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Interdisciplinary consultation and birth plan in a doctor-midwife clinic: A mixed-methods study of obstetric, maternal, and neonatal outcomes as well as women's birth experiences

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Abstract

Introduction: In response to an increased elective caesarean section (CS)-rate, North Denmark Regional Hospital (RHN) implemented a new policy in 2018, detailing that women can no longer obtain a CS solely on maternal request. Therefore, a doctor-midwife clinic was implemented to provide interdisciplinary consultations with a midwife and an obstetrician to address fear of childbirth (FOC) and develop a birth plan aimed at a vaginal delivery. The study aimed to evaluate different outcome measures of the clinic at RHN between June 2020 and May 2025 on elective CS-rate, maternal and neonatal health, and women's acceptability and satisfaction.

Methods: A convergent parallel mixed methods cohort design was used. Quantitative data were obtained through review of medical records and the Childbirth Experience Questionnaire (CEQ). Qualitative data were obtained from semi-structured interviews of ten women.

Results: The elective CS-rate was not reduced between 2021 and 2024. 71.3% of the cohort had a vaginal delivery, significantly more for multiparous than nulliparous women and women with previous CS (96.0% vs. 67.9% and 51.3%) ($p < 0.001$). Common characteristics of women referred to the clinic were fertility treatment, smoking, multiparity, including several common previous birth characteristics. Common reasons for FOC were "Previous traumatic birth experience", and "Fear of prolonged labor" in addition to "Previous insufficient communication". Overall CEQ-score was lower compared to the obstetrical reference group. However, interviews revealed that the consultation and the birth plan contributed positively to women's birth experiences, when involvement, mutual accommodation, emotional and professional acknowledgement, continuity, and clear communication were ensured.

Conclusion: Identified characteristics may aid in identifying women that are at risk of FOC and who may benefit from a referral to the clinic. Findings indicate that the clinic has a positive effect on women's acceptability and satisfaction with the consultation, the birth plan, and the birth experience. However, as maternal outcomes are more affected compared to the obstetrical reference group, this questions whether the clinic can further reduce the elective CS-rate without compromising maternal health.

1. Introduction

Since the 1990s, caesarean section (CS)-rates have been steadily increasing globally [1]. In Denmark, the CS-rate has increased by 49% between 1998-2015 [2], however, since 2015, the CS-rate has remained steady at 20-21%, approximately half of these CS are elective [3, 4]. This increase can be attributed to several reasons, one being elective CS on maternal request [5, 6].

When medically necessary, a CS can be a lifesaving intervention, reducing maternal and perinatal mortality and morbidity. However, the use of CS when medically unjustified has not shown any maternal or perinatal benefits [7, 8]. WHO suggests a CS-rate of 10-15%, as this is associated with reduced maternal and neonatal mortality. Conversely, CS-rates above this range are not associated with a reduction in mortality, but CS-rates below this range are associated with an increased maternal and neonatal mortality [1, 8].

Both emergency and elective CS are associated with short- and long-term complications for both mother and child [9-13] including an increased risk of CS in the subsequent pregnancy [12]. Despite many complications, elective CS has shown psychological benefits for the mother including a perceived sense of safety, reduced anxiety related to delivery, and an increased mental capability postpartum [14, 15]. This has contributed to the increased proportion of non-medically indicated elective CS, including maternal request [16, 17]. Research shows that the most common reason for maternal request CS is fear of childbirth (FOC) regardless of parity [14, 18]. FOC describes a “disabling fear that interferes with occupational and domestic functioning, as well as social activities and relationships” [19] and is associated with fear of repetition of previous traumatic or negative birth experience [18], of own or child’s life, of extreme pain, of lack of control [14], or related to a history of abuse and more [18].

In response to an increased elective CS-rate, North Denmark Regional Hospital (RHN) implemented a new policy in 2018, detailing that women can no longer obtain a CS on maternal request. To the authors’ knowledge, a similar policy has only been implemented at Hospital of Southern Jutland (HSJ), Denmark in 2008, where a midwife is solely responsible for the consultation. The aim of this study was therefore to evaluate different outcome measures of the doctor-midwife clinic at RHN by examining the characteristics of women referred to the clinic, by assessing if the clinic has reduced the elective CS-rate without compromising maternal and neonatal health, and by exploring the acceptability and satisfaction of the consultation, the birth plan, and the birth experience.

2. Methods

Context and setting

The doctor-midwife clinic consists of two teams, providing interdisciplinary consultations with a midwife and an obstetrician for women requesting an elective CS or women with FOC. During the consultation, the women's obstetric history is reviewed, reasons for referral and concretization of FOC are addressed, and a birth plan is developed collectively aimed at a vaginal delivery [20, 21]. The study was conducted at the Department of Gynaecology and Obstetrics (OB/GYN), RHN between June 2020 and May 2025.

