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## The impact of birthplace on women's birth experiences and perceptions of care

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### ABSTRACT

Overall birth experience is an important outcome of birth, and studies of psycho-social birth outcomes and women's perspectives on care are increasingly used to evaluate and develop maternity care services. We examined the influence of birthplace on women's birth experiences and perceptions of care in two freestanding midwifery units (FMU) and two obstetric units (OU) in north Denmark, all pursuing an ideal of high-quality, humanistic and patient-centred care. As part of a matched cohort study, a postal questionnaire survey was undertaken. Two hundred and eighteen low-risk women in FMU care, admitted between January–October 2006, and an obstetrically/socio-demographically matched control group of 218 low-risk women admitted to an OU were invited to participate. Three hundred and seventy-five women (86%) responded. Birth experience and satisfaction with care were rated significantly more positively by FMU than by OU women. Significantly better results for FMU care were also found for specific patient-centred care elements (support, participation in decision-making, attentiveness to psychological needs and to wishes for birth, information, and for women's feeling of being listened to). Adjustment for medical birth factors slightly increased the positive effect of FMU care. Subgroup analysis showed that a significant, negative effect of low education and employment level on birth experience was found only for the OU group. Our results provide strong support of FMU care and underline the big challenges in providing individual and supportive care for all women, especially in OUs. Policy-makers and professionals need to consider how the advantages provided by FMU care can support the effort to improve women's birth experience and possibly also the combat of the negative effect of social disadvantage on health.

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### Introduction

System responsiveness and patient-centredness has become an important quality indicator of national health services (Committee on Quality of Health Care in America, 2001; World Health Organisation, 2000). The assessment and development of services are increasingly influenced by concepts of patient-centred care that underline the importance of information, communication, emotional support, and respect for patients' values, preferences, and their expressed needs (Gerteis, Edgman-Levitan, & Daley, 1993).

In the field of maternity care, the patient-centred perspective exerts a strong and justified influence on reform and development initiatives as it is well-documented that women's experience of

birth and the care provided during this important life event have immediate as well as long term effects on their well-being and health (Gibbins & Thomson, 2001; Parfitt & Ayers, 2009).

While positive birth experiences contribute to women's feeling of accomplishment and self-esteem and lead to psychological growth, empowerment, and easier adaptation to motherhood (Simkin, 1991), negative experiences are associated with a number of complications such as postpartum anxiety, depression, post-traumatic stress syndrome (White, Matthey, Boyd, & Barnett, 2006), fear of childbirth (Waldenström, Hildingsson, & Ryding, 2006), reduced future reproduction (Gottwall & Waldenström, 2002), and request for caesarean section (Tschudin et al., 2009).

Four key dimensions of patient-centred care (Gerteis et al., 1993) have been identified as prominent aspects of the childbirth experience: the woman's perceptions of intrapartum support, participation in decision-making, information, and control (Green & Baston, 2003; Lavender, Walkinshaw, & Walton, 1999; Séguin, Therrien, Champagne, & Larouche, 1989; Waldenström et al., 2006).

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Several studies have established a relationship between a high level of intervention and a negative birth experience (Salmon & Drew, 1992; Waldenstrom, Hildingsson, Rubertsson, & Radestad, 2004; Wilde-Larsson, Sandin-Bojô, Starrin, & Larsson, 2011), thus supporting the claim that natural childbirth improves women's experience (Oakley, 1980). Others, however, have argued that findings of better childbirth satisfaction among women reporting low pain levels (Salmon & Drew, 1992; Waldenström, 1999) provide support for effective medical pain relief as essential to a positive birth experience (Kangas-Saarela & Kangas-Kärki, 1994). However, a positive effect on birth experience has not been documented, even for epidural analgesia, the most effective type of pain relief (Anim-Somuah, Smyth, & Howell, 2005).

#### *Environment and birthplace*

In terms of environment and context, birthplace and care provider have been identified as influencing the above, with the medical paradigm of childbirth said to be dominant in most high and middle income countries (Davis-Floyd, 1992). Its hegemony is reflected in an almost full hospitalisation of births and a global trend over the last decades towards rising rates of interventions and medical pain relief and centralisation/specialisation of maternity units (Stephenson et al., 1993; Tracy, Sullivan, Wang, Black, & Tracy, 2007) but has attracted criticism for being inhumane, disempowering, unaccommodating of women's and infants' psycho-social needs, and for exposing women to unnecessary risks (Johanson, Newburn, & Macfarlane, 2002; Roundtable discussion, 2006).

In contrast, the social/holistic paradigm emphasises a spirit of "body-mind oneness" (Davis-Floyd, 2001, p. S16) and totally individualised care. It encompasses a diverse range of beliefs and propounds "natural" childbirth as a social event and a normal bodily process where women may obtain control by letting go (Gaskin, 2003). Midwife-led care and out-of-hospital settings have been identified as more likely to support such philosophies (Walsh, 2006). However, this paradigm is under strong criticism for ignoring medical risk and jeopardising mothers' and infants' welfare. Its opponents see it as representing a romantic utopian dream, while feminist critics attack its "essentialist" approach to birth and gender as a perpetuation of the repression of women (Beckett, 2005; Moscucci, 2002).

