or a 'show'.(14)

Several studies have used qualitative techniques to examine women's views and experience of care in early labour.(15-18) The findings of these studies reflect women's uncertainty and anxiety about

presenting at hospital at the right time, worry about being sent home if they arrive too early, their need for validation, the pressure as well as support provided by friends and family, surprise and consternation regarding the intensity of pain in early labour, and fatigue resulting in reduced ability to cope. Other qualitative studies have examined the care of women in early labour from the midwives' perspective.(19, 20) These stress the importance of providing reassurance to the woman and her family and normalising the situation. However, they differed in overall paradigm which may reflect differences in the organisation of care in Norway and the UK. The Norwegian study(19) acknowledged that some women labour quickly and clinical judgement on the phone is necessarily limited. These midwives believed that it was best for women to come to hospital for assessment if they wished and then to feel sufficiently informed and empowered to make the decision to return home if they were not in active labour. In contrast, the midwives in the UK study(20) stressed the importance of the midwives' role as 'gatekeeper' acknowledging that they had different priorities from the women. They reported that they could tell from a woman's voice, or through intuition, whether she was in active labour. Moreover, some midwives used trivialising language to describe women in early labour such as 'frequent flyers'. They acknowledged that although labour ward workload should not take precedence over women's experience, it often did.(20)

Only one study used quantitative techniques to explore women's experience of early labour.(17) They reported that 46% of women were aware of the expectation that they would stay at home during early labour, and that being made to feel unwelcome, not being treated with respect or as an individual were associated with feeling dissatisfied with care in early labour. This was exacerbated if they were sent home more than once without follow-up arrangements being made, or felt discouraged from returning, especially if they felt that this was due to the unit being busy rather than it being clinically appropriate.

No studies have examined the early labour experiences of women from different sociodemographic groups although evidence from other studies suggests that women from more disadvantaged groups

have poorer experience of maternity care.(21-26) The aims of this study were therefore (i) to explore the experiences of early labour care, both quantitatively and qualitatively, among women with different sociodemographic characteristics, and (ii) to determine whether women who attended antenatal education were less worried about early labour and less likely to go to hospital early.

METHODS

This study involved secondary analysis of a national maternity survey carried out in England in 2014.(27) Ten thousand women were randomly selected from birth registration statistics by staff at the Office for National Statistics (ONS) excluding those aged less than 16 years and those whose baby had died. The questionnaire, together with a letter, information leaflet, and a sheet with a single sentence in 18 non-English languages (providing a Freephone number for an interpreter), encouraged women to complete the questionnaire and return it in a Freepost envelope. These were sent to women at three months postpartum. The questionnaire could also be completed online. Using a tailored reminder system, up to three reminders were sent as required.

A mixed methods design was used with the questionnaire including both closed and open questions. Women were asked about their experience of maternity care including early labour, and also asked questions about sociodemographic characteristics and whether they attended antenatal classes. Using a validated worries checklist they were asked a range of questions, including if, before labour started, they were worried about not knowing when they would go into labour, and about getting to the hospital in time (answer options: very, quite, not very, not at all worried).(28) Women who had a labour were asked if they contacted a midwife or the hospital at the very start of their labour, and if so, whether they felt that they were given appropriate advice and support. If they had contacted a midwife or the hospital, they were asked about the response, that is, whether they were asked to come into the hospital, stay at home, wait and phone again, or phone again if worried. We have considered this as early labour care although we acknowledge that it may have also included women in active labour. All data were necessarily based on women's perception and recall of events.

There was space for free-text comment at the point in the questionnaire relating to early labour and at the end. Women were also asked what they would like to tell other women about having a baby in that hospital or unit. These free-text comments were the sole source of qualitative data.

ONS provided information about each woman's age group, country of birth, marital status, and an area based measure, the Index of Multiple Deprivation (IMD) in quintiles, which enabled comparison of responders and non-responders. In this study, IMD, ethnicity (White vs. Black or minority ethnic group (BME)), maternal age in six categories, and parity (primiparous vs. multiparous) were included as sociodemographic variables. Women who had an induction of labour or caesarean planned and carried out before labour were excluded from the analysis.

A descriptive analysis was carried out using raw percentages to establish how sociodemographic groups' experiences differed in their worries about early labour, whether they contacted a health care professional in early labour and received appropriate advice. Differences were tested using the chi-square statistic. As there was likely to be overlap between different sociodemographic factors, binary logistic regression was used to estimate the extent of this, to determine the main drivers for any differences seen, and to test the effect of antenatal education. Binary logistic regressions were adjusted for each of the sociodemographic variables. All quantitative analyses were carried out in Stata version 13.

Free-text responses to the questions relating to care in early labour and at the end of the questionnaire were analysed following the method of Garcia et al (2004).(29) Responses were filtered using the keywords 'early', 'latent', 'sent home', 'come/came back', and 'return' then read and selected if they referred to early labour. Comments were read and coded in an iterative process by both authors, coding themes as they arose using a thematic content analytic approach. Where differences in interpretation arose these were resolved by discussion and reference to the raw data. Deviant cases were sought, and triangulation with quantitative data on satisfaction was used to test the credibility and trustworthiness of the findings.(30)

Ethical approval for the survey was obtained from the NRES committee for Yorkshire and The Humber – Humber Bridge (REC reference 14/YH/0065). Written informed consent from participants was not considered necessary; consent was implicit in completion and return of the questionnaire.

RESULTS

Completed questionnaires were received from 4578 women representing a 47% usable response rate. Of these 398 had a planned caesarean section carried out before labour had started, and 1081 had an induction of labour. These were excluded from the analyses leaving 3099 women. These were 49% primiparous, 83% White, and 42% aged 30 years or more. Compared to non-respondents, women who completed the questionnaire were significantly more likely to be older, married, living in a less deprived area and born in the UK.(27)

Quantitative results

The descriptive statistics shown in Table 1 indicate considerable differences in women's worries about early labour and in their care at this time. Worry about knowing when labour would start was significantly greater in primiparous women and those from BME groups. Worry about getting to hospital in time was significantly greater in multiparous women and, again, those from BME groups.

Overall, 88% of women contacted a midwife or the hospital at the start of labour (Table 2). This was significantly less likely in women ages 40 years or more and in multiparous women. Overall, 84% of women reported receiving appropriate advice at this time, with significantly more reporting this among older and multiparous women. Women were more likely to consider the advice appropriate if it included coming into hospital (Figure 1). Overall, two-thirds of women were eventually asked to come in to the hospital to be assessed, but 48% were at some point asked to stay at home and phone again later. This latter was significantly more common in primiparous women (Table 3).

Table 1 – Sociodemographic characteristics of women with worries about early labour

	Worry about knowing when labour would start (Missing=106)					Worry about getting to hospital in time (Missing=112)				
	Very/quite worried		Not very/at all worried			Very/quite worried		Not very/at all worried		
	No.	%	No.	%		No.	%	No.	%	
Maternal age (years)										
<20	40	51.9	37	48.1		54	69.2	24	30.8	
20-24	159	46.2	185	53.8		209	60.6	136	39.4	
25-29	441	53.3	386	46.7		510	61.6	318	38.4	
30-34	579	54.0	494	46.0		673	62.9	397	37.1	
35-39	298	53.2	262	46.8		338	61.1	215	38.9	
40+	61	55.0	50	45.0		71	63.4	41	36.6	
Total	1578	52.7	1414	47.3		1855	62.1	1131	37.9	
Missing=1										
Parity										
Primiparous	713	49.3	733	50.7		944	65.4	499	34.6	
Multiparous	834	56.7	637	43.3		866	59.1	600	40.9	
Total	1547	53.0	1370	47.0	***	1810	62.2	1099	37.8	***
Missing=104										
Index of multiple deprivation (quintiles)										
1 (least deprived)	322	55.0	263	45.0		370	63.4	214	36.6	
2	315	54.1	267	45.9		367	62.8	217	37.2	
3	329	53.8	282	46.2		381	62.7	227	37.3	
4	317	49.3	326	50.7		389	60.6	253	39.4	
5 (most deprived)	296	51.8	275	48.2		348	61.3	220	38.7	
Total	1579	52.8	1413	47.2		1855	62.1	1131	37.9	
Missing=1										
Black or minority ethnic group										
No	1341	55.0	1098	45.0		1557	63.7	886	36.3	
Yes	195	41.0	281	59.0		251	53.3	220	46.7	
Total	1536	52.7	1379	47.3	***	1808	62.0	1106	38.0	***
Missing=109										

** p<0.05 ** p<0.01 *** p<0.001*

Table 2 – Sociodemographic characteristics of women contacting a health professional at the start of labour

	Contacted a MW/hospital at start of labour					Received appropriate advice				
	Yes		No			Yes		No		
	No.	%	No.	%		No.	%	No.	%	
Maternal age (years)										
<20	60	87.0	9	13.0		45	75.0	15	25.0	
20-24	294	91.0	29	9.0		224	76.2	70	23.8	
25-29	699	90.3	75	9.7		588	84.1	111	15.9	
30-34	846	86.6	131	13.4		722	85.3	124	14.7	
35-39	430	85.7	72	14.3		379	88.1	51	11.9	
40+	71	78.0	20	22.0		66	93.0	5	7.0	
Total	2400	87.7	336	12.3	**	2024	84.3	376	15.7	***
Parity										
Primiparous	1199	90.8	122	9.2		988	82.4	211	17.6	
Multiparous	1139	84.6	207	15.4		985	86.5	154	13.5	
Total	2338	87.7	329	12.3	***	1973	84.4	365	15.6	**
Index of multiple deprivation (quintiles)										
1 (least deprived)	475	88.8	60	11.2		411	86.5	64	13.5	
2	469	86.4	74	13.6		391	83.4	78	16.6	
3	496	89.0	61	11.0		422	85.1	74	14.9	
4	496	86.1	80	13.9		418	84.3	78	15.7	
5 (most deprived)	464	88.4	61	11.6		383	82.5	81	17.5	
Total	2400	87.7	336	12.3		2025	84.4	375	15.6	
Black or minority ethnic group										
No	1969	87.4	285	12.6		1661	84.4	308	15.6	
Yes	375	89.7	43	10.3		314	83.7	61	16.3	
Total	2344	87.7	328	12.3		1975	84.3	369	15.7	

** p<0.05 ** p<0.01 *** p<0.001*

Table 3 – If midwife or hospital contacted in early labour, woman asked to come in or stay home