Study design

The study employed a convergent parallel mixed methods cohort design, mixing quantitative analysis of the women's characteristics, maternal and neonatal outcomes, delivery methods, and women's birth experiences with qualitative analysis regarding their experiences at the clinic and subsequent birth experiences to achieve a triangulated analysis. Data was collected concurrently and analysed independently before being integrated to provide a more holistic understanding of the clinic from the women's perspectives. This approach allows for a more comprehensive understanding of a complex situation and validation of findings with each other, thus strengthening the overall validity of the findings [22].

The two-step quantitative phase consisted of 1) a review of medical records, and 2) a survey on the women's birth experiences.

The qualitative phase consisted of semi-structured interviews regarding the acceptability and satisfaction of the consultation, the birth plan, and the birth experience with a subset of participants from the quantitative study. Integration of findings was done by presenting the quantitative study followed by the qualitative study. The relative priority of approaches was equal as both data sets were equally important for the aim [22].

Quantitative phase

In the quantitative phase, the aim was to characterize women referred to the clinic, to assess if the clinic has reduced the elective CS-rate without compromising maternal and neonatal health, and to evaluate the women's birth experiences.

Participants

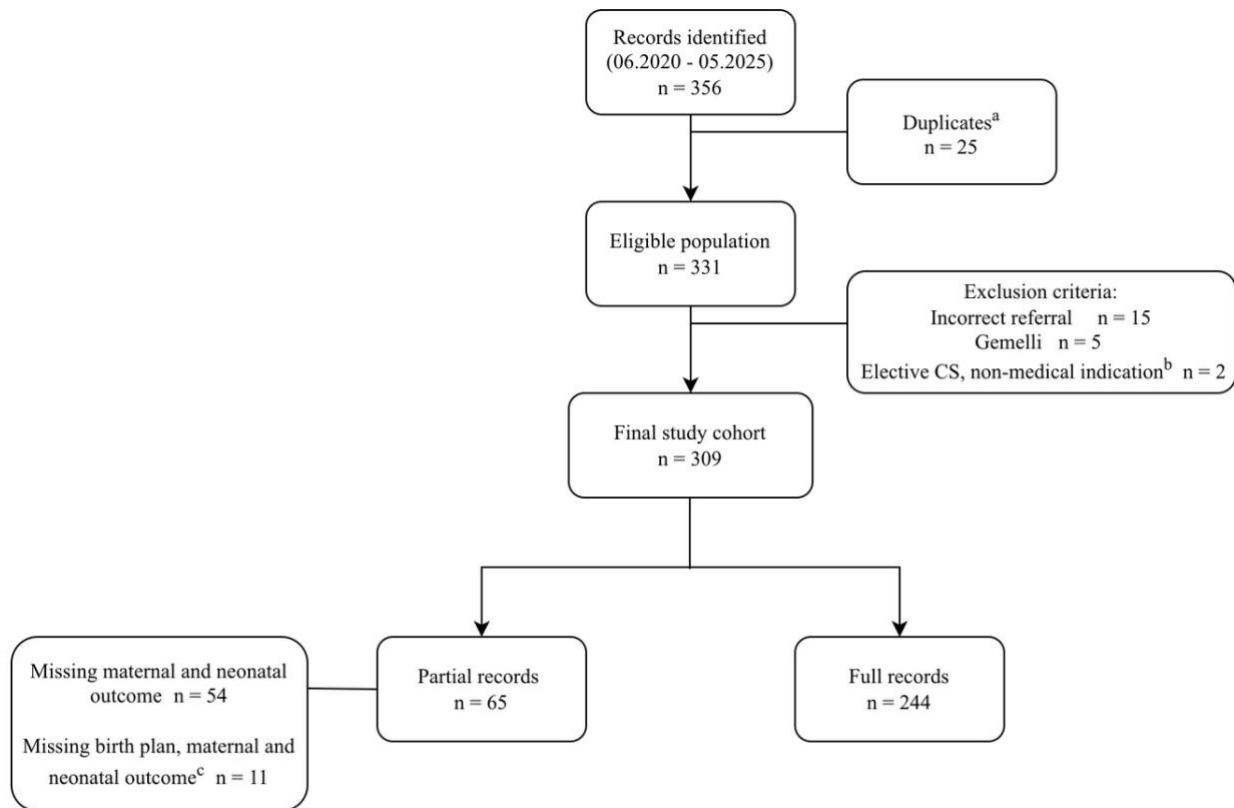
Step 1: Review of medical records

Women with FOC or maternal request for CS attending consultations at the doctor-midwife clinic between June 2020 and May 2025 were included. Exclusion criteria were incorrect referrals (women without FOC, medically justified elective CS, or postpartum consultation), gemelli pregnancies, and non-medically justified elective CS (Figure 1). Missing data on birth plan, and maternal and neonatal outcomes represent 11 women who chose to leave RHN because of the policy.