Although commonly purported as dichotomous views by their respective proponents, these understandings fail to grasp the complexity of childbirth and have been challenged. Thus, it has been reported, that women may in fact experience empowerment through the rigorous management and control of the birth process and perceive elimination of pain or choice of a caesarean section as the ultimate form of control (Beckett, 2005; Sargent & Stark, 1989), and that some women are capable of influencing their care within the medical system (Zadoroznyj, 2001). Furthermore, women's perceptions of birth have been found to be influenced by e.g. their expectations (Green, Coupland, & Kitzinger, 1998) or medical factors such as a long labour or the condition of the newborn (Rijnders et al., 2008). Negative influences stemming from socio-demographic factors such as young age, primiparity, and especially low education/low social class have been suggested (Wilde-Larsson et al., 2011; Zadoroznyj, 1999), but findings are inconsistent (Brown & Lumley, 1994; Ranta et al., 1995; Waldenström, 1999; Waldenstrom et al., 2004).

In her later work Davis-Floyd identifies a third, "humanistic" paradigm emerging from inside the medical health care system in an attempt to reform care from within, making it "relational, partnership-oriented, individually responsive and compassionate" (2001, p.S10). We see the broad support for this perspective,

nourished by general societal trends towards patient-centredness, reflected in maternity care policies in countries with public health care systems and the global opening of midwifery units (Morano et al., 2007; Rana, Rajopadhyaya, Bajracharya, Karmacharya, & Osrin, 2003; Riesco et al., 2009).

#### *Midwifery units*

Midwifery units providing care for women with low risk of obstetric complications are managed and staffed exclusively by midwives. The units may be located in the vicinity of a hospital obstetric unit, hence termed an "alongside" midwifery unit (AMU), or form a physically separate, freestanding midwifery unit (FMU) (National Perinatal Epidemiology Unit, 2007) from which transferral to an obstetric unit (OU) is made in case of complications. Midwifery units have developed from the "alternative" birth centres of the 1970s and 1980s into today's often publicly financed units forming part of established birth services (Department of Health, 2007; Helsedirektoratet, 2010). The safety of such units continues to be contested despite the findings of a Cochrane review comparing AMU and OU care regimes. This review reported significant reductions in medical interventions in AMUs and comparable perinatal mortality and morbidity and maternal morbidity (Hodnett, Downe, Walsh, & Weston, 2010). Moreover, consistent reports of better psycho-social outcomes of care in midwifery units when compared to OUs (Fraser et al., 2000; Hodnett et al., 2010; Hunter, 2009; Saunders, Boulton, Chapple, Ratcliff, & Levitan, 2000; Walker, Hall, & Thomas, 1995) corroborate the claims that midwifery units provide "individualised and family-centred maternity care with a strong emphasis on skilled, sensitive and respectful midwifery" (Shallow, 2003, 13).

Though there is some evidence to support this claim for AMUs, some studies were weakened by factors such as low response rates (Begley, Devane, & Clarke, 2009; Burne, Crowther, & Moss, 2000), small sample sizes (Burne et al. 2000; Hunter, 2009) or differences in the antenatal care offered (Waldenström & Nilsson, 1994). Furthermore, in some studies the two groups had different socio-demographic characteristics and/or different lead care providers (Begley et al., 2009; Fraser et al., 2000). An unequivocal conclusion is thus precluded.

Research on FMUs is scarce and no ready generalisation based on findings from AMUs studies is possible, especially because of the difference in transfer times and OU attachment. A study of a British FMU has suggested that FMUs have distinct, non-bureaucratic characteristics that facilitate flexibility and relational care and allow for alternative responses to clinical problems (Walsh, 2006). The findings contradicted the results of an older American study where FMU users' best interests were not always considered by midwives hoping to achieve natural childbirth (Annandale, 1987). This may be explained by differences in the health care system (private/public) and the role of midwifery profession (marginal/extensive) in the two study settings.

In this article we seek a deeper insight into women's birth experiences and the role of patient-centred care on the basis of women's rating of their experiences of birth, care element such as the feeling of being listened to, opportunity to participate in decision-making, information provided, and care satisfaction. We present data from a quantitative study of the influence of birthplace in the context of a Scandinavian welfare society where midwives are part of the mainstream maternity care system and the lead carer for all healthy women with low-risk pregnancies and where midwives and most obstetricians subscribe to the humanistic paradigm (DSOG & DADJ, 2001).

## Aims and objectives

The aim of this study was 1) to compare women's birth experience, care satisfaction and perception of specific patient-centred care elements in two FMUs versus two OUs and 2) to explore the influence of specific medical and socio-demographic factors on women's birth experience.

## Pre-specified hypotheses

Our study of the literature led us to hypothesise that FMU care, with its emphasis on psycho-social birth aspects and parent-infant bonding, would have a positive influence on a number of outcomes, including women's overall birth experience and care satisfaction, and on their perception of patient-centred care elements such as information, support, and participation in decision-making. Furthermore, it was hypothesised that the association between birthplace and birth experience would be influenced by a differential use of interventions between groups and that the woman's level of education and employment would correlate positively with her birth experience and perception of care elements.

## Design and methods

Postal questionnaire survey, performed as part of a prospective cohort study with a matched control group.