	If contacted MW: stay home/phone again					If contacted MW: come in to hospital				
	Yes		No			Yes		No		
	No.	%	No.	%		No.	%	No.	%	
Maternal age (years)										
<20	25	49.0	26	51.0		37	71.2	15	28.8	
20-24	141	54.7	117	45.3		155	62.2	94	37.8	
25-29	334	51.2	318	48.8		404	64.2	225	35.8	
30-34	375	47.7	411	52.3		495	63.7	282	36.3	
35-39	175	43.3	229	56.7		256	63.5	147	36.5	
40+	27	39.7	41	60.3		42	60.0	28	40.0	
Total	1077	48.5	1142	51.5	*	1389	63.7	791	36.3	
Parity										
Primiparous	641	57.6	472	42.4		617	58.8	433	41.2	
Multiparous	405	38.6	644	61.4		740	68.8	335	31.2	
Total	1046	48.4	1116	51.6	***	1357	63.9	768	36.1	***
Index of multiple deprivation (quintiles)										
1 (least deprived)	233	52.0	215	48.0		260	60.3	171	39.7	
2	228	52.4	207	47.6		258	61.3	163	38.7	
3	221	47.3	246	52.7		277	62.1	169	37.9	
4	208	46.2	242	53.8		314	67.8	149	32.2	
5 (most deprived)	186	44.4	233	55.6		281	66.9	139	33.1	
Total	1076	48.5	1143	51.5		1390	63.7	791	36.3	
Black or minority ethnic group										
No	886	48.7	933	51.3		1130	63.3	655	36.7	
Yes	170	49.0	177	51.0		223	65.2	119	34.8	
Total	1056	48.8	1110	51.2		1353	63.6	774	36.4	

** p<0.05 ** p<0.01 *** p<0.001*

A series of binary logistic regressions was undertaken to understand the most important factors in the associations between sociodemographic variables and perceptions of early labour care (Tables 4 and 5). These confirmed the importance of parity and ethnicity for worries about going in to labour, and suggested that women aged 20-24 years experienced greater worry about not knowing when labour would start. Multiparous women and those aged 40 years or more were significantly less likely to contact a health care professional; and women aged 20-24 years were significantly less likely

to feel that they had received appropriate advice. Parity and, marginally, residence in an area of deprivation remained associated with being asked to come into hospital (sometimes after being asked to wait or phone back later) after adjustment for the other sociodemographic factors.

Table 4 – Binary logistic regression showing effects of sociodemographic factors on worries about going into labour, each variable adjusted for all others

		Very/quite worried about not knowing when labour would start		Very/quite worried about getting to hospital in time	
		OR	(95% CI)	OR	(95% CI)
Maternal age (years)	<20	0.98	(0.60, 1.61)	0.78	(0.46, 1.35)
	20-24	1.41	(1.09, 1.83)	1.20	(0.92, 1.57)
	25-29	0.96	(0.79, 1.16)	1.10	(0.90, 1.33)
	30-34	1		1.00	
	35-39	1.08	(0.88, 1.34)	1.05	(0.85, 1.31)
	40+	0.91	(0.61, 1.37)	0.89	(0.59, 1.35)
Parity	Primiparous	1.00		1.00	
	Multiparous	0.72	(0.62, 0.84)	1.30	(1.11, 1.52)
Index of multiple deprivation	1 (least deprived)	1.00		1.00	
	2	0.94	(0.74, 1.19)	0.96	(0.75, 1.23)
	3	0.98	(0.77, 1.24)	1.01	(0.80, 1.29)
	4	1.13	(0.89, 1.42)	1.00	(0.78, 1.27)
	5 (most deprived)	0.91	(0.71, 1.17)	0.92	(0.71, 1.19)
Ethnicity	White	1.00		1.00	
	BME	1.93	(1.56, 2.39)	1.56	(1.26, 1.92)

BME Black or minority ethnic group

Antenatal education

In the UK, women are given information and a registration form for antenatal classes at the time of booking. However, there has been a substantial decline in NHS (free) provision of antenatal classes.(31) It was postulated that worry about labour might be reduced in women who had attended antenatal education. Half of primiparous but only 9% of multiparous women attended NHS antenatal classes, a further 23% of primiparous and 5% of multiparous women attended non-NHS classes for which they paid. For *primiparous women only*, there was a strong association between being unable to attend NHS classes, either because they were not offered or because they were

booked up, and feeling 'very worried' about not knowing when labour would start (but not about getting to hospital in time). After adjustment for age, ethnicity and IMD, women who did not have access to antenatal classes had an Odds ratio of 1.58 (95% confidence interval 1.10-2.25) of being very worried about not knowing when labour would start. BME women were significantly less likely to attend antenatal classes due to not being offered them or them being booked up. However, those BME women who *did* attend classes were no less likely to be worried about these aspects of early labour. These data are shown in Supplementary data.

Table 5 – Binary logistic regression showing combined effects of sociodemographic factors on experience of contacting midwife or hospital in early labour

		Contacted HCP at start of labour		Received appropriate advice		Asked to come into hospital	
		OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Maternal age (years)	<20	0.87	(0.39, 1.90)	0.55	(0.28, 1.05)	1.51	(0.79, 2.86)
	20-24	1.40	(0.90, 2.19)	0.57	(0.40, 0.81)	0.95	(0.70, 1.30)
	25-29	1.27	(0.93, 1.73)	0.87	(0.65, 1.16)	1.08	(0.86, 1.35)
	30-34	1.00		1.00		1.00	
	35-39	0.97	(0.71, 1.34)	1.17	(0.82, 1.67)	0.93	(0.72, 1.21)
	40+	0.56	(0.33, 0.96)	2.70	(0.96, 7.58)	0.77	(0.47, 1.28)
Parity	Primiparous	1.00		1.00		1.00	
	Multiparous	0.59	(0.46, 0.75)	1.24	(0.98, 1.58)	1.63	(1.35, 1.96)
Index of multiple deprivation	1 (least deprived)	1.00		1.00		1.00	
	2	0.75	(0.52, 1.09)	0.84	(0.58, 1.21)	1.09	(0.82, 1.45)
	3	0.95	(0.65, 1.39)	0.99	(0.68, 1.43)	1.11	(0.84, 1.47)
	4	0.70	(0.49, 1.02)	0.95	(0.66, 1.38)	1.34	(1.01, 1.79)
	5 (most deprived)	0.91	(0.60, 1.36)	0.88	(0.60, 1.29)	1.23	(0.91, 1.66)
Ethnicity	White	1.00		1.00		1.00	
	BME	1.39	(0.98, 1.99)	0.89	(0.65, 1.23)	1.00	(0.77, 1.29)

BME Black and minority ethnic group HCP Health care professional

Qualitative results

Fifty-nine women wrote free-text comments relating to early labour. Table 6 shows the characteristics of these women compared to survey respondents overall. They were

disproportionately older, primiparous, more educated and resident in the least deprived quintiles but none of the differences was statistically significant. Table 7 shows the main themes that arose from the free-text comments relating to early labour. These were '*Differentiating between early and active labour*', '*Staff attitudes*', '*Not being allowed…*', '*Previous labours*', and '*Perceived consequences for women*'. Individual quotations are used to illustrate these themes.

Table 6 – Sociodemographic characteristics of women who wrote free-text comments relating to early labour compared to all respondents

		Women who wrote free-text comments relating to early labour		All women who completed the questionnaire	
		N	%	N	%
Maternal age (years)	16-24	7	11.9	640	14.0
	25-34	22	37.3	2818	61.6
	35 or more	30	50.8	1118	24.2
	Total	59	100	4576	100
Parity	Primiparous	32	56.1	2207	49.8
	Multiparous	25	43.9	2223	50.2
	Total	57	100	4430	100
Ethnicity	White	49	84.5	3715	83.9
	BME	9	15.5	713	16.1
	Total	58	100	4428	100
Index of multiple deprivation	1 (least deprived)	15	25.4	901	19.7
	2	12	20.3	867	18.9
	3	13	22.0	935	20.4
	4	9	15.2	978	21.4
	5 (most deprived)	10	16.9	896	19.6
	Total	59	100	4577	100
Left FT education aged <16 years		6	10.3	757	16.9
Left FT education aged 16 years or more		53	89.7	3727	83.1
	Total	59	100	4484	100

BME Black and minority ethnic group; FT full time

Differentiating between early and active labour

Women understood that to be credible and viewed by midwives as genuinely in labour, they had to meet certain criteria regarding frequency and duration of contractions. However, not all women in active labour met these criteria:

Contractions started on a Weds, had the baby on a Saturday. Kept ringing the maternity ward to be told not to come in until I was 3-10-1 (3 contractions in 10 minutes, lasting 1 minute each). That isn't going to apply to everyone and [one] should be invited into hospital. [Primip, IMD1, 25-29 yrs, white]

Went into hospital in labour 3 min contractions and sent home again as only 1.5 cm dilated - less than 2 hours later I gave birth, crowning in the hospital car park, head out in the elevator. This was very traumatic and wish they allowed me to stay instead of stranding me at home. [Primip, IMD5, 30-34 yrs, white]

Women also reported that midwives judged from their voice and behaviour whether they were in active labour. Some women therefore deliberately 'acted' the part:

When we went into labour with this baby, I phoned the hospital twice and both times they said I didn't sound like I was in labour and suggested I stay at home, […] They made us feel a bit silly for coming into hospital, as I wasn't "screaming and shouting", they assumed I was only in early labour. [Multip, IMD3, 35-39 yrs, white]

[…] After my husband lied to the hospital about the time between contractions I was eventually told to come in. Although my waters hadn't broken I was already 6 cm dilated. [Primip, IMD2, 30-34 yrs, white]

Table 7 – Main themes and examples arising from the qualitative analysis

Themes	Sub-themes	Examples
Assumptions about identifying active labour	'Rules' about contractions Behaviour of women in active labour Having to pretend/exaggerate about contractions	*[…] Called hospital 9 hours later, told midwife I had urge to push, still advised to stay home due to contraction frequency. Felt very uncomfortable, husband called 999, waters broke as soon as ambulance came and I began pushing at home. Decided to go to hospital by ambulance, baby born shortly after arrival. [Primip, IMD1, 25-29 yrs, white]*
Staff attitudes	Insensitive, rude, abrupt, dismissive, negative response Being made to feel foolish Feeling vindicated – women in active labour not early labour as staff had thought Received inappropriate advice: stay home, have bath, take paracetamol	*I was distressed during my labour as one of the midwives was very patronising in telling me that my contractions weren't as painful as I was experiencing, she sent me home twice. [Primip, IMD5, 30-34 yrs, BME]*
Not being allowed…	To come in, to stay – sent home, unit busy Be examined/checked Having to beg for VE	*I felt quite pushed back from the hospital when I phoned. I was bleeding (my show) and having regular pains but I just got told to stay at home and if I went through they would just send me away. [Primip, IMD5, 20-24 yrs, BME]*
Previous labours	Primiparous women needing reassurance, being uncertain Multiparous women having experience, recognising active labour, being dismissed	*When I went into labour with my 3rd child I called the labour ward and wanted to come into hospital but they wouldn't let me. I didn't feel like she was listening to me even though I said I labour quickly.*
The consequences for women	Rushed delivery - insufficient time for preparation & pain relief Not a normal birth - Instrumental/operative delivery Upset - distress, delayed attachment to baby	*[…] Felt unhappy as hadn't had chance for pain relief option and baby had become distressed. Felt that I should have been kept in hospital when first went in or made to feel more welcome on phone. Not the way I wanted my labour to be and was worrying for me and my husband. [Primip, IMD1, 25-29 yrs, white]*