The study utilized women giving birth at RHN from 2020 to 2024 as a control group for comparison, referred to as the obstetrical reference group. Data does not allow for separation

of the study cohort from the reference group; therefore, the reference group also includes the study cohort.

Figure 1. Flowchart describing participants in step 1: Review of medical records.



^a Women who appeared twice in the dataset, but only had one consultation at the doctor-midwife clinic.

^b One without any apparent reason documented. One on maternal request due to a language miscommunication.

^c 11 women chose to leave RHN as a result of the policy.

Step 2: Childbirth Experience Questionnaire (CEQ)

Women with FOC or maternal request CS attending consultations at the doctor-midwife clinic between June 2020 and May 2025 were included. There were no exclusion criteria.

The questionnaire was distributed to 328 women as women who appeared twice in the dataset only received one questionnaire. Of these, 117 responded, however 34 women did not complete any questions beyond giving consent, resulting in a final cohort of 83 women (25.30%) with 72 ‘Completed Survey Response’ and 11 ‘Partial Survey Response’.

Procedure and data collection

Step 1: Review of medical records

Data collection took place in September and October 2025 from OB/GYN, RHN. In accordance with predefined research questions, medical records were reviewed twice distributed between authors, and if in doubt reviewed by all authors and in collaboration with two clinical supervisors, an obstetrician from the doctor-midwife clinic and a midwife from OB/GYN, RHN. A data extraction sheet was created prior to the review to ensure accuracy and

consistency throughout data extraction. Data was recorded using Microsoft Excel on the hospital's secure data management platform.

Characteristics were obtained from the antenatal record and the first midwife consultation. Characteristics of previous births were selected based on the Danish Healthcare Quality Institute's database for births [23] and clinical expertise of the supervisors. Characteristics describing FOC were selected as outlined in relevant policies for the clinic [21], and content of birth plans were defined according to the clinical experience of the supervisors. Additional themes and variables identified were incorporated inductively as recurrent patterns emerged.

Variables describing maternal and neonatal outcomes were selected based on the Danish Healthcare Quality Institute's database for births, pre-existing literature, and clinical expertise of the supervisors [23-25].

See Appendix A for definitions of selected variables.

Step 2: Childbirth Experience Questionnaire (CEQ)

Data collection took place in September and October 2025. The Danish version of the CEQ was used to evaluate women's birth experiences [26] with an additional section on baseline and obstetrical characteristics based on previous studies utilizing CEQ to enable comparison [27].

Participants were invited to complete the survey via secure email sent by OB/GYN, RHN, using the Research Electronic Data Capture (REDCap) platform [28]. Non-responders received two separate reminders via secure email after two and four weeks, respectively.

CEQ is a validated questionnaire, containing 22 statements evaluating three domains of the childbirth experience: "Own capacity", "Participation", and "Professional support". For 19 of the 22 items the response format is a 4-point Likert scale ranging from "Totally disagree" to "Totally agree", where higher ratings reflect a more positive experience. For the remaining three items describing the response format is a visual analogue scale changed for categorical values: 0-40 = 1, 41-60 = 2, 61-80 = 3, and 81-100 = 4 [26].

Data analysis

All statistical analyses were performed and recorded using Stata statistical software, version 17.0 (StataCorp, College Station, TX, USA) through RHN's licence on the hospital's secure data management platform. Preliminary analyses were conducted to ensure data completeness and variable distributions for subsequent analyses.

Step 1: Review of medical records

Descriptive statistics were used to describe sociodemographic characteristics, previous births, characterization of FOC, content of birth plans, and maternal and neonatal outcomes. For continuous variables, mean and standard deviation (SD) were used for normally distributed variables, while median and interquartile range (IQR) were used for non-normally distributed variables. Categorical variables were expressed as numbers and percentages (%).

Categorical variables were compared using Chi-square-tests of independence. When comparing more than two categorical variables and statistically significant results were found, post-hoc analysis was performed. Corrections for multiple comparisons were performed using the Benjamini-Hochberg false discovery rate (FDR) method. Data from North Denmark Region BI & Analysis [29] and Danish Health Data Authority [30] was used to describe the obstetrical reference group and to identify a possible correlation between referrals to the clinic and number of deliveries at RHN.

Step 2: Childbirth Experience Questionnaire (CEQ)

Descriptive statistics were used to describe sociodemographic characteristics, previous births, and CEQ-scores. For continuous variables, mean (SD) were used for normally distributed variables, while median (IQR) were used for non-normally distributed variables. Categorical variables were expressed as numbers (%).

To identify a possible difference in CEQ-scores depending on characteristics, interventions during delivery, and birth outcomes, independent two-sample t-tests were performed for normally distributed variables, otherwise a Mann-Whitney U-test was performed. Kruskal-Wallis tests were used to identify a possible difference in CEQ-scores depending on BMI and educational level.

For all statistical tests, statistical significance was defined as a p-value or adjusted p-value $p < 0.05$.