### Study population

The study population consisted of 436 women: 218 low-risk women receiving FMU care and a matched control group of 218 low-risk women receiving standard OU care.

Women were categorised as low-risk if they were healthy and had straight-forward pregnancies as outlined by the NICE intrapartum guidelines (National Institute for health and clinical excellence, 2007).

## Procedure

All women admitted to one of the two studied FMUs between 1 January 2006 and 30 October 2006 and their matched controls were invited to participate in the study.

Data on women's birth experience, perceptions of patient-centred care elements and experience of postnatal care was collected by use of a postal questionnaire distributed 28 days after birth. Socio-demographic and medical data were collected from medical records.

Women were introduced to the study by project staff via telephone on the day the questionnaire was mailed. A stamped envelope was enclosed as well as a study information sheet, informing women that participation was entirely voluntary and anonymous. Women consented to participation when returning the questionnaire.

To ensure optimal response rate, non-responders were reminded by telephone after 3 weeks.

### Setting

The study was undertaken in two FMUs and two OUs in the North Denmark Region. Denmark has full public coverage of maternity care services and a strong tradition for midwifery-led care for low-risk women regardless of birth setting. Recent years have seen a strong centralisation of maternity care services with >98% of all births now taking place in OUs and rising intervention

rates, although intrapartum care is less medicalised than in most comparable countries. FMUs are rare in Denmark and mainly located in community hospitals in sparsely populated areas. The North Denmark Region was the first to transform two of its four maternity units into FMUs and to organise its maternity services on the basis of close co-operations between FMUs and OUs and shared, interdisciplinary guidelines on referral and transfer.

The FMUs were converted from small maternity units and in a style less home-like than typical for FMUs, although some "softening" of colours and decor had been done. However, efforts were made to make women and their birth companions feel at home and use all the units' facilities such as the kitchen and common room. Ambulation and the use of water and music for pain relief/relaxation were encouraged. The FMUs were staffed by community midwives working in flexible shifts in a team model and generally providing one-to-one care during labour. In case of complications, women/infants were transferred to the nearest OU located 25–35 min away (transfer rate ~7%). Annually ~300 infants were born in the two FMUs.

The supporting OUs were the region's specialist maternity units (3500 and 1400 births annually), both offering 24-h service for epidural analgesia, acupuncture, and use of water tub for pain relief/water birth. The birthing rooms were traditionally equipped with a labour bed as a central feature and some had "soft" colours. Electronic foetal monitoring was only used in case of complications. One-to-one care and continuous support were generally not provided until late in the first stage of labour.

### The matching process

For each FMU participant, a control participant was identified among the low-risk women intending to give birth in the nearest OU. The women were prospectively included at the start of care in labour. Matching was done on nine criteria with an established influence on medical birth outcomes and a potential influence on psycho-social outcomes: low-risk status, parity, smoking, body mass index (BMI), age, ethnicity, educational level, occupation, and co-habitation status.

### Variables and data measurement

The primary study outcome was overall birth experience. Other outcomes were: care satisfaction, support, midwife presence, information, feeling of being listened to, attentiveness towards psychological needs and birth wishes, participation in decision-making, usefulness of suggestions for pain relief, support for partner, support from partner, and loss of internal and external control. Intended birthplace at the start of care in labour was considered the exposure.

Socio-demographic variables used were age, parity, education, employment, first language, and co-habitation. A number of medical variables such as Apgar score, admittance of infant to neonatal ward, caesarean section, instrumental delivery, augmentation of labour, amniotomy, long labour, epidural analgesia, and water birth were included as control factors. Both socio-demographic and medical data were obtained from medical records.

### Power calculation and sample size

The inclusion of 218 women in each group was based on power calculations. This sample provided power (5% significance level, 80% power) to detect an increase in the number of women rating their birth experience as positive from the expected 90.0%

in the OU care group to 97.1% in the FMU group. The estimates used were based on a regional maternity report (Center for Kompetenceudvikling, 2005).

### Materials

No nationwide maternity surveys or controlled studies of birthplace and Danish women's perceptions of care have been published. To optimise the capture of the special characteristics of intrapartum care in the Danish setting and take into account the understandings of women in the partly rural North Denmark Region, a questionnaire was developed on the basis of a literature study supported by semi-structured pilot interviews with new mothers and health professionals. The respondents were encouraged to give a chronological account of their perceptions and to ponder various aspects of their birth experience before assessing their overall experience and satisfaction with care. Questions relating to control in childbirth required special attention as the concept, in the words of Fox and Worts, clearly "meant different things to different women" (1999, p.340). Contrary to this, our pilot study participants easily identified and recalled the feeling of loss of control over both their body/reactions and staff actions, respectively defined as internal and external control (Green & Baston, 2003). The questionnaire therefore focused on e.g. "opportunity to participate in decision-making" and "the feeling of being listened to" as expressions of control and of perceived loss of control.

The questionnaire was validity tested and revised during pilot studies that included interviews with respondents from different social backgrounds exploring their understanding of questions and choice of answers. Furthermore, 24 women participated in a questionnaire test-retest and answered the questionnaire twice with two weeks interval. The test-retest reliability coefficient (Spearman) was 0.95 for birth experience and between 1 and 0.8 for all other questions. Pilot testing lead to corrections of the terms used to describe medical issues and additional text clarifying the line of some questions.