Staff attitudes

Many women perceived negative staff attitudes both on the phone and when attending the unit for assessment. Women were made to feel foolish by midwives who were insensitive, rude, abrupt and dismissive:

> *[...] I had to scream/cry down the phone before she abruptly told me "you better come in then" not a pleasant experience. [Multip, IMD3, 30-34 yrs, white]*

Another common sub-theme was women feeling vindicated, the midwife having assumed that they were not in active labour, but upon examination, they were close to full dilatation:

> *I knew I was further along than they assumed and insisted on an exam where they discovered I was 6cm and baby came 3 hours later! [Multip, IMD3, 35-39 yrs, white]*

> *Eventually I rang back to say I want to come in to be checked over only to be told "well you will probably end up going home anyway". [...] Would like to point out when arrived at hospital when I was checked over I was 9 cm. [Primip, IMD1, 25-29 yrs, white]*

Not being allowed…

Women reported not being allowed to come into hospital, not being allowed to stay, and in a few cases, having to beg for a vaginal examination. This made them more anxious as they felt that hospital was a safer place than home:

> *Labour was slow so kept getting told to stay at home - that was very distressing and made me more anxious. [Primip, IMD3, 25-29 yrs, BME]*

> *Crying out in pain and begging for midwife to check over/do internal to see how dilated. Only then discovered 6/7 cm dilated and wheeled in wheelchair to labour ward. [Primip, IMD1, 25-29 yrs, white]*

In addition, some women reported that staff did not take account of their travel time, necessitating several lengthy and uncomfortable journeys:

My waters broke 11.30pm - phoned hospital told to go in […] Got told to go home as it was my 1st baby - told to look out for contractions […] by 7am I was in pain - phoned hospital told to go back in - my 3rd 40 min journey - when I got to hospital - got told I was in the very early stages of labour - not checked at all and got told to go home […] Got home - another 40 min journey. Started bleeding was being sick and in pain - phone hospital again and got told to go back AGAIN […] When I got to the hospital, I couldn't walk […] Got to the labour ward on the 6th floor - told I was fully dilated and the head was there […] [Primip, IMD3, 35-39 yrs, white]

The above quote also illustrates a sub-theme of 'Not being checked' which was reported by several women and was associated with delay in diagnosis of active labour and inappropriate management:

[…] labour started naturally at 1am. I informed the midwife at 5am but she refused to believe I was in established labour. By the time I convinced her to check me at 7:45am, I was 9cm dilated and baby was born within next ten mins. The lesson to be learnt is that some midwives will only take you seriously if you are screaming in pain. [Multip, IMD4, 25-29 yrs, ethnicity missing]

Previous labours

Some midwives were reportedly unwilling to take account of parity in assessing whether a woman was in early or active labour. Primiparous women clearly need more support and reassurance:

Being my first pregnancy when I went into labour I was unsure. […] I feel for first time mums - a little more understanding at the hospital that we don't know what our bodies are doing would help. [Primip, IMD2, 30-34 yrs, white]

Multiparous women who had experienced labour before are likely to recognise the different stages and sometimes reported not being listened to. Advice to other women included *"you know your body"* and *"trust your instincts".*

[…] My husband was told to leave and I was transferred to a ward. I was still having contractions but told it would be ages until active labour. I explained my contractions were always irregular

but once pain increased the 2nd stage would be very quick [...] My husband was still told to go home. After he left I started having more painful contractions and called for the midwife. She checked me and thought active labour had started and went to call the labour ward. I had to call her back 5 minutes later as I needed to start pushing. I called my husband but he did not get there in time. It was a very scary experience as there was no equipment in the room to deliver the baby (as it was a normal antenatal ward) […] [Multip, IMD3, 30-34 yrs, BME]

When I went into labour with my 3rd child I called the labour ward and wanted to come into hospital but they wouldn't let me. I didn't feel like she was listening to me even though I said I labour quickly. By the time I got to hospital I was in too much pain to have IV's [for Group B strep]. If I'd gone into hospital when I wanted to then I would have had pain relief sooner and would have received the antibiotics. [Multip, IMD5, 35-39 yrs, white]

Perceived consequences for women

Many of the women who had felt let down by staff in early labour, having to stay at home when they wanted to be in hospital, went on to report a failure to get appropriate pain relief and medication (as in the previous quote), a rushed, sometimes operative, delivery, feelings of shock and delayed attachment to their baby:

My labour was a bit stop-start and the unit suggested I didn't come in until the contractions were every 3 mins and at least 1 minute in duration. I don't feel this was the right advice for me and regret not going to get checked out as I think if I had gone in after my contractions were about 5 minutes, I may have had a natural birth rather than C-section. However, the care I received was excellent other than that. [Primip, IMD2, 25-29 yrs, white]

[…] My baby's head was already out by the time the midwife arrived in the room. I had to have my baby standing up as there was not time to get on the bed. I was in complete shock when my baby was born due to this and I did not feel the immediate rush of love for my baby because I was in too much shock and pain. [Multip, IMD3, 30-34 yrs, white]

Some women ascribed their poor experiences to staff shortages or the facilities being particularly busy:

> *They [staff] were horribly rushed, kept saying things would happen that didn't happen, didn't pass information between colleagues, and didn't give us consistent information. It was clear that they were horribly overworked and were dealing with people in more priority than me. I feel confident that I would have got more attention had I been higher priority (I wasn't at risk) but it was an unpleasant experience where I felt powerless and confused for a lot of the time … [Primip, IMD2, 30-34 yrs, white]*

All the free-text comments relating to early labour were negative so it was not possible to estimate the association between qualitative comments and the quantitative measure of satisfaction with care during labour and birth. However, among women who wrote a free-text comment relating to early labour, only 32.1% were very satisfied with their care at this time compared to 62.8% in the whole sample. The proportions who were very dissatisfied were 7.1% and 2.3% respectively. Similarly, whilst 84% of women overall felt that they received appropriate advice when they phoned a midwife in early labour, only 36% of women who wrote free-text comments considered the advice appropriate.

DISCUSSION

The findings of this study suggest that there is considerable variation in women's experience of early labour by sociodemographic characteristics. Although the differences by parity are to be expected, the significantly increased worry among BME women is more surprising. However, it confirms the findings of a previous study which found that ethnic minority women were more likely to report high levels of worry about almost all aspects of birth, irrespective of parity and residence in an area of deprivation.(32) After adjusting for parity, ethnicity and IMD, women aged 20-24 years were also more likely to be worried about not knowing when labour would start and, again, this is consistent with earlier research.(22) Women in this age group were also significantly less likely to feel that they

received appropriate advice when they phoned a midwife or the hospital. This may reflect a perception in this group that they are viewed as problematic and immature by health care professionals.(33)

Primiparous women who were not able to attend NHS antenatal classes, either because they were not offered or because they were booked up, were significantly more likely to be very worried about not knowing when labour would start. This finding persisted after adjustment for sociodemographic characteristics. This is consistent with the findings of a Danish randomised controlled trial which found that antenatal education in small groups increased women's confidence in their ability to cope at home during labour.(34) However, the women who were unable to access NHS antenatal education in the current study were also significantly less likely to have planned their pregnancy or to have booked before 10 weeks. Thus, they may have been more worried generally.

The free-text comments relating to women's experience of early labour were entirely negative. This partly reflects the propensity for respondents to write additional comments when they have an issue about which they would like to comment or complain.(29) To put it into context, over three-quarters of women contacting a midwife or hospital at the start of labour reported receiving appropriate advice but the corresponding proportion for women who wrote free-text responses on this topic was just over a third. The main themes related to women's perceptions of staff assumptions and attitudes, and not being allowed to come to hospital or stay, and these resonate strongly with earlier studies.(2, 16-18, 20, 35) In particular, the study by Spiby et al (2014)(20) used focus groups to understand the views of UK midwives dealing with women in early labour. They found that some midwives held negative perceptions and stereotypes of women and labelled them accordingly. Studies which analysed this subject from women's perspectives underscored the importance to women of arriving at the hospital at the 'right time', the distress associated with being sent home, and the impact of having a caring or uncaring midwife, of being believed.(2, 16) The neglect felt by

some women at this time echoes the results of a study of women's experience of the early phase of induction of labour.(36)

The other two themes that arose in this study related to parity and the perceived consequences for women of poor early labour care. Parity is not mentioned in the literature although some studies only included primiparous women.(12, 14, 17, 18) In this study, the issues facing primiparous and multiparous women differed: primiparous women wanted more support and reassurance whereas multiparous women, having already experienced labour, remembered how it felt and were sometimes angry at not being believed. Some women perceived negative consequences resulting from inaccurate diagnosis of labour. These included a lack of time for pain relief, medication and a perception of delayed attachment to their baby, also women who thought that an operative delivery may have been avoided had early labour been better managed. Although this latter outcome has been demonstrated to result from admission in early labour,(1, 2) no qualitative studies have reported on this.

A strength of this study is that it was based on a large random sample of births in England and uses both quantitative and qualitative data from the same primiparous and multiparous women. Limitations include the 47% response rate with under-representation of young women, those born outside the UK, and women resident in deprived areas.(27) However, 16% of respondents were BME, 17% left full-time education aged 16 years or less, 20% were resident in the most deprived quintile, and 13% did not have a partner at the time of the survey. Similarly, the free-text comments were disproportionately from primiparous, more educated women, and those resident in the least deprived quintile. However, qualitative research aims to be transferable rather than generalisable and the characteristics of women who wrote free-text comments are shown in Table 6. Moreover, the findings are consistent with those of other studies and the numbers of women, even in minority groups, are substantial. A further limitation of the quantitative data is that they are entirely based

on women's perception and recall of events, which may be inaccurate. However, recall of salient events in childbirth is generally good.(37, 38)

Conclusions and implications for practice

These findings reinforce those of other studies stressing the importance of providing reassurance to women in early labour, taking care that women do not feel neglected or dismissed. In particular, young primiparous women and those from minority ethnic groups report greater worry about aspects of early labour than other women and require additional reassurance. Whilst most women who are not contracting strongly and regularly can be reassured that they can safely stay at home, some women labour very rapidly. The Norwegian midwives cited in the study by Eri et al (2011)(19) recommended that women come into hospital to be assessed and to see how their labour progresses. If they are not in active labour, they can then decide for themselves that they would be more comfortable at home and feel confident in going home.(19) A standalone triage unit for women in early labour, separate from the labour ward, would not be influenced by the workload there and could help women to have a more positive experience of early labour. This model may require additional resources to set up, but if it helps women to come into hospital in active labour, it may save resources overall.