Qualitative phase

In the qualitative phase, the aim was to evaluate the effect of the doctor-midwife clinic on women's acceptability and satisfaction regarding the consultation, birth plan, subsequent birth experience, and their reflections on the experience in the clinic including areas for improvement.

Participants

Recruitment took place at the clinic between February and October 2025. The women received oral and written information about the study, and 22 women provided a statement of consent, permitting the authors to contact them by phone postpartum to ask their participation in an interview regarding their experiences. In October, women were contacted to confirm consent and schedule interviews.

Eligible women were defined as women attending consultations at the clinic between February and October 2025 including those who underwent a CS. Women who did not give birth before November 2025 or at RHN were excluded.

The objective was to conduct 10 semi-structured interviews, as this was found to appropriately represent the cohort's experience considering the allocated time. This decision was made prior to conducting interviews and in collaboration with the supervisors. Therefore, 14 women were contacted, two did not respond, one was ineligible, and one declined to participate, resulting in a final study population of 10 women. All participants were multiparous

women between the ages 27-37 years, with various living situations, occupational status, and method of deliveries.

Procedure and data collection

Inspired by the qualitative interview research by Kvale and Brinkmann [31], an explorative design was decided upon, and semi-structured individual interviews were conducted. An interview guide was developed based on the clinical experience of the supervisors. It included questions regarding the 1) consultation in the clinic, 2) birth plan, 3) birth experience, and 4) reflections on their experience in the clinic including advice for the clinic and other women referred regarding potential areas for improvement. A total of five main questions and 17 elaborative open-ended questions were composed to guide the interview and allow for reflection. Probes and specifying questions were added where helpful [31].

The first interview served as a pilot test for the interview guide and for the role of the interviewer. Minor adjustments to questions on areas for improvement were made accordingly in collaboration with the supervisors, and this interview was subsequently incorporated in data analysis.

All authors took turns facilitating the interviews with one acting as the primary interviewer and one as an observer making field notes. Following the interview guide, 10 semi-structured interviews were conducted in October 2025: seven online meetings with visual and three without visual using Microsoft Teams on the hospital's secure data management platform. The interviews lasted between 35 to 60 min., were audio-recorded, transcribed verbatim, and subsequently analysed by the authors.

All authors were female medical students ages 27-29 years with no prior experience or training conducting semi-structured interviews. All authors shared a theoretical preunderstanding of the clinic obtained through supervisors and medical journal reviews as well as a theoretical preunderstanding of how to conduct qualitative interviews obtained through literature research [32-35]. No relationship between the interviewers and interviewees was established prior to the study commencement, however the interviewees were informed about the interviewers' name, age, profession, and reasons for conducting the study. The COREQ checklist (Consolidated criteria for Reporting Qualitative research) was used to guide the study reporting [36].

Data analysis

The authors performed a pilot study with transcripts of three interviews to determine an appropriate analytical approach for thematic analysis in collaboration with the supervisors. The analysis was inductive based, however because of the amount of data, the transcripts were divided into the following three areas in accordance with the interview guide: 1) consultation in the clinic, 2) birth plan, and 3+4) birth experience and reflections on their experience in the clinic. Analysis was therefore also deductive. Advice and recommendations were analysed separately.

Analysis of interviews were done using Braun and Clarke's Steps of Thematic Analysis [37]. Initially, the transcripts were read to obtain a sense of the full material and afterwards the

transcripts were read line by line. It was a dynamic process between understanding specific parts of the interview and the whole of the interview. Sentences and paragraphs for each area were identified, and data extracts were coded together by the authors with the intent to establish a similar coding frame. After evaluating this approach with the supervisors, the remaining seven interviews were coded independently by each author, whereafter consensus on codes was obtained. To strengthen trustworthiness, all authors took part in the process of analysis [38]. Open codes were grouped into potential subthemes within each area, which were then reevaluated, and grouped into overarching themes across the three areas (1, 2, 3+4). Visual representations of the codes, subthemes, and themes were arranged in colours and tables. Several iterations of analysis were done by frequently reevaluating codes, subthemes, and correlations between subthemes to ensure the codebook, subthemes, and overarching themes best possible reflected the interviews. Analysis was concluded when the authors agreed that the overarching themes represented the interviews.

Danish interview quotations were translated into English using an AI-assisted translation tool (ChatGPT, OpenAI). All translations were subsequently reviewed and validated by the authors to ensure accuracy and preservation of meaning.

Ethical approval

The study was reviewed and approved through a proxy consent by the medical director at RHN to review of medical records and registered as quality improvement projects (K2025-095, K2025-096, K2025-097). None of the authors have any affiliation with the doctor-midwife clinic. This study followed the Declaration of Helsinki and written informed consent was obtained from all participants. Data collected was anonymized and stored in accordance with RHN's guidelines.