The final version of the questionnaire was a Likert-item derivative, containing 15 intrapartum questions. It had a horizontal presentation and thirteen questions used a 6-point scale. For the

primary question: "Overall, how would you describe your experience of giving birth?" the answers ranged from 1) "very negative" to 6) "outstanding". For rating of satisfaction the answers ranged from 1) extremely dissatisfied to 6) extremely satisfied, and for patient-centred care elements from 1) "unacceptable" to 6) "optimal". The two questions related to loss of control used a 5-point scale ranging from 0) "no loss" to 4) "control lost all through birth". All questions contained a "Don't know"/"not relevant"-option. No open-ended questions were used but women were invited to elaborate on their answers in an open space (data reported elsewhere).

Cronbach's alpha for internal consistency reliability in the total study sample was 0.936. No missing responses was found for birth experience and care satisfaction and for all other questions missing responses were <1%.

### Statistical analysis

Data were analysed by use of STATA 11 statistical software. Analysis was by intention-to-treat.

To fully exploit the robustness of the matched study design with respect to influence from the matched parameters as well as their interactions, groups were compared using Wilcoxon's sign-rank test for paired continuous data. For incomplete pairs, the missing part was multiple imputed using a logistic or, where relevant, ordered logistic regression model on the outcome of the observed party (van Buuren, 2007). The findings were compared with the findings of a supplementary complete-case analysis, performed on only the fully observed pairs, to check for concordance.

As both groups generally gave very positive responses, all primary ordinal outcomes (including the multiply imputed observations) were dichotomised into optimal (score 6) and all other (scores 5–1) and the two groups were compared by use of McNemar's test for paired binary data, which allowed for the calculation of odds ratios and confidence bands, and the findings compared with the findings of the primary analysis.

The influence of selected socio-demographic factors (parity, age, education, and employment) on women's birth experience and psycho-social care elements was tested by logistic regression.

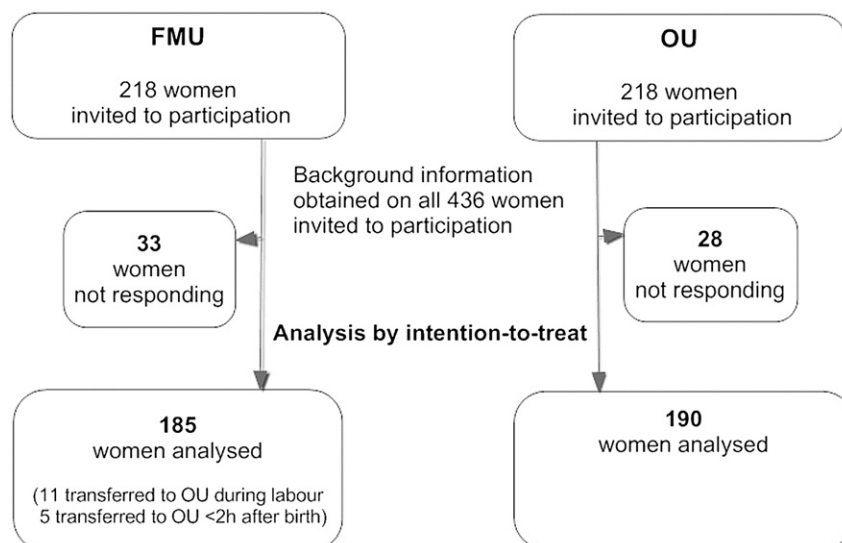


Fig. 1. Flow chart.



Subgroup analyses were performed on the OU and FMU groups, respectively.

To control for a possible effect of medical factors the dichotomised data on birth experience, birthplace, medical factors, and socio-demographic factors was entered into a logistic regression model. Multiple imputation was not relevant as the analysis was unmatched and the data complete or containing very few missing.

The overall level of statistical significance was 5%. The Bonferroni method was used to correct for multiple comparisons.

#### Data security and ethics

Data were treated in strict confidentiality. Ethical approval was provided by Danish Data Protection Agency (reference number: 2005-41–5352), as stipulated by Danish legislation on the use of patient data in research (Justitsministeriet, 2000).

#### Sample description

Of the total of 436 women invited to participation, 185 in the FMU group and 190 in the OU group returned the questionnaire, giving a total response rate of 86% (FMU: 85%; OU: 87%). See Fig. 1.