Antenatal education may have a role in improving women's and partners' knowledge and confidence in coping at home but a recent systematic review reported a lack of good evidence as to its effectiveness in promoting good obstetric and psychosocial outcomes more generally.(39) The maternity services should consider whether women's information needs are being met.

In summary, most women were not particularly worried about early labour and most of those who contacted a midwife at this time felt that they received appropriate advice. However, some women clearly felt that their care at this time had been poor suggesting that this is an area where improvements could be made.

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COMPETING INTERESTS

The authors declare that they have no competing interests.

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AUTHORS' CONTRIBUTIONS

JH initiated this study, conducted the analyses and drafted the manuscript. MR was the principal investigator for women's surveys and helped direct the analysis. Both authors revised the manuscript.

DATA SHARING STATEMENT

Further analyses of these data are planned so data will not be shared until these are completed.

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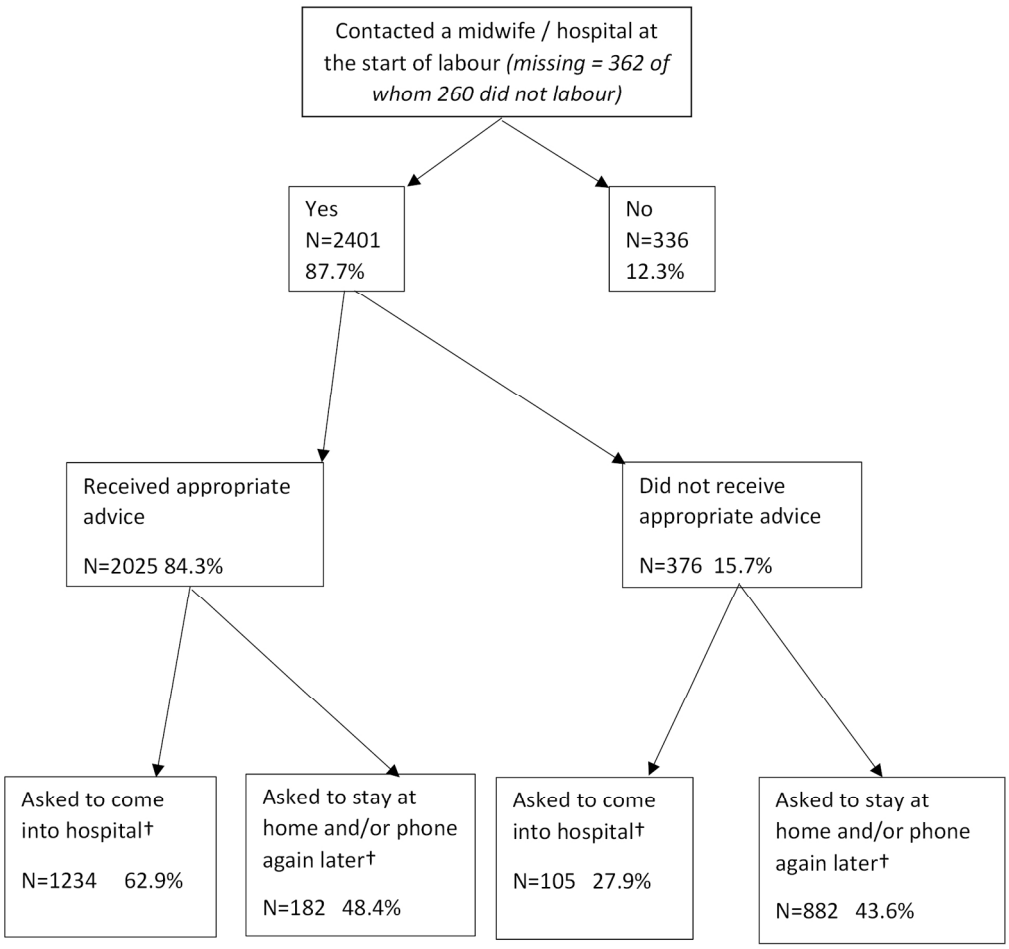
Figure 1 – Numbers and proportions of women contacting midwife or hospital at the start of labour and resulting care (of the 3099 women who had neither induction of labour nor a planned caesarean section before the start of labour)



† Not exclusive categories

Figure 1 – Numbers and proportions of women contacting midwife or hospital at the start of labour and resulting care (of the 3099 women who had neither induction of labour nor a planned caesarean section before the start of labour)

163x180mm (300 x 300 DPI)

Supplementary data on antenatal education

	Offered AN classes		Attended NHS classes								Paid for AN classes	
			Yes		No, booked up		No, not offered		Not wanted			
Maternal age (years)	N	%	N	%	N	%	N	%	No.	%	N	%
<20	57	73.1	20	25.6	4	5.1	14	17.9	28	35.9	0	0.0
20-24	240	68.0	97	28.0	13	3.8	75	21.7	115	33.2	11	3.2
25-29	586	70.3	289	35.1	15	1.8	165	20.0	235	28.6	82	9.9
30-34	700	64.0	314	29.4	19	1.8	266	24.9	315	29.5	200	18.4
35-39	342	59.6	144	25.9	10	1.8	149	26.8	163	29.3	106	18.5
40+	61	52.1	23	21.3	2	1.9	35	32.4	30	27.8	19	16.4
Total	1986	65.1 ***	887	29.8	63	2.1	704	23.6	886	29.7 **	418	13.8 ***
Parity												
Primiparous	1218	83.5	725	50.0	43	3.0	158	10.9	286	19.7	336	23.1
Multiparous	717	47.4	130	9.0	18	1.2	531	36.6	582	40.1	72	4.8
Total	1935	65.2 ***	855	29.5	61	2.1	689	23.7	868	29.9 ***	408	13.8 ***
Index of multiple deprivation (quintiles)												
1 (least deprived)	393	66.2	176	30.0	10	1.7	137	23.4	160	27.3	129	21.9
2	421	70.6	190	33.0	14	2.4	113	19.6	165	28.6	112	19.0
3	408	65.6	202	33.3	13	2.1	149	24.5	161	26.5	86	14.0
4	410	63.2	181	28.7	12	1.9	154	24.4	202	32.0	63	9.7
5 (most deprived)	353	59.9	138	23.8	14	2.4	151	26.0	198	34.1	28	4.8
Total	1985	65.1 **	887	29.8	63	2.1	704	23.6	886	29.7 **	418	13.8 ***
Black or minority ethnic group												
No	1656	66.8	736	30.5	46	1.9	558	23.1	732	30.3	366	14.9
Yes	282	57.9	125	25.9	14	2.9	131	27.1	130	26.9	45	9.3

Total	1938	65.4 ***	861	29.7	60	2.1	689	23.8	862	29.7 *	411	14.0 **

Missing values: Offered AN classes 48; Attended AN classes 118; Paid for private classes 69

Association between worry about aspects of early labour and attendance at antenatal classes (Primips only)

	Attended AN classes		**Classes all booked up or not offered**		**Did not wish to attend or did not attend for other reason**	
	No.	%	No.	%	No.	%
Very worried about not knowing when labour would start (p=0.002)	136	12.4	57	19.8	90	12.3
Very worried about getting to hospital in time (NS)	94	8.5	35	12.3	68	9.3

Logistic regression on feeling very worried about not knowing when labour would start adjusted for age, IMD, and ethnicity	**OR (95% CI)**
Attended AN classes	1
Classes all booked up or not offered	1.58 (1.10, 2.25)
Did not wish to attend or did not attend for other reason	0.94 (0.70, 1.26)

STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No	Recommendation	Page
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4-6
Objectives	3	State specific objectives, including any prespecified hypotheses	6
Methods			
Study design	4	Present key elements of study design early in the paper	6
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	6
Participants	6	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants	6
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed *Case-control study*—For matched studies, give matching criteria and the number of controls per case	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6-7
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	6-7
Bias	9	Describe any efforts to address potential sources of bias	7
Study size	10	Explain how the study size was arrived at	6
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	7
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	7
		(*b*) Describe any methods used to examine subgroups and interactions	
		(*c*) Explain how missing data were addressed	
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed *Case-control study*—If applicable, explain how matching of cases and controls was addressed *Cross-sectional study*—If applicable, describe analytical methods taking account of sampling strategy	
		(*e*) Describe any sensitivity analyses	

Continued on next page

Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	7-8
		(b) Give reasons for non-participation at each stage	
		(c) Consider use of a flow diagram	Fig 1
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	Tables 1-3
		(b) Indicate number of participants with missing data for each variable of interest	
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)	
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time	
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	
		Cross-sectional study—Report numbers of outcome events or summary measures	Tables 1-3
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	Tables 4-5
		(*b*) Report category boundaries when continuous variables were categorized	
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	
Discussion			
Key results	18	Summarise key results with reference to study objectives	20
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	22
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	20-22
Generalisability	21	Discuss the generalisability (external validity) of the study results	22
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	23

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

BMJ Open

Sociodemographic differences in women's experience of early labour care: a mixed methods study

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Sociodemographic differences in women's experience of early labour care: a mixed methods study

Jane Henderson BSc(Hons) MSc PhD*

Maggie Redshaw BA PhD CPsychol

Policy Research Unit in Maternal Health and Care,

National Perinatal Epidemiology Unit,

Nuffield Department of Population Health,

University of Oxford,

Old Road Campus,

Old Road,

Oxford, UK

* Corresponding author

Tel: 01865 289758; Fax: 01865 289701

Email: jane.henderson@npeu.ox.ac.uk

Email: maggie.redshaw@npeu.ox.ac.uk

Word count: 4850

Abstract

Objectives: To explore women's experiences of early labour care focussing on sociodemographic differences, and to examine the effect of antenatal education, using mixed methods.

Setting: England, 2014.

Participants: Women who completed postal questionnaires about their experience of maternity care, including questions about antenatal education, early labour and sociodemographic factors, included space for free-text comments.

Outcome measures: Worries about labour, contact with midwives in early labour and subsequent care.

Methods: This study was based on secondary analysis of a national maternity survey carried out in England in 2014. Quantitative data were analysed using descriptive statistics and binary logistic regression, qualitative data were analysed using a thematic content analytic approach.

Results: Completed questionnaires were received from 4578 women (47% response rate). There were significant differences by sociodemographic factors, particularly ethnicity, in women's worries about early labour. Compared to White women, women from Black or minority ethnic groups had an adjusted Odds ratio of 1.93 (95% confidence interval 1.56, 2.39) of feeling worried about not knowing when labour would start. Among women who contacted a midwife at the start of labour, 84% perceived their advice as appropriate, more in older and multiparous women. Overall, 64% of women were asked to come in to hospital at this time, more in multiparous women (adjusted Odds ratio 1.63, 95% confidence interval 1.35, 1.96). Those who did not have access to antenatal education experienced greater worry about early labour. Five themes emerged from the qualitative analysis: '*Differentiating between early and active labour*', '*Staff attitudes*', '*Not being allowed…*', '*Previous labours*', and '*Perceived consequences for women*'.