3. Results

Quantitative phase

Table 1 displays the cohort’s sociodemographic and obstetric characteristics of the study cohort (n=309) compared to the obstetrical reference group (n=6865). The cohort and the obstetrical reference group differed in multiparity, smoking, and fertility treatment, as well as emergency CS, PPH, severe perineal tear, instrumental delivery, shoulder dystocia, and episiotomia. All variables were overrepresented in the cohort.

Table 1. Sociodemographic and reproductive health characteristics in the study cohort in comparison to the obstetric reference group.

	Study cohort n = 309	Obstetrical reference group n = 6865		Study cohort n = 274	Obstetrical reference group n = 6865
Maternal age (years) ^a , mean (SD)	31.18 (4.0)	29.99 (0.9)	CS		
BMI (kg/m2), median (IQR)	26.3 (23.4 - 30.7)	-	Emergency CS	133 (48.5)	830 (12.1)
BMI classification ^a			Elective CS, medical indication (obstetric)	15 (5.5)	
Underweight < 18.5	4 (1.3)	190 (2.8)	Elective CS, medical indication (somatic)	5 (1.8)	348 (6.0) ^g
Healthy weight, BMI 18.5 - 24.9	115 (37.2)	3240 (47.2)	Elective CS, non-medical indication	5 (1.8)	
Overweight, BMI 25 - 29.9	85 (27.5)	1820 (26.5)	Intrapartum/neonatal morbidity ^g		
Obesity, BMI > 30			Yes	66 (24.1)	-
Class 1 Obesity, BMI 30 - 34.9	47 (15.2)	915 (13.3)	No	208 (75.9)	-
Class 2 Obesity, BMI 35 - 39.9	28 (9.1)	440 (6.4)	PPH > 1000 mL		
Class 3 Obesity (severe obesity), BMI > 40	12 (3.9)	205 (3.0)	Yes	59 (21.5)	697 (10.2)
Missing data	18 (5.8)	49 (1.7)	No	215 (78.5)	6168 (89.9)
Parous			Instrumental delivery ^c		
Nulliparous	35 (11.3)	2820 (41.1)	Yes	56 (20.4)	135 (5.0)
Multiparous	274 (88.7)	4041 (58.9)	No	218 (79.6)	2555 (95.0)
Missing data	0 (0.0)	4 (0.1)	Episiotomy ^c		
Living situation			Yes	27 (9.9)	152 (5.7)
Cohabiting	241 (78.0)	-	No	247 (90.2)	2538 (94.4)
Living alone	14 (4.5)	-	Severe somatic complications related to pregnancy/birth ^g		
Missing data	54 (17.5)	-	Yes	25 (9.1)	-
Language ^e			No	249 (90.9)	-
Danish	301 (97.4)	-	Postpartum reaction/depression		
Other	8 (2.6)	-	Yes	25 (9.1)	-
Occupation, maternal ^b			No	249 (90.9)	-
Employed	237 (76.7)	-	Perineal tear III or IV		
Unemployed	34 (11.0)	-	Yes	21 (7.7)	96 (1.4)
Outside the workforce	21 (6.8)	-	No	253 (92.3)	6769 (98.6)
Missing data	17 (5.5)	-	PE/HELLP syndrome		
Occupation, partner ^b			Yes	19 (6.9)	285 (4.2)
Employed	267 (86.4)	-	No	255 (93.1)	6580 (95.9)
Unemployed	4 (1.3)	-	Shoulder dystocia ^c		
Outside the workforce	10 (3.2)	-	Yes	11 (4.0)	16 (0.6)
Missing data	28 (9.1)	-	No	263 (96.0)	2674 (99.41)
Smoking status ^c			IUGR		
Yes	36 (11.7)	147 (5.5)	Yes	6 (2.2)	-
No	263 (85.1)	2543 (94.5)	No	268 (97.8)	-
Missing data	10 (3.2)	0 (0.0)	Foetus mortuus/2 nd trimester abortion ^f		
Alcohol use			Yes	5 (1.8)	44 (0.6)
Yes	0 (0.0)	-	No	269 (98.2)	6876 (99.4)
No	296 (95.8)	-	Apgar score < 9 at 5 minutes ^f		
Missing data	13 (4.2)	-	Yes	4 (1.5)	311 (4.5)
Recreational drugs			No	270 (98.5)	6609 (95.5)
Yes	0 (0.0)	-	Preterm labor		
No	296 (95.8)	-	Yes	3 (1.1)	302 (4.4)
Missing data	13 (4.2)	-	No	271 (98.9)	6563 (95.6)
Fertility treatment ^c					
Yes	37 (12.0)	146 (5.4)			
No	272 (88.0)	2544 (94.6)			
Chronic illness					
Somatic disease	57 (18.5)	-			
Mental disorder	31 (10.0)	-			
Both	13 (4.2)	-			
None	199 (64.4)	-			
Missing data	9 (2.9)	-			
Neonatal birth weight (g), mean (SD)	3623.7 (514.1)	3560.6 (530.3) ^d			

Data is presented as mean (SD), median (IQR) or numbers, n (%).