**Table 1**  
Characteristics of all the 436 women invited versus the 375 respondents.

	Invited		Responders		Non-responders		P-value <sup>a</sup>
	N	(%)	N	(%)	N	(%)	
Parity							0.370
Primipara	98	22.5	87	23.2	11	18.0	
Multipara	338	77.5	288	76.8	50	82.0	
Smoking status							0.006
Non-smokers	355	81.4	313	83.5	42	68.9	
Smokers	81	18.6	62	16.5	19	31.1	
Body Mass Index (BMI)							0.313
BMI ≤ 25	296	67.9	258	68.8	38	62.3	
BMI > 25	140	32.1	117	31.2	23	37.7	
Age							0.583
≤30 years	257	58.9	223	59.5	34	55.7	
>30 years	179	41.1	152	40.5	27	44.3	
First language							0.000
Danish	412	94.5	366	97.6	46	75.4	
Other first language than Danish	24	5.5	9	2.4	15	24.5	
Cohabitation status							0.000
Living with partner	422	96.8	368	98.1	54	88.5	
Living alone	14	3.2	7	1.9	7	11.5	
Education							0.000
No post-secondary education	104	23.9	72	19.2	32	52.5	
Education within the skilled trades	132	30.3	119	31.7	13	21.3	0.100
1–2 years post-secondary education	50	11.5	43	11.5	7	11.5	0.998
3–4 years post-secondary education	129	29.6	123	32.8	6	9.8	0.000
5–6 years post-secondary education	21	4.8	18	4.8	3	4.9	0.968
Employment							0.000
Low level of employment	285	65.5	233	62.1	52	85.2	
High level of employment	151	34.6	142	37.9	9	14.8	
Total	436	100	375	86	61	14	

<sup>a</sup> Chi-square test, respondents versus non-respondents.

#### Responders versus non-responders

Full background information on the socio-demographic characteristics of all the invited women were obtained, thus enabling us to compare the characteristics of responders and non-responders.

As seen in Table 1, most responders had Danish as their first language (97.6%) and lived with a partner (98.1%). No differences in parity, age, and BMI were found between responders and non-responders. Smokers ( $p$ -value ( $p$ ) < 0.006), women without post-secondary education ( $p$  < 0.000), or low employment level ( $p$  < 0.000) and women living alone ( $p$  < 0.000) were significantly less willing to respond. A significantly higher response level was found among women with 3–4 years of post-secondary education ( $p$  < 0.000). Of the 21 FMU women who were transferred to an OU, 16 returned the questionnaire. Seventeen percent of women in the study were smokers and 31% had a BMI >25. With 19% of the women having no post-secondary education and less than 5% in academic/managerial positions, our data reflected accurately conditions in the predominantly rural catchment area of the FMUs where the educational level is among the lowest and the level of unemployment among the highest in Denmark (Danmarks Statistik, 2011).

#### Respondents by study group

Although participants were matched in the overall study, different response rates may have altered the distribution of socio-demographic characteristics (confounders) between women in the two groups. As shown in Table 2, an equal distribution of characteristics was maintained for the two groups of respondents.

**Table 2**  
Characteristics of the 375 responders by study group.

	FMU		OUN		P-value <sup>a</sup>
	N	%	N	%	
Parity					0.822
Primipara	42	22.7	45	23.7	
Multipara	143	77.3	145	76.3	
Smoking status					0.909
Non-smokers	154	83.2	159	83.7	
Smokers	31	16.8	31	16.3	
BMI					0.162
BMI ≤ 25	121	65.4	137	72.1	
BMI > 25	64	34.6	53	27.9	
Age					0.998
≤30 years	110	59.5	113	59.5	
>30 years	75	40.5	77	40.5	
First language					0.331
Danish	182	98.4	184	96.8	
Other first language than Danish	3	1.6	6	3.2	
Cohabitation status					0.729
Living with partner	182	98.4	186	97.9	
Living alone	3	1.6	4	2.1	
Education					0.698
No post-secondary education	37	20.0	35	18.4	0.548
Education within the skilled trades	56	30.3	63	32.2	0.799
1–2 years post-secondary education	22	11.9	21	11.1	0.772
3–4 years post-secondary education	62	33.5	61	32.1	0.671
5–6 years post-secondary education	8	4.3	10	5.3	
Employment					0.840
Low level of employment	114	61.6	119	62.6	
High level of employment	71	38.4	71	37.4	
Total	185	100	190	100	

<sup>a</sup> Chi-square test. No significant differences between the FMU and the OU group are found.

## Findings

### Place of birth and women's birth experience

The 375 respondents gave generally positive evaluations of their birth experience and the care provided in both settings. Fifty-seven percent in the FMU group and 35% in the OU group rated their experience of giving birth as "outstanding" (score 6); no FMU women and only 1% of OU women reported a "very negative" birth experience (score 1). FMU women also rated their overall birth experience significantly more positively than did the OU women (mean:5.5(FMU)/5.0(OU);  $p < 0.0000$ ) (see Table 3).

### Care satisfaction and patient-centred care elements

Moreover, satisfaction with care was significantly better among FMU women (5.7/5.3;  $p < 0.0000$ ). Compared to OU women, their rating of several patient-centred care elements was consistently higher: midwife support (5.7/5.4;  $p < 0.0000$ ), midwife presence when wanted (5.7/5.4;  $p < 0.0000$ , staff attentiveness to psychological needs (5.4/4.9;  $p < 0.0000$ ) and to wishes for birth (5.6/4.9;  $p < 0.0000$ ), feeling of being listened to (5.4/5.0;  $p < 0.0000$ ), information (5.4/5.0;  $p < 0.0000$ ), participation in decision-making (5.4/4.9;  $p < 0.0000$ ), and staff support for partner (5.3/5.0;  $p < 0.0013$ ).