Conclusions: These findings reinforce the importance of providing reassurance to women in early labour, taking care that women do not feel neglected or dismissed. In particular, primiparous and ethnic minority women reported greater worry about early labour and require additional reassurance.

Article summary

Strengths and limitations of the study

- Large study based on random sample of birth registrations in England.
- Both quantitative and qualitative data from women relating to early labour.
- Response rate of 47% makes generalisation difficult.
- Respondents, especially those who wrote free-text comments, predominantly primiparous, educated, and resident in less deprived areas.

INTRODUCTION

Early labour, also known as the latent phase, has been defined in a number of different ways but the National Institute for Health and Clinical Excellence (NICE) defines it as a period of time when there are painful contractions and some cervical change.(1) Early labour is usually a slow process during which women may feel distress and anxiety, and lose confidence in their ability to cope.(2) The resulting stress hormones may counter the effects of oxytocin and slow the progress of labour(3) resulting in further anxiety and distress.

Many observational studies have noted that admission to hospital prior to active labour increases the risk of oxytocin augmentation, epidural analgesia and caesarean section.(4-9) Health professionals therefore strongly recommend to women that they stay home as long as possible, until contractions are as frequent as three in ten minutes. This cut-off is based on a graphic approach developed by Friedman in the 1950s.(10) However, for women, the negative effects of staying at home in pain include confusion, anger and resentment, feeling neglected, unsupported and anxious.(2) It has been estimated that between 30% and 45% of women are admitted to hospital prior to active labour.(11, 12)

A randomised trial of an intervention providing additional support to women at home during early labour resulted in more admissions in active labour, reduced use of analgesia, reduced neonatal morbidity, and increased maternal satisfaction although emotional wellbeing and distress did not differ between the groups.(12) Other studies have found no significant benefit associated with structured care involving one-to-one care, positioning techniques, and positive imagery in early labour,(13) or use of an algorithm for defining active labour based on presence of painful, regular, moderate or strong contractions and either cervical effacement and dilation of at least 3cm, spontaneous rupture of membranes, or a 'show'.(14)

Several studies have used qualitative techniques to examine women's views and experience of care in early labour.(15-18) The findings of these studies reflect women's uncertainty and anxiety about

presenting at hospital at the right time, worry about being sent home if they arrive too early, their need for validation, the pressure as well as support provided by friends and family, surprise and consternation regarding the intensity of pain in early labour, and fatigue resulting in reduced ability to cope. Other qualitative studies have examined the care of women in early labour from the midwives' perspective.(19, 20) These stress the importance of providing reassurance to the woman and her family and normalising the situation. However, they differed in overall paradigm which may reflect differences in the organisation of care in Norway and the UK. The Norwegian study(19) acknowledged that some women labour quickly and clinical judgement on the phone is necessarily limited. These midwives believed that it was best for women to come to hospital for assessment if they wished and then to feel sufficiently informed and empowered to make the decision to return home if they were not in active labour. In contrast, the midwives in the UK study(20) stressed the importance of the midwives' role as 'gatekeeper' acknowledging that they had different priorities from the women. They reported that they could tell from a woman's voice, or through intuition, whether she was in active labour. Moreover, some midwives used trivialising language to describe women in early labour such as 'frequent flyers'. They acknowledged that although labour ward workload should not take precedence over women's experience, it often did.(20)

Only one study used quantitative techniques to explore women's experience of early labour.(17) They reported that 46% of women were aware of the expectation that they would stay at home during early labour, and that being made to feel unwelcome, not being treated with respect or as an individual were associated with feeling dissatisfied with care in early labour. This was exacerbated if they were sent home more than once without follow-up arrangements being made, or felt discouraged from returning, especially if they felt that this was due to the unit being busy rather than it being clinically appropriate.

No studies have examined the early labour experiences of women from different sociodemographic groups although evidence from other studies suggests that women from more disadvantaged groups

have poorer experience of maternity care.(21-26) The aims of this study were therefore (i) to explore the experiences of early labour care, both quantitatively and qualitatively, among women with different sociodemographic characteristics, and (ii) to determine whether women who attended antenatal education were less worried about early labour and less likely to go to hospital early.

METHODS

This study involved secondary analysis of a national maternity survey carried out in England in 2014.(27) Ten thousand women were randomly selected from birth registration statistics by staff at the Office for National Statistics (ONS) excluding those aged less than 16 years and those whose baby had died. The questionnaire, together with a letter, information leaflet, and a sheet with a single sentence in 18 non-English languages (providing a Freephone number for an interpreter), encouraged women to complete the questionnaire and return it in a Freepost envelope. These were sent to women at three months postpartum. The questionnaire could also be completed online. Using a tailored reminder system, up to three reminders were sent as required.

A mixed methods design was used with the questionnaire including both closed and open questions. Women were asked about their experience of maternity care including early labour, and also asked questions about sociodemographic characteristics and whether they attended antenatal classes. Using a validated worries checklist they were asked a range of questions, including if, before labour started, they were worried about not knowing when they would go into labour, and about getting to the hospital in time (answer options: very, quite, not very, not at all worried).(28) Women who had a labour were asked if they contacted a midwife or the hospital at the very start of their labour, and if so, whether they felt that they were given appropriate advice and support. If they had contacted a midwife or the hospital, they were asked about the response, that is, whether they were asked to come into the hospital, stay at home, wait and phone again, or phone again if worried. We have considered this as early labour care although we acknowledge that it may have also included women in active labour. All data were necessarily based on women's perception and recall of events.

There was space for free-text comment at the point in the questionnaire relating to early labour and at the end. Women were also asked what they would like to tell other women about having a baby in that hospital or unit. These free-text comments were the sole source of qualitative data.

ONS provided information about each woman's age group, country of birth, marital status, and an area based measure, the Index of Multiple Deprivation (IMD) in quintiles, which enabled comparison of responders and non-responders. In this study, IMD, ethnicity (White vs. Black or minority ethnic group (BME)), maternal age in six categories, and parity (primiparous vs. multiparous) were included as sociodemographic variables. Women who had an induction of labour or caesarean planned and carried out before labour were excluded from the analysis.

A descriptive analysis was carried out using raw percentages to establish how sociodemographic groups' experiences differed in their worries about early labour, whether they contacted a health care professional in early labour and received appropriate advice. Differences were tested using the chi-square statistic. As there was likely to be overlap between different sociodemographic factors, binary logistic regression was used to estimate the extent of this, to determine the main drivers for any differences seen, and to test the effect of antenatal education. Binary logistic regressions were adjusted for each of the sociodemographic variables. All quantitative analyses were carried out in Stata version 13.

Free-text responses to the questions relating to care in early labour and at the end of the questionnaire were analysed following the method of Garcia et al (2004).(29) Responses were filtered using the keywords 'early', 'latent', 'sent home', 'come/came back', and 'return' then read and selected if they referred to early labour. Comments were read and coded in an iterative process by both authors, coding themes as they arose using a thematic content analytic approach. Where differences in interpretation arose these were resolved by discussion and reference to the raw data. Deviant cases were sought, and triangulation with quantitative data on satisfaction was used to test the credibility and trustworthiness of the findings.(30)

Ethical approval for the survey was obtained from the NRES committee for Yorkshire and The Humber – Humber Bridge (REC reference 14/YH/0065). Written informed consent from participants was not considered necessary; consent was implicit in completion and return of the questionnaire.

RESULTS

Completed questionnaires were received from 4578 women representing a 47% usable response rate. Of these 398 had a planned caesarean section carried out before labour had started, and 1081 had an induction of labour. These were excluded from the analyses leaving 3099 women. These were 49% primiparous, 83% White, and 42% aged 30 years or more. Compared to non-respondents, women who completed the questionnaire were significantly more likely to be older, married, living in a less deprived area and born in the UK.(27)

Quantitative results

The descriptive statistics shown in Table 1 indicate considerable differences in women's worries about early labour and in their care at this time. Worry about knowing when labour would start was significantly greater in primiparous women and those from BME groups. Worry about getting to hospital in time was significantly greater in multiparous women and, again, those from BME groups.

Overall, 88% of women contacted a midwife or the hospital at the start of labour (Table 2). This was significantly less likely in women ages 40 years or more and in multiparous women. Overall, 84% of women reported receiving appropriate advice at this time, with significantly more reporting this among older and multiparous women. Women were more likely to consider the advice appropriate if it included coming into hospital (Figure 1). Overall, two-thirds of women were eventually asked to come in to the hospital to be assessed, but 48% were at some point asked to stay at home and phone again later. This latter was significantly more common in primiparous women (Table 3).

Table 1 – Sociodemographic characteristics of women with worries about early labour

	Worry about knowing when labour would start (Missing=106)					Worry about getting to hospital in time (Missing=112)				
	Very/quite worried		Not very/at all worried			Very/quite worried		Not very/at all worried		
	No.	%	No.	%		No.	%	No.	%	
Maternal age (years)										
<20	40	51.9	37	48.1		54	69.2	24	30.8	
20-24	159	46.2	185	53.8		209	60.6	136	39.4	
25-29	441	53.3	386	46.7		510	61.6	318	38.4	
30-34	579	54.0	494	46.0		673	62.9	397	37.1	
35-39	298	53.2	262	46.8		338	61.1	215	38.9	
40+	61	55.0	50	45.0		71	63.4	41	36.6	
Total	1578	52.7	1414	47.3		1855	62.1	1131	37.9	
Missing=1										
Parity										
Primiparous	713	49.3	733	50.7		944	65.4	499	34.6	
Multiparous	834	56.7	637	43.3		866	59.1	600	40.9	
Total	1547	53.0	1370	47.0	***	1810	62.2	1099	37.8	***
Missing=104										
Index of multiple deprivation (quintiles)										
1 (least deprived)	322	55.0	263	45.0		370	63.4	214	36.6	
2	315	54.1	267	45.9		367	62.8	217	37.2	
3	329	53.8	282	46.2		381	62.7	227	37.3	
4	317	49.3	326	50.7		389	60.6	253	39.4	
5 (most deprived)	296	51.8	275	48.2		348	61.3	220	38.7	
Total	1579	52.8	1413	47.2		1855	62.1	1131	37.9	
Missing=1										
Black or minority ethnic group										
No	1341	55.0	1098	45.0		1557	63.7	886	36.3	
Yes	195	41.0	281	59.0		251	53.3	220	46.7	
Total	1536	52.7	1379	47.3	***	1808	62.0	1106	38.0	***
Missing=109										

** p<0.05 ** p<0.01 *** p<0.001*

Table 2 – Sociodemographic characteristics of women contacting a health professional at the start of labour