CS: Caesarean section.

PPH: Post partum hemorrhage.

PE/HELLP: Preeclampsia/Hemolysis, Elevated Liver enzymes, and Low Platelet count.

IUGR: Intrauterine Growth Restriction.

^a Body Mass Index, WHO Classification.

^b <https://www.dst.dk/da/Statistik/dokumentation/metode/aku-arbejdskraftundersogelsen>.

^c Only data from 2023-2024. n = 2690.

^d Only data from 2023-2024. n = 2672.

^e Elective CS indications combined (obstetric, somatic and non-medical indication).

^f n = 6920, as gemilli could not be excluded.

^g See Appendix A for definition.

Reasons for referral to the doctor-midwife clinic are displayed to characterize women’s FOC in table 2. “Previous traumatic birth experience” (as stated by the obstetrician) was the most common reason for referral for multiparous women, while “Fear of exacerbation of somatic disease” was the most common amongst nulliparous women. Bivariate analyses were performed comparing nulliparous and multiparous women. Significant results were identified for “Lack of control” (adj. p=0.003) and “Exacerbation of somatic disease” (adj. p<0.001), illustrating a significant overrepresentation of nulliparous women, and “Fear of prolonged labor” (adj. p=0.003) illustrating a significant overrepresentation of multiparous women.

Table 2. Characterization of FOC. Distribution of underlying reasons for referral to the doctor-midwife clinic and bivariate analysis by parity.

	Study cohort n = 309	Multiparous n = 274	Nulliparous n = 35	P-value ¹	Adj. P-value ²
Previous traumatic birth experience	120 (38.8)	120 (43.8) ^a	-	-	-
Avoid prolonged labor	85 (27.5)	84 (30.7)	1 (2.9)	0.001**	0.003**
Previous insufficient communication	57 (18.5)	57 (20.8) ^a	-	-	-
Lack of lack of pain relief	49 (15.9)	40 (14.6)	9 (25.7)	0.090	0.180
Concerns regarding child/mother's life	38 (12.3)	31 (11.3)	7 (20.0)	0.141	0.201
Fear of exacerbation of somatic disease ^b	33 (10.7)	21 (7.7)	12 (34.3)	< 0.001***	< 0.001***
Lack of control	31 (10.0)	22 (8.0)	9 (25.7)	0.001**	0.003**
Fear regarding mental state/disorder ^b	30 (9.7)	24 (8.8)	6 (17.1)	0.115	0.192
Fear of perineal tear	29 (9.4)	24 (8.8)	5 (14.3)	0.291	0.328
PPH	24 (7.8)	24 (8.8)	0 (0.0)	0.068	0.170
Previous sexual assault	9 (2.9)	7 (2.6)	2 (5.7)	0.295	0.328
Fear of emergency CS	8 (2.6)	7 (2.6)	1 (2.9)	0.916	0.916

Data is presented as numbers, n (%).

PPH: Postpartum Hemorrhage.

CS: Caesarean section.

^a Outcome only applicable to multiparous women.

^b See Appendix A for definition.

¹ Chi-square-test.

² P-values FDR-adjusted (Benjamini Hochberg).

** p < 0.01, *** p < 0.001.

Table 3 displays content of birth plans, reflecting what content was important for the women. Study cohort consisted of 298 women as 11 women (3.6%) chose to leave RHN because of the policy. Analysis showed the top three most important content for women was “Sufficient communication”, “Early epidural analgesia”, and “Additional ultrasound”. Bivariate analysis found no significant difference between parity groups.

Table 3. Distribution of contents in the birth plans for the women in the study cohort and a bivariate analysis by parity.