There were no significant differences between the two groups with regard to their experience of loss of external control over staff actions or internal control over labour and own reactions, support provided by their partners, usefulness of the midwife's suggestions for pain relief, and opportunities for undisturbed contact with the newborn.

As is often the case in maternity surveys (Brown & Lumley, 1997), responses in both groups were skewed towards the very positive scores, and a supplementary analysis was therefore performed. In this analysis we focused on differences between groups in the women's use of the top rating (score 6) and dichotomised the outcome variables into an optimal versus an all other category. The groups were then compared by use of McNemar's test and multiple imputation of missing values. The results were consistent with the results of the imputed primary analysis, thus confirming the robustness of the findings.

### Women who had experienced transfer

Eleven FMU women were transferred during labour to an OU, with slow progress of labour as the most common indication. Another five women were transferred <2 h after birth because of maternal bleeding or large perineal lacerations. Ten of the transferred women (62.5%) gave their birth experience a score of 6 or 5 (outstanding/very positive), three (19%) indicated a score of 4, and scores of 3 or 2 were given by three women (19%). No subgroup analysis was performed due to the small number of cases.

### Adjustment for the influence of medical birth factors

Medical data on birth outcomes were collected from medical records as part of the overall cohort study. Comparison of medical outcomes is reported in (Overgaard, Møller, Fenger-Grøn, Knudsen, & Sandall, 2011). With birth experience treated as a dichotomous outcome, control for medical birth factors (Apgar score, transfer to neonatal ward, birth interventions, and epidural analgesia) was performed using a multiple logistic regression model. Adjustment for medical factors slightly increased the positive influence of FMU care on women's birth experience from OR: 3.9; 95% CI: 2.1,7.3 to OR: 4.0; 95% CI: 2.0,8.2.

### The influence of socio-demographic factors on birth experience

In a subgroup analysis the influence of dichotomised variables on parity, age, education, and employment was tested by logistic regression. Women with no post-secondary education represented the most socio-economically disadvantaged group with some women receiving social benefit, incapacity benefit, or benefit for refugees. These women were included in the wider group of women characterised by a low level of employment, defined as jobs requiring no college/university education.

Table 4 shows an overall significant, negative effect of "no post-secondary education" (OR: 0.4, 95% CI: 0.2,0.8) and "low level of employment" (OR: 0.5, 95% CI: 0.3,0.97) on birth experience. However, individual analyses of the two groups showed a significant effect only for the OU group (no post-secondary education: OR: 0.35, 95% CI: 0.16,0.8; low level of employment: OR: 0.3, 95% CI: 0.1,0.6). No effect of age or parity was found, whether overall or for individual groups.

**Table 3**  
Birth experience and women's perceptions of patient-centred care elements.

	FMU/OU Mean <sup>b</sup>	FMU/OU N/N	Wilcoxon sign-rank test		
			N complete pairs before/after imputation		P-value <sup>a</sup>
Overall birth experience	5.5/5.0	185/190	165	210	0.0000
Care satisfaction	5.7/5.3	185/190	165	210	0.0000
Support from midwife	5.7/5.4	182/190	162	210	0.0000
Midwife present when wanted	5.7/5.4	182/189	161	210	0.0000
Attention to psychological needs	5.4/4.9	177/180	149	208	0.0000
Feeling of being listened to	5.4/5.0	180/188	159	209	0.0000
Level of information	5.4/4.9	183/187	162	208	0.0000
Participation in decision-making	5.4/5.0	176/180	148	208	0.0000
Consideration for birth wishes	5.6/4.9	107/120 <sup>d</sup>	58	169	0.0000
Suggestions for pain-relief	5.3/4.7	106/120 <sup>d</sup>	57	169	0.0038
Staff support for partner	5.3/5.0	174/179	144	209	0.0013
Undisturbed contact with newborn	5.8/5.6	184/188	162	210	0.0026
Support provided by partner	5.1/5.2	182/188	160	210	0.3408
Loss of control over labour/reactions	0.1/1.2 <sup>c</sup>	179/190	159	210	0.0310
Loss of control over staff actions	0.2/0.5 <sup>c</sup>	181/188	159	210	0.0061

<sup>a</sup> The test results are based on imputed data. Level of significance adjusted to  $P < 0.0025$  after Bonferroni correction.

<sup>b</sup> 6-point scale: 1 (unacceptable) and 6 (optimal).

<sup>c</sup> 5-point scale: 0 (no loss) and 4 (control lost all through birth).

<sup>d</sup> High number of women in both groups marked the "did-not-have-any/did-not-need-it"-category.

**Table 4**  
Influence of socio-demographic factors on birth experience.

	N	OR (CI)	OR (CI)	OR (CI)
		FMU	OU	All
Primiparity	87	0.8(0.2–2.6)	0.5 (0.3–1.1)	0.6(0.3–1.1)
>30 years old	152	0.9 (0.3–2.6)	1.9(0.96–3.6)	1.5(0.9–2.5)
No post-secondary education	72	0.5(0.1–1.4)	0.35(0.16–0.8) <sup>a</sup>	0.4(0.2–0.8)
Low level of employment	233	1.9(0.7–5.6) <sup>b</sup>	0.3(0.1–0.6) <sup>a</sup>	0.5(0.3–0.97)

<sup>a</sup> The influence of no post-secondary education and low employment level is significant only in the OU setting.