	Contacted a MW/hospital at start of labour					Received appropriate advice				
	Yes		No			Yes		No		
	No.	%	No.	%		No.	%	No.	%	
Maternal age (years)										
<20	60	87.0	9	13.0		45	75.0	15	25.0	
20-24	294	91.0	29	9.0		224	76.2	70	23.8	
25-29	699	90.3	75	9.7		588	84.1	111	15.9	
30-34	846	86.6	131	13.4		722	85.3	124	14.7	
35-39	430	85.7	72	14.3		379	88.1	51	11.9	
40+	71	78.0	20	22.0		66	93.0	5	7.0	
Total	2400	87.7	336	12.3	**	2024	84.3	376	15.7	***
Parity										
Primiparous	1199	90.8	122	9.2		988	82.4	211	17.6	
Multiparous	1139	84.6	207	15.4		985	86.5	154	13.5	
Total	2338	87.7	329	12.3	***	1973	84.4	365	15.6	**
Index of multiple deprivation (quintiles)										
1 (least deprived)	475	88.8	60	11.2		411	86.5	64	13.5	
2	469	86.4	74	13.6		391	83.4	78	16.6	
3	496	89.0	61	11.0		422	85.1	74	14.9	
4	496	86.1	80	13.9		418	84.3	78	15.7	
5 (most deprived)	464	88.4	61	11.6		383	82.5	81	17.5	
Total	2400	87.7	336	12.3		2025	84.4	375	15.6	
Black or minority ethnic group										
No	1969	87.4	285	12.6		1661	84.4	308	15.6	
Yes	375	89.7	43	10.3		314	83.7	61	16.3	
Total	2344	87.7	328	12.3		1975	84.3	369	15.7	

** p<0.05 ** p<0.01 *** p<0.001*

Table 3 – If midwife or hospital contacted in early labour, woman asked to come in or stay home

	If contacted MW: stay home/phone again					If contacted MW: come in to hospital				
	Yes		No			Yes		No		
	No.	%	No.	%		No.	%	No.	%	
Maternal age (years)										
<20	25	49.0	26	51.0		37	71.2	15	28.8	
20-24	141	54.7	117	45.3		155	62.2	94	37.8	
25-29	334	51.2	318	48.8		404	64.2	225	35.8	
30-34	375	47.7	411	52.3		495	63.7	282	36.3	
35-39	175	43.3	229	56.7		256	63.5	147	36.5	
40+	27	39.7	41	60.3		42	60.0	28	40.0	
Total	1077	48.5	1142	51.5	*	1389	63.7	791	36.3	
Parity										
Primiparous	641	57.6	472	42.4		617	58.8	433	41.2	
Multiparous	405	38.6	644	61.4		740	68.8	335	31.2	
Total	1046	48.4	1116	51.6	***	1357	63.9	768	36.1	***
Index of multiple deprivation (quintiles)										
1 (least deprived)	233	52.0	215	48.0		260	60.3	171	39.7	
2	228	52.4	207	47.6		258	61.3	163	38.7	
3	221	47.3	246	52.7		277	62.1	169	37.9	
4	208	46.2	242	53.8		314	67.8	149	32.2	
5 (most deprived)	186	44.4	233	55.6		281	66.9	139	33.1	
Total	1076	48.5	1143	51.5		1390	63.7	791	36.3	
Black or minority ethnic group										
No	886	48.7	933	51.3		1130	63.3	655	36.7	
Yes	170	49.0	177	51.0		223	65.2	119	34.8	
Total	1056	48.8	1110	51.2		1353	63.6	774	36.4	

** p<0.05 ** p<0.01 *** p<0.001*

A series of binary logistic regressions was undertaken to understand the most important factors in the associations between sociodemographic variables and perceptions of early labour care (Tables 4 and 5). These confirmed the importance of parity and ethnicity for worries about going in to labour, and suggested that, when other adjusted for other variables, women aged 20-24 years experienced greater worry about not knowing when labour would start. Multiparous women and those aged 40 years or more were significantly less likely to contact a health care professional; and women aged

20-24 years were significantly less likely to feel that they had received appropriate advice (Table 5). Parity and, marginally, residence in an area of deprivation remained associated with being asked to come into hospital (sometimes after being asked to wait or phone back later) after adjustment for the other sociodemographic factors.

Table 4 – Binary logistic regression showing effects of sociodemographic factors on worries about going into labour, each variable adjusted for all others

		Very/quite worried about not knowing when labour would start		Very/quite worried about getting to hospital in time	
		OR	(95% CI)	OR	(95% CI)
Maternal age (years)	<20	0.98	(0.60, 1.61)	0.78	(0.46, 1.35)
	20-24	1.41	(1.09, 1.83)	1.20	(0.92, 1.57)
	25-29	0.96	(0.79, 1.16)	1.10	(0.90, 1.33)
	30-34	1		1.00	
	35-39	1.08	(0.88, 1.34)	1.05	(0.85, 1.31)
	40+	0.91	(0.61, 1.37)	0.89	(0.59, 1.35)
Parity	Primiparous	1.00		1.00	
	Multiparous	0.72	(0.62, 0.84)	1.30	(1.11, 1.52)
Index of multiple deprivation	1 (least deprived)	1.00		1.00	
	2	0.94	(0.74, 1.19)	0.96	(0.75, 1.23)
	3	0.98	(0.77, 1.24)	1.01	(0.80, 1.29)
	4	1.13	(0.89, 1.42)	1.00	(0.78, 1.27)
	5 (most deprived)	0.91	(0.71, 1.17)	0.92	(0.71, 1.19)
Ethnicity	White	1.00		1.00	
	BME	1.93	(1.56, 2.39)	1.56	(1.26, 1.92)

BME Black or minority ethnic group

Antenatal education

In the UK, women are given information and a registration form for antenatal classes at the time of booking. However, there has been a substantial decline in NHS (free) provision of antenatal classes.(31) It was postulated that worry about labour might be reduced in women who had attended antenatal education. Half of primiparous but only 9% of multiparous women attended NHS antenatal classes, a further 23% of primiparous and 5% of multiparous women attended non-NHS classes for which they paid. For *primiparous women only*, there was a strong association between

being unable to attend NHS classes, either because they were not offered or because they were booked up, and feeling 'very worried' about not knowing when labour would start (but not about getting to hospital in time). After adjustment for age, ethnicity and IMD, women who did not have access to antenatal classes had an Odds ratio of 1.58 (95% confidence interval 1.10-2.25) of being very worried about not knowing when labour would start. BME women were significantly less likely to attend antenatal classes due to not being offered them or them being booked up. However, those BME women who *did* attend classes were no less likely to be worried about these aspects of early labour. These data are shown in Supplementary data.

Table 5 – Binary logistic regression showing combined effects of sociodemographic factors on experience of contacting midwife or hospital in early labour

		Contacted HCP at start of labour		Received appropriate advice		Asked to come into hospital	
		OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Maternal age (years)	<20	0.87	(0.39, 1.90)	0.55	(0.28, 1.05)	1.51	(0.79, 2.86)
	20-24	1.40	(0.90, 2.19)	0.57	(0.40, 0.81)	0.95	(0.70, 1.30)
	25-29	1.27	(0.93, 1.73)	0.87	(0.65, 1.16)	1.08	(0.86, 1.35)
	30-34	1.00		1.00		1.00	
	35-39	0.97	(0.71, 1.34)	1.17	(0.82, 1.67)	0.93	(0.72, 1.21)
	40+	0.56	(0.33, 0.96)	2.70	(0.96, 7.58)	0.77	(0.47, 1.28)
Parity	Primiparous	1.00		1.00		1.00	
	Multiparous	0.59	(0.46, 0.75)	1.24	(0.98, 1.58)	1.63	(1.35, 1.96)
Index of multiple deprivation	1 (least deprived)	1.00		1.00		1.00	
	2	0.75	(0.52, 1.09)	0.84	(0.58, 1.21)	1.09	(0.82, 1.45)
	3	0.95	(0.65, 1.39)	0.99	(0.68, 1.43)	1.11	(0.84, 1.47)
	4	0.70	(0.49, 1.02)	0.95	(0.66, 1.38)	1.34	(1.01, 1.79)
	5 (most deprived)	0.91	(0.60, 1.36)	0.88	(0.60, 1.29)	1.23	(0.91, 1.66)
Ethnicity	White	1.00		1.00		1.00	
	BME	1.39	(0.98, 1.99)	0.89	(0.65, 1.23)	1.00	(0.77, 1.29)

BME Black and minority ethnic group HCP Health care professional

Qualitative results

Fifty-nine women wrote free-text comments relating to early labour. Table 6 shows the characteristics of these women compared to survey respondents overall. They were disproportionately older, primiparous, more educated and resident in the least deprived quintiles but none of the differences was statistically significant. Table 7 shows the main themes that arose from the free-text comments relating to early labour. These were '*Differentiating between early and active labour*', '*Staff attitudes*', '*Not being allowed…*', '*Previous labours*', and '*Perceived consequences for women*'. Individual quotations are used to illustrate these themes.

Table 6 – Sociodemographic characteristics of women who wrote free-text comments relating to early labour compared to all respondents

		Women who wrote free-text comments relating to early labour		All women who completed the questionnaire	
		N	%	N	%
Maternal age (years)	16-24	7	11.9	640	14.0
	25-34	22	37.3	2818	61.6
	35 or more	30	50.8	1118	24.2
	Total	59	100	4576	100
Parity	Primiparous	32	56.1	2207	49.8
	Multiparous	25	43.9	2223	50.2
	Total	57	100	4430	100
Ethnicity	White	49	84.5	3715	83.9
	BME	9	15.5	713	16.1
	Total	58	100	4428	100
Index of multiple deprivation	1 (least deprived)	15	25.4	901	19.7
	2	12	20.3	867	18.9
	3	13	22.0	935	20.4
	4	9	15.2	978	21.4
	5 (most deprived)	10	16.9	896	19.6
	Total	59	100	4577	100
Left FT education aged <16 years		6	10.3	757	16.9
Left FT education aged 16 years or more		53	89.7	3727	83.1
	Total	59	100	4484	100

BME Black and minority ethnic group; FT full time

Differentiating between early and active labour

Women understood that to be credible and viewed by midwives as genuinely in labour, they had to meet certain criteria regarding frequency and duration of contractions. However, not all women in active labour met these criteria:

> *Contractions started on a Weds, had the baby on a Saturday. Kept ringing the maternity ward to be told not to come in until I was 3-10-1 (3 contractions in 10 minutes, lasting 1 minute each). That isn't going to apply to everyone and [one] should be invited into hospital. [Primip, IMD1, 25-29 yrs, white]*

> *Went into hospital in labour 3 min contractions and sent home again as only 1.5 cm dilated - less than 2 hours later I gave birth, crowning in the hospital car park, head out in the elevator. This was very traumatic and wish they allowed me to stay instead of stranding me at home. [Primip, IMD5, 30-34 yrs, white]*

Women also reported that midwives judged from their voice and behaviour whether they were in active labour. Some women therefore deliberately 'acted' the part:

> *When we went into labour with this baby, I phoned the hospital twice and both times they said I didn't sound like I was in labour and suggested I stay at home, […] They made us feel a bit silly for coming into hospital, as I wasn't "screaming and shouting", they assumed I was only in early labour. [Multip, IMD3, 35-39 yrs, white]*

> *[…] After my husband lied to the hospital about the time between contractions I was eventually told to come in. Although my waters hadn't broken I was already 6 cm dilated. [Primip, IMD2, 30-34 yrs, white]*

Table 7 – Main themes and examples arising from the qualitative analysis

Themes	Sub-themes	Examples
Differentiating between early and active labour	'Rules' about contractions Behaviour of women in active labour Having to pretend/exaggerate about contractions	*[…] Called hospital 9 hours later, told midwife I had urge to push, still advised to stay home due to contraction frequency. Felt very uncomfortable, husband called 999, waters broke as soon as ambulance came and I began pushing at home. Decided to go to hospital by ambulance, baby born shortly after arrival. [Primip, IMD1, 25-29 yrs, white]*
Staff attitudes	Insensitive, rude, abrupt, dismissive, negative response Being made to feel foolish Feeling vindicated – women in active labour not early labour as staff had thought Received inappropriate advice: stay home, have bath, take paracetamol	*I was distressed during my labour as one of the midwives was very patronising in telling me that my contractions weren't as painful as I was experiencing, she sent me home twice. [Primip, IMD5, 30-34 yrs, BME]*
Not being allowed…	To come in, to stay – sent home, unit busy Be examined/checked Having to beg for VE	*I felt quite pushed back from the hospital when I phoned. I was bleeding (my show) and having regular pains but I just got told to stay at home and if I went through they would just send me away. [Primip, IMD5, 20-24 yrs, BME]*
Previous labours	Primiparous women needing reassurance, being uncertain Multiparous women having experience, recognising active labour, being dismissed	*When I went into labour with my 3rd child I called the labour ward and wanted to come into hospital but they wouldn't let me. I didn't feel like she was listening to me even though I said I labour quickly.*
Perceived consequences for women	Rushed delivery - insufficient time for preparation & pain relief Not a normal birth - Instrumental/operative delivery Upset - distress, delayed attachment to baby	*[…] Felt unhappy as hadn't had chance for pain relief option and baby had become distressed. Felt that I should have been kept in hospital when first went in or made to feel more welcome on phone. Not the way I wanted my labour to be and was worrying for me and my husband. [Primip, IMD1, 25-29 yrs, white]*

Staff attitudes

Many women perceived negative staff attitudes both on the phone and when attending the unit for assessment. Women were made to feel foolish by midwives who were insensitive, rude, abrupt and dismissive:

[...] I had to scream/cry down the phone before she abruptly told me "you better come in then" not a pleasant experience. [Multip, IMD3, 30-34 yrs, white]

Another common sub-theme was women feeling vindicated, the midwife having assumed that they were not in active labour, but upon examination, they were close to full dilatation:

I knew I was further along than they assumed and insisted on an exam where they discovered I was 6cm and baby came 3 hours later! [Multip, IMD3, 35-39 yrs, white]

Eventually I rang back to say I want to come in to be checked over only to be told "well you will probably end up going home anyway". [...] Would like to point out when arrived at hospital when I was checked over I was 9 cm. [Primip, IMD1, 25-29 yrs, white]

Not being allowed…

Women reported not being allowed to come into hospital, not being allowed to stay, and in a few cases, having to beg for a vaginal examination. This made them more anxious as they felt that hospital was a safer place than home:

Labour was slow so kept getting told to stay at home - that was very distressing and made me more anxious. [Primip, IMD3, 25-29 yrs, BME]

Crying out in pain and begging for midwife to check over/do internal to see how dilated. Only then discovered 6/7 cm dilated and wheeled in wheelchair to labour ward. [Primip, IMD1, 25-29 yrs, white]

In addition, some women reported that staff did not take account of their travel time, necessitating several lengthy and uncomfortable journeys:

My waters broke 11.30pm - phoned hospital told to go in […] Got told to go home as it was my 1st baby - told to look out for contractions […] by 7am I was in pain - phoned hospital told to go back in - my 3rd 40 min journey - when I got to hospital - got told I was in the very early stages of labour - not checked at all and got told to go home […] Got home - another 40 min journey. Started bleeding was being sick and in pain - phone hospital again and got told to go back AGAIN […] When I got to the hospital, I couldn't walk […] Got to the labour ward on the 6th floor - told I was fully dilated and the head was there […] [Primip, IMD3, 35-39 yrs, white]

The above quote also illustrates a sub-theme of 'Not being checked' which was reported by several women and was associated with delay in diagnosis of active labour and inappropriate management:

[…] labour started naturally at 1am. I informed the midwife at 5am but she refused to believe I was in established labour. By the time I convinced her to check me at 7:45am, I was 9cm dilated and baby was born within next ten mins. The lesson to be learnt is that some midwives will only take you seriously if you are screaming in pain. [Multip, IMD4, 25-29 yrs, ethnicity missing]

Previous labours

Some midwives were reportedly unwilling to take account of parity in assessing whether a woman was in early or active labour. Primiparous women clearly need more support and reassurance:

Being my first pregnancy when I went into labour I was unsure. […] I feel for first time mums - a little more understanding at the hospital that we don't know what our bodies are doing would help. [Primip, IMD2, 30-34 yrs, white]

Multiparous women who had experienced labour before are likely to recognise the different stages and sometimes reported not being listened to. Advice to other women included *"you know your body"* and *"trust your instincts".*

[…] My husband was told to leave and I was transferred to a ward. I was still having contractions but told it would be ages until active labour. I explained my contractions were always irregular

but once pain increased the 2nd stage would be very quick [...] My husband was still told to go home. After he left I started having more painful contractions and called for the midwife. She checked me and thought active labour had started and went to call the labour ward. I had to call her back 5 minutes later as I needed to start pushing. I called my husband but he did not get there in time. It was a very scary experience as there was no equipment in the room to deliver the baby (as it was a normal antenatal ward) […] [Multip, IMD3, 30-34 yrs, BME]

When I went into labour with my 3rd child I called the labour ward and wanted to come into hospital but they wouldn't let me. I didn't feel like she was listening to me even though I said I labour quickly. By the time I got to hospital I was in too much pain to have IV's [for Group B strep]. If I'd gone into hospital when I wanted to then I would have had pain relief sooner and would have received the antibiotics. [Multip, IMD5, 35-39 yrs, white]

Perceived consequences for women

Many of the women who had felt let down by staff in early labour, having to stay at home when they wanted to be in hospital, went on to report a failure to get appropriate pain relief and medication (as in the previous quote), a rushed, sometimes operative, delivery, feelings of shock and delayed attachment to their baby:

My labour was a bit stop-start and the unit suggested I didn't come in until the contractions were every 3 mins and at least 1 minute in duration. I don't feel this was the right advice for me and regret not going to get checked out as I think if I had gone in after my contractions were about 5 minutes, I may have had a natural birth rather than C-section. However, the care I received was excellent other than that. [Primip, IMD2, 25-29 yrs, white]

[…] My baby's head was already out by the time the midwife arrived in the room. I had to have my baby standing up as there was not time to get on the bed. I was in complete shock when my baby was born due to this and I did not feel the immediate rush of love for my baby because I was in too much shock and pain. [Multip, IMD3, 30-34 yrs, white]

Some women ascribed their poor experiences to staff shortages or the facilities being particularly busy:

> *They [staff] were horribly rushed, kept saying things would happen that didn't happen, didn't pass information between colleagues, and didn't give us consistent information. It was clear that they were horribly overworked and were dealing with people in more priority than me. I feel confident that I would have got more attention had I been higher priority (I wasn't at risk) but it was an unpleasant experience where I felt powerless and confused for a lot of the time … [Primip, IMD2, 30-34 yrs, white]*

All the free-text comments relating to early labour were negative so it was not possible to estimate the association between qualitative comments and the quantitative measure of satisfaction with care during labour and birth. However, among women who wrote a free-text comment relating to early labour, only 32.1% were very satisfied with their care at this time compared to 62.8% in the whole sample. The proportions who were very dissatisfied were 7.1% and 2.3% respectively. Similarly, whilst 84% of women overall felt that they received appropriate advice when they phoned a midwife in early labour, only 36% of women who wrote free-text comments considered the advice appropriate.

DISCUSSION

The findings of this study suggest that there is considerable variation in women's experience of early labour by sociodemographic characteristics. Although the differences by parity are to be expected, the significantly increased worry among BME women is more surprising. However, it confirms the findings of a previous study which found that ethnic minority women were more likely to report high levels of worry about almost all aspects of birth, irrespective of parity and residence in an area of deprivation.(32) After adjusting for parity, ethnicity and IMD, women aged 20-24 years were also more likely to be worried about not knowing when labour would start and, again, this is consistent with earlier research.(22) Women in this age group were also significantly less likely to feel that they

received appropriate advice when they phoned a midwife or the hospital. This may reflect a perception in this group that they are viewed as problematic and immature by health care professionals.(33)

Primiparous women who were not able to attend NHS antenatal classes, either because they were not offered or because they were booked up, were significantly more likely to be very worried about not knowing when labour would start. This finding persisted after adjustment for sociodemographic characteristics. This is consistent with the findings of a Danish randomised controlled trial which found that antenatal education in small groups increased women's confidence in their ability to cope at home during labour.(34) However, the women who were unable to access NHS antenatal education in the current study were also significantly less likely to have planned their pregnancy or to have booked before 10 weeks. Thus, they may have been more worried generally.

The free-text comments relating to women's experience of early labour were entirely negative. This partly reflects the propensity for respondents to write additional comments when they have an issue about which they would like to comment or complain.(29) To put it into context, over three-quarters of women contacting a midwife or hospital at the start of labour reported receiving appropriate advice but the corresponding proportion for women who wrote free-text responses on this topic was just over a third. The main themes related to women's perceptions of staff assumptions and attitudes, and not being allowed to come to hospital or stay, and these resonate strongly with earlier studies.(2, 16-18, 20, 35) In particular, the study by Spiby et al (2014)(20) used focus groups to understand the views of UK midwives dealing with women in early labour. They found that some midwives held negative perceptions and stereotypes of women and labelled them accordingly. Studies which analysed this subject from women's perspectives underscored the importance to women of arriving at the hospital at the 'right time', the distress associated with being sent home, and the impact of having a caring or uncaring midwife, of being believed.(2, 16) The neglect felt by

some women at this time echoes the results of a study of women's experience of the early phase of induction of labour.(36)

The other two themes that arose in this study related to parity and the perceived consequences for women of poor early labour care. Parity is not mentioned in the literature although some studies only included primiparous women.(12, 14, 17, 18) In this study, the issues facing primiparous and multiparous women differed: primiparous women wanted more support and reassurance whereas multiparous women, having already experienced labour, remembered how it felt and were sometimes angry at not being believed. Some women perceived negative consequences resulting from inaccurate diagnosis of labour. These included a lack of time for pain relief, medication and a perception of delayed attachment to their baby, also women who thought that an operative delivery may have been avoided had early labour been better managed. Although this latter outcome has been demonstrated to result from admission in early labour,(1, 2) no qualitative studies have reported on this.