	Study cohort n = 298	Multiparous n = 265	Nulliparous n = 33	P-value ¹	Adj. P-value ²
Sufficient communication	202 (67.8)	181 (68.3)	21 (63.6)	0.589	0.768
Early epidural analgesia	158 (53.0)	143 (53.9)	15 (45.5)	0.356	0.562
Additional ultrasound	140 (46.9)	127 (47.9)	13 (39.4)	0.354	0.562
Progression	128 (42.9)	119 (44.9)	9 (27.3)	0.054	0.270
Team timeout	100 (33.6)	93 (35.1)	7 (21.2)	0.111	0.416
Pp. med.	99 (33.2)	95 (35.9)	4 (12.1)	0.006**	0.090
Continuous CTG	98 (32.9)	95 (35.9)	3 (9.1)	0.002**	0.060
Early admission	95 (31.9)	84 (31.7)	11 (33.3)	0.849	0.910
Other pain relief	58 (19.5)	51 (19.3)	7 (21.2)	0.788	0.876
Nitrous oxide	47 (15.8)	45 (16.9)	2 (6.1)	0.105	0.416
Mobility	44 (14.8)	39 (14.7)	5 (15.2)	0.947	0.947
Postpartum admission	38 (12.8)	36 (13.6)	2 (6.1)	0.222	0.551
Elective CS	35 (11.7)	31 (11.7)	4 (12.1)	0.943	0.947
PPH readiness	31 (10.4)	30 (11.3)	1 (3.0)	0.141	0.470
Gentle delivery	30 (10.1)	26 (9.8)	4 (12.1)	0.678	0.782
Constant staff present	30 (10.1)	23 (8.7)	7 (21.2)	0.024*	0.218
Avoid nitrous oxide	24 (8.1)	23 (8.7)	1 (3.0)	0.261	0.551
Minimal staff present	21 (7.1)	16 (6.0)	5 (15.2)	0.054	0.270
Avoid indecent exposure	19 (6.4)	14 (5.3)	5 (15.2)	0.029*	0.278
Avoid instrumental delivery	15 (5.0)	15 (5.7)	0 (0.0)	0.161	0.483
No students	10 (3.4)	10 (3.8)	0 (0.0)	0.256	0.551
Minimal midwife changes	9 (3.0)	9 (3.4)	0 (0.0)	0.282	0.551
Red card	8 (2.7)	6 (2.3)	2 (6.1)	0.203	0.551
Skin to skin contact	8 (2.7)	8 (3.0)	0 (0.0)	0.312	0.551
Postpartum consultation	8 (2.7)	8 (3.0)	0 (0.0)	0.312	0.551
Water birth	6 (2.0)	5 (1.9)	1 (3.0)	0.659	0.782
Avoid pain relief	6 (2.0)	5 (1.9)	1 (3.0)	0.659	0.782
Avoid pp. med.	6 (2.0)	6 (2.3)	0 (0.0)	0.383	0.574
Avoid epidural analgesia	4 (1.3)	4 (1.5)	0 (0.0)	0.477	0.681
Avoid episiotomy	3 (1.0)	3 (1.1)	0 (0.0)	0.539	0.735

Data is presented as numbers, n (%). Study cohort, n = 298 as 11 women chose to leave RHN as a result of the policy.

Pp. med.: Partus Provocatus Medicamentalis.

CTG: Cardiotocography.

CS: Caesarean section.

PPH: Postpartum Hemorrhage.

¹ Chi-square-test.

² P-values FDR-adjusted (Benjamini Hochberg).

* p < 0.05, ** p < 0.01.

Table 4a outlines methods of intended and final delivery across parity groups to examine how successful the clinic was in planning and achieving a vaginal delivery. The study cohort consisted of 286 women, as 23 women gave birth elsewhere. Elective CS due to non-medical and medical indications were 6.6% and 8.0% respectively, while intended vaginal delivery was 85.3%. Final delivery method for 71.3% was vaginal, and 28.7% was emergency CS with a significant difference across parity groups (p<0.001). Post-hoc analysis found that “Multiparous” with intended vaginal delivery end up with a vaginal delivery more so than the other groups (96.0%) (p<0.001).

Table 4a. Multivariate analysis of intended and final delivery method across parity groups.

Intended delivery	Study cohort n = 286	Multiparous (sectio antea) n = 143	Multiparous n = 111	Nulliparous n = 32	P-value¹
Elective CS, non-medical indication ^a	19 (6.6)	10 (7.0)	7 (6.3)	2 (6.3)	0.972
Elective CS, medical indication ^a	23 (8.0)	16 (11.2)	5 (4.5)	2 (6.3)	0.140
Intended vaginal delivery	244 (85.3)	117 (81.8)	99 (89.2)	28 (87.5)	0.241

Final delivery	Study cohort n = 244	Multiparous (sectio antea) n = 117	Multiparous n = 99	Nulliparous n = 28	
Vaginal delivery	174 (71.3)	60 (51.3)	95 (96.0)	19 (67.9)	$< 0.001^{***2}$ 0.754
Emergency CS	70 (28.7)	57 (48.7)	4 (4.0)	9 (32.1)	
Grade I	2 (2.7)	2 (3.5)	0 (0.0)	0 (0.0)	
Grade II	33 (47.1)	25 (43.9)	2 (50.0)	6 (66.7)	
Grade III	35 (50.0)	30 (52.6)	2 (50.0)	3 (33.3)	

Data is presented as numbers, n (%).

Study cohort for intended delivery, n = 286 as 23 women gave birth elsewhere.

Study cohort for final delivery, n = 244 as only women with intended vaginal delivery were included.

CS: Caesarean section.

Grade I: Delivery within 15 minutes. Grade II: Delivery within 30 minutes. Grade III: Delivery within 60 minutes.

^b See Appendix A for definition.

¹ Chi-square-test.

² Post-hoc pairwise comparison (chi-square-test) with FDR-adjusted p-values (Benjamini-Hochberg):

Nulliparous vs. Multiparous (sectio antea) (p = 0.114).