<sup>b</sup> A positive trend for the influence of low employment level is seen in the FMU group.

#### Care experiences of socio-economically disadvantaged women

Exploring the effect of no post-secondary education on women's perceptions of psycho-social care elements, we found significant, overall negative effects with regard to midwifery support (OR:0.3, 95% CI:0.2–0.7), information (OR:0.3, 95% CI:0.2,0.5), feeling of being listened to (OR:0.3, 95% CI:0.1,0.7), consideration for birth wishes (OR:0.3, 95% CI:0.1,0.6), presence of midwife when wanted (OR:0.3, 95% CI:0.2,0.7), and care satisfaction (OR:0.3, 95% CI:0.2,0.7).

No overall effects were found for participation in decision-making, attentiveness towards psychological needs, suggestions for pain relief, or loss of internal or external control.

In regard to the FMU group a significant, negative effect was found only for two outcomes: information (OR:0.3, 95% CI:0.1,0.5) and the feeling of being listened to (OR:0.3, 95% CI:0.09,0.9). In the OU group the significant, negative effect persisted for all six care elements mentioned above: midwifery support (OR:0.3, 95% CI:0.09,0.8), information (OR:0.2, 95% CI:0.1,0.5), feeling of being listened to (OR:0.3, 95% CI:0.1,0.7), consideration for birth wishes (OR:0.3; 95% CI:0.1–0.6), presence of midwife when wanted (OR:0.3, 95% CI:0.1,0.8), and overall care satisfaction (OR:0.2, 95% CI:0.08,0.5).

In exploring the effect of low employment level we found no significant, negative effect for any psycho-social care element or for care satisfaction in the total group of women or among FMU women. As for birth experience, the primary outcome, a non-significant trend towards positive effects was observed among FMU women for: midwifery support, feeling of being listened to, consideration for wishes, participation in decision-making, and care satisfaction. In the OU group, a significant, negative effect of low employment level was found for midwifery support (OR: 0.3; 95% CI:0.09,0.8), feeling of being listened to (OR:0.3; 95% CI:0.1,0.8), and consideration for birth wishes (OR:0.4; 95% CI:0.2,0.9).

#### Discussion

The perspective and experience of service users and patients are taking centre stage across a variety of national health care services, including maternity care. However, in spite of wide scale initiatives to humanise and individualise care, negative birth experience remains a problem for many women (Waldenstrom et al., 2006; White et al., 2006).

We examined the influence of birthplace on women's birth experiences and perceptions of care in two different birth settings: two freestanding midwifery units and two obstetric units in north Denmark, both pursuing an ideal of high-quality, humanistic and patient-centred care.

Among the key strengths of our study is the high response rate (86%), equal representation of FMU and OU participants, and

complete data on socio-demographic background and medical history. To date the study is one of the largest published to compare birthing women's experiences of care in FMUs versus OUs. The women were all prospectively categorised as low-risk and were cared for in a public health care system where patient ability-to-pay is not a concern. Moreover, both settings were well-established parts of the public maternity care system and followed identical practice guidelines, with midwives as the primary care provider.

One limitation of our study is its observational (non-randomised) design, which does not allow for the elimination of all potential confounding factors. Although the two groups were closely matched on a large number of potential confounding factors, unknown factors relating to women's self-selection to birth setting may play a role. Neither were we able to take into account the effect of women's birth expectations on their actual experiences.

Another limitation is the use of a not previously validated questionnaire that may potentially provide less reliable information than a questionnaire that has been validated in other studies and settings. Furthermore, it reduces the comparability of our results to the results of other studies. We did not find a validated tool that fitted the study aims well. On the positive side, the development of a questionnaire enabled us to tailor the questionnaire to the setting in which it was to be implemented and to take into account user experiences, opinions, priorities and suggestions. Careful pilot testing of the questionnaire strengthened the content validity and reliability, and high internal content consistency was indicated by Cronbach's alpha.

A further issue to be noted is the generally recognised effect of respondents' reluctance to express negative or critical views in patient surveys (Lumley, 1985). To meet these challenges, data collection took place four weeks after birth to allow women time for reflection on their experiences and to increase the likelihood of full reporting of views (Simkin, 1991). By eliciting women's assessment of key patient-centred care elements before their overall assessment, recall of memories was supported and a more nuanced assessment of the overall birth experiences and satisfaction with care facilitated (Olsen, 2001). Finally, to reduce the risk of underestimation of negative experiences due to the underrepresentation of certain patient subgroups (Brown & Lumley, 1997), we used multiple imputation of missing data.

The present study of two groups of women who had made their own choice of birthplace and had midwives as their primary care givers, has confirmed the positive outcomes of FMU care reported by several earlier, mainly qualitative, studies. We found FMU care to be associated with significantly more positive experiences of birth and better satisfaction with care. Women in the FMU group felt better informed and more listened to and reported better opportunities for participating in decisions about care compared to women in the OU group. Furthermore, FMU midwives were perceived to be more supportive of both the woman and her partner, more attentive towards the woman's psychological needs and her wishes for birth, and they were more likely to be present when wanted. As respondents generally give positive evaluations of care models which they themselves have chosen and with which they feel familiar (Teijlingen, Hundley, Rennie, Graham, & Fitzmaurice, 2003; Walker et al., 1995), and midwives were the lead carer in both settings of this study, we expected to find fewer or only minor differences in comparison to earlier studies, but were surprised by the high number of significant differences. Although the two types of unit shared the goal of providing patient-centred, family-friendly care, the FMUs are therefore judged to provide higher quality care as measured by women's experiences.