A strength of this study is that it was based on a large random sample of births in England and uses both quantitative and qualitative data from the same primiparous and multiparous women. Limitations include the 47% response rate with under-representation of young women, those born outside the UK, and women resident in deprived areas.(27) However, 16% of respondents were BME, 17% left full-time education aged 16 years or less, 20% were resident in the most deprived quintile, and 13% did not have a partner at the time of the survey. Similarly, the free-text comments were disproportionately from primiparous, more educated women, and those resident in the least deprived quintile. However, qualitative research aims to be transferable rather than generalisable and the characteristics of women who wrote free-text comments are shown in Table 6. Moreover, the findings are consistent with those of other studies and the numbers of women, even in minority groups, are substantial. A further limitation of the quantitative data is that they are entirely based

on women's perception and recall of events, which may be inaccurate. However, recall of salient events in childbirth is generally good.(37, 38)

Conclusions and implications for practice

These findings reinforce those of other studies stressing the importance of providing reassurance to women in early labour, taking care that women do not feel neglected or dismissed. In particular, young primiparous women and those from minority ethnic groups report greater worry about aspects of early labour than other women and require additional reassurance. Whilst most women who are not contracting strongly and regularly can be reassured that they can safely stay at home, some women labour very rapidly. The Norwegian midwives cited in the study by Eri et al (2011)(19) recommended that women come into hospital to be assessed and to see how their labour progresses. If they are not in active labour, they can then decide for themselves that they would be more comfortable at home and feel confident in going home.(19) A standalone triage unit for women in early labour, separate from the labour ward, would not be influenced by the workload there and could help women to have a more positive experience of early labour. This model may require additional resources to set up, but if it helps women to come into hospital in active labour, it may save resources overall.

Antenatal education may have a role in improving women's and partners' knowledge and confidence in coping at home but a recent systematic review reported a lack of good evidence as to its effectiveness in promoting good obstetric and psychosocial outcomes more generally.(39) The maternity services should consider whether women's information needs are being met.

In summary, most women were not particularly worried about early labour and most of those who contacted a midwife at this time felt that they received appropriate advice. However, some women clearly felt that their care at this time had been poor suggesting that this is an area where improvements could be made.

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COMPETING INTERESTS

The authors declare that they have no competing interests.

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AUTHORS' CONTRIBUTIONS

JH initiated this study, conducted the analyses and drafted the manuscript. MR was the principal investigator for women's surveys and helped direct the analysis. Both authors revised the manuscript.

DATA SHARING STATEMENT

Further analyses of these data are planned so data will not be shared until these are completed.

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Figure 1 – Numbers and proportions of women contacting midwife or hospital at the start of labour and resulting care (of the 3099 women who had neither induction of labour nor a planned caesarean section before the start of labour)

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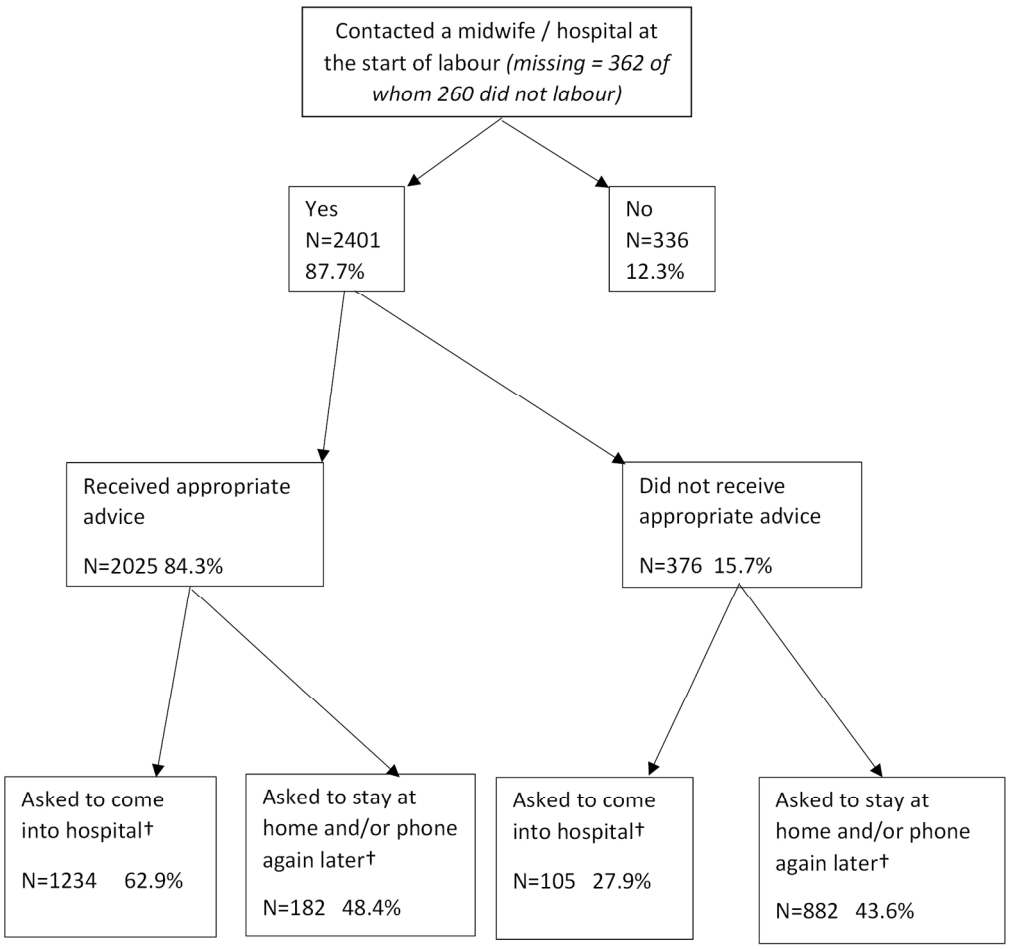

† Not exclusive categories

Figure 1 – Numbers and proportions of women contacting midwife or hospital at the start of labour and resulting care (of the 3099 women who had neither induction of labour nor a planned caesarean section before the start of labour)

163x180mm (300 x 300 DPI)

Supplementary data on antenatal education

	Offered AN classes		Attended NHS classes								Paid for AN classes	
			Yes		No, booked up		No, not offered		Not wanted			
Maternal age (years)	N	%	N	%	N	%	N	%	No.	%	N	%
<20	57	73.1	20	25.6	4	5.1	14	17.9	28	35.9	0	0.0
20-24	240	68.0	97	28.0	13	3.8	75	21.7	115	33.2	11	3.2
25-29	586	70.3	289	35.1	15	1.8	165	20.0	235	28.6	82	9.9
30-34	700	64.0	314	29.4	19	1.8	266	24.9	315	29.5	200	18.4
35-39	342	59.6	144	25.9	10	1.8	149	26.8	163	29.3	106	18.5
40+	61	52.1	23	21.3	2	1.9	35	32.4	30	27.8	19	16.4
Total	1986	65.1 ***	887	29.8	63	2.1	704	23.6	886	29.7 **	418	13.8 ***
Parity												
Primiparous	1218	83.5	725	50.0	43	3.0	158	10.9	286	19.7	336	23.1
Multiparous	717	47.4	130	9.0	18	1.2	531	36.6	582	40.1	72	4.8
Total	1935	65.2 ***	855	29.5	61	2.1	689	23.7	868	29.9 ***	408	13.8 ***
Index of multiple deprivation (quintiles)												
1 (least deprived)	393	66.2	176	30.0	10	1.7	137	23.4	160	27.3	129	21.9
2	421	70.6	190	33.0	14	2.4	113	19.6	165	28.6	112	19.0
3	408	65.6	202	33.3	13	2.1	149	24.5	161	26.5	86	14.0
4	410	63.2	181	28.7	12	1.9	154	24.4	202	32.0	63	9.7
5 (most deprived)	353	59.9	138	23.8	14	2.4	151	26.0	198	34.1	28	4.8
Total	1985	65.1 **	887	29.8	63	2.1	704	23.6	886	29.7 **	418	13.8 ***
Black or minority ethnic group												
No	1656	66.8	736	30.5	46	1.9	558	23.1	732	30.3	366	14.9
Yes	282	57.9	125	25.9	14	2.9	131	27.1	130	26.9	45	9.3

Total	1938	65.4 ***	861	29.7	60	2.1	689	23.8	862	29.7 *	411	14.0 **

Missing values: Offered AN classes 48; Attended AN classes 118; Paid for private classes 69

Association between worry about aspects of early labour and attendance at antenatal classes (Primips only)

	Attended AN classes		**Classes all booked up or not offered**		**Did not wish to attend or did not attend for other reason**	
	No.	%	No.	%	No.	%
Very worried about not knowing when labour would start (p=0.002)	136	12.4	57	19.8	90	12.3
Very worried about getting to hospital in time (NS)	94	8.5	35	12.3	68	9.3

Logistic regression on feeling very worried about not knowing when labour would start adjusted for age, IMD, and ethnicity	**OR (95% CI)**
Attended AN classes	1
Classes all booked up or not offered	1.58 (1.10, 2.25)
Did not wish to attend or did not attend for other reason	0.94 (0.70, 1.26)

STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No	Recommendation	Page
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4-6
Objectives	3	State specific objectives, including any prespecified hypotheses	6
Methods			
Study design	4	Present key elements of study design early in the paper	6
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	6
Participants	6	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants	6
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed *Case-control study*—For matched studies, give matching criteria and the number of controls per case	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6-7
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	6-7
Bias	9	Describe any efforts to address potential sources of bias	7
Study size	10	Explain how the study size was arrived at	6
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	7
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	7
		(*b*) Describe any methods used to examine subgroups and interactions	
		(*c*) Explain how missing data were addressed	
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed *Case-control study*—If applicable, explain how matching of cases and controls was addressed *Cross-sectional study*—If applicable, describe analytical methods taking account of sampling strategy	
		(*e*) Describe any sensitivity analyses	

Continued on next page

Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	7-8
		(b) Give reasons for non-participation at each stage	
		(c) Consider use of a flow diagram	Fig 1
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	Tables 1-3
		(b) Indicate number of participants with missing data for each variable of interest	
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)	
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time	
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	
		Cross-sectional study—Report numbers of outcome events or summary measures	Tables 1-3
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	Tables 4-5
		(*b*) Report category boundaries when continuous variables were categorized	
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	
Discussion			
Key results	18	Summarise key results with reference to study objectives	20
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	22
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	20-22
Generalisability	21	Discuss the generalisability (external validity) of the study results	22
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	23

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.