We investigated a range of psycho-social aspects of care and found significant differences between groups in several cases, most notably for: carer's attentiveness to psychological needs and wishes



for birth, feeling of being listened to, and information. The findings suggest that FMU midwives focused attention towards psychological dimensions of childbirth, good communication and involvement of the women and her partner and thus improved their ability to provide patient-centred, individualised, and supportive care.

The significance of a home-like physical environment, and its influence on psychological well-being, behaviour and expectations of users and staff, has previously been emphasised (Fannin, 2003). The FMUs in the present study offered more spacious and tranquil facilities compared to the OUs, but the differences in decor and equipment between units were so negligible that no differences in care quality should be ascribed to them. For example, both FMUs and OUs had water tubs and small birthing rooms with obstetric beds, but a home-like use of the unit's facilities and ambulation during labour were encouraged only in the FMUs. The key difference between FMUs and OUs may therefore lay not so much from the physical facilities but in the FMU culture that encouraged their use by the women, their companions and staff.

FMU care is a complex intervention and present study did not allow a further exploration of the FMU culture, the characteristics of the midwives working in the compared settings, or the underlying mechanisms leading to improved birth experience in the FMU group. Still, we would indicate as influencing factors increased continuity, including greater availability of one-to-one care and continuous support during labour that has been shown to be related to improved birth experience (Hodnett, Gates, Hofmeyr, Sakala, & Weston, 2011). Increased job satisfaction as a positive consequence of midwives working in a team model (Hundley et al., 1995; Turnbull, Reid, McGinley, & Shields, 1995) may also be important along with general organisational characteristic of FMUs, facilitating midwives' development of meaningful and caring relationships with women and their families, as suggested by Walsh (2006).

FMU care was significantly associated with very positive birth experiences for women with low levels of education and in particular for the wider group of women with a low level of employment. This finding is supported by a recent Swedish survey, which also reports a negative correlation between no post-secondary education and negative birth perceptions (Wilde-Larsson et al., 2011). "Working-class" women have been found to entertain a fatalistic approach to childbirth (Zadoroznyj, 1999), show little interest in psycho-social aspects of birth such as the experience of fulfilment, and to be more inclined to hand over control to the professionals and accept pain-relieving drugs. However, Green and Baston (2003), Green et al. (1998) have challenged this as a stereotyped view of both "working-class" and "middle-class" women's wishes and needs during childbirth. They found that education had little influence on women's perceptions of birth and intrapartum care, including their attitudes to the use of drugs during labour and control issues. As pointed out by Lazarus (1994), underprivileged women may feel constrained by the social conditions under which they become mothers, indicating that the important differences associated with education/social class may be differences in access to and understanding of information and the ability to transform knowledge into personal control and/or power over own care. Our view is that FMU care provides an opportunity to mitigate social disadvantage which results in significantly improved birth experience for this group of women.

Although Denmark, with its comprehensive welfare system, is among the countries with the highest degree of equality, socio-economic disadvantage persists and lifelong inequality in health, with its close links to social differences in education, employment and income is defined as a major, national challenge (Diderichsen, Andersen, & Manuel, 2011). We find it likely that the least privileged/least educated of the women in our study benefit the most

from a patient-centred care approach that emphasises communication and emotional support. Our finding, that women with no post-secondary education had significantly more negative perceptions of information provided and the feeling of being listened to, indicates the potential for further improvement, even in the FMUs. In a service development perspective, the potential of FMU care to mitigate the effect of social disadvantage on women's birth experience is promising, and we strongly recommend further investigation of this issue.

Overall, this study provides strong support for FMU care, even in settings where all frontline care is provided by midwives and where the humanistic paradigm of childbirth and patient-centred care is prevalent, as was the case in the North Denmark Region. The results show that FMU care offered important psycho-social benefits for birthing women and was associated with significantly better birth experiences and higher satisfaction with care, compared to OU care. Specific care elements, including information, the feeling of being listened to, and the opportunity to participate in decisions about care, were rated significantly higher by FMU women than by OU women; moreover, FMU women perceived their midwives as more supportive and more attentive towards their psychological needs and wishes for birth.

The findings contradict the view that "working-class" and "middle-class" women are attracted by different childbirth models and entertain different expectations, wants, and needs during childbirth. The potential of FMU care to alleviate the effect of social disadvantage on women's birth experience is promising and should be further investigated. Moreover, our study underlines the importance of truly individualised and supportive care that accommodates the needs of all birthing women, including their need for information and for being listened to, and the challenges in providing such care, especially in conventional settings. Policy makers and professionals face the task of considering how the concept of FMU care can be applied in the effort to improve women's birth experiences and develop maternity care services, and possibly also the effort to combat the effect of social inequality on health.

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