Nulliparous vs. Multiparous (p < 0.001).

Multiparous vs. Multiparous (sectio antea) (p < 0.001).

*** p < 0.001.

Table 4b outlines maternal and neonatal outcomes for vaginal delivery and emergency CS to examine whether maternal and neonatal outcomes are compromised. The study cohort consisted of 174 women with vaginal delivery and 70 women with emergency CS. For vaginal delivery, a significant difference in the distribution of postpartum perineal tears was found across parity groups (p<0.001). Post-hoc analysis found that “Multiparous” had a significantly different grade of postpartum perineal tear, overrepresented in category ‘None’ and underrepresented in category ‘Grade 2’ (p<0.001). For emergency CS a significant difference was observed in Apgar score at 5 minutes across parity groups (p=0.023). Post-hoc analysis found that a greater percentage of “Multiparous” have children with Apgar score < 7 at 5 minutes (p=0.036), however, notably the group was only composed of four women.

Table 4b. Maternal and neonatal outcomes for vaginal delivery and emergency CS

Vaginal delivery	Study cohort n = 174	Multiparous (sectio antea) n = 60	Multiparous n = 95	Nulliparous n = 19	P-value ¹
Postpartum perineal tear ^a					
None	31 (18.1)	4 (6.7)	26 (28.3)	1 (5.3)	< 0.001*** ²
Grade 1	76 (44.4)	25 (41.7)	42 (45.7)	9 (47.4)	
Grade 2	60 (35.1)	31 (51.7)	22 (23.9)	7 (36.8)	
Grade 3	3 (1.7)	0 (0.0)	2 (2.2)	1 (5.3)	
Grade 4	1 (0.6)	0 (0.0)	0 (0.0)	1 (5.3)	
Total PPH					
0 - 499 mL	125 (71.8)	44 (73.3)	70 (73.7)	11 (57.9)	0.546
500 - 999 mL	31 (17.8)	10 (16.7)	17 (17.9)	4 (21.1)	
1000 - 1499 mL	12 (6.9)	5 (8.3)	4 (4.2)	3 (15.8)	
≥ 1500 mL	6 (3.5)	1 (1.7)	4 (4.2)	1 (5.3)	
Apgar score ≥ 7 at 1 minute ^b					
≥ 7	161 (94.2)	57 (95.0)	87 (94.6)	17 (89.5)	0.650
< 7	10 (5.9)	3 (5.0)	5 (5.4)	2 (10.5)	
Apgar score ≥ 7 at 5 minutes ^b					
≥ 7	169 (98.8)	59 (98.3)	92 (100.0)	18 (94.7)	0.173
< 7	2 (1.2)	1 (1.7)	0 (0.0)	1 (5.3)	
Pediatric admission ^b					
Yes	14 (8.2)	7 (11.7)	4 (4.4)	3 (15.8)	0.121
No	157 (91.8)	53 (88.3)	88 (95.6)	16 (84.2)	
Emergency CS	Study cohort n = 70	Multiparous (sectio antea) n = 57	Multiparous n = 4	Nulliparous n = 9	P-value¹
Total PPH					
0 - 499 mL	16 (22.9)	14 (24.6)	2 (50.0)	0 (0.0)	0.106
500 - 999 mL	39 (55.7)	28 (49.1)	2 (50.0)	9 (100.0)	
1000 - 1499 mL	9 (12.9)	9 (15.8)	0 (0.0)	0 (0.0)	
≥ 1500 mL	6 (8.6)	6 (10.5)	0 (0.0)	0 (0.0)	
Apgar score ≥ 7 at 1 minute					
≥ 7	63 (90.0)	52 (91.2)	3 (75.0)	8 (88.9)	0.575
< 7	7 (10.0)	5 (8.8)	1 (25.0)	1 (11.1)	
Apgar score ≥ 7 at 5 minutes					
≥ 7	68 (97.1)	56 (98.3)	3 (75.0)	9 (100.0)	0.023* ³
< 7	2 (2.9)	1 (1.7)	1 (25.0)	0 (0.0)	
Pediatric admission					
Yes	14 (20.0)	11 (19.3)	2 (50.0)	1 (11.1)	0.258
No	56 (80.0)	46 (80.7)	2 (50.0)	8 (88.9)	

Data is presented as numbers, n (%). Study cohort, vaginal delivery n = 174. Study cohort, emergency CS = 70.

PPH: Postpartum Hemorrhage.

CS: Caesarean section.

^a Three excluded due to missing data.

^b Three excluded due to missing data.

¹ Chi-square-test.

² Post-hoc pairwise comparison (chi-square-test) with FDR-adjusted p-values (Benjamini-Hochberg):

Nulliparous vs. Multiparous (sectio antea) (p = 0.105).

Nulliparous vs. Multiparous (p = 0.036).

Multiparous vs. Multiparous (sectio antea) (p = 0.018).

³ Post-hoc pairwise comparison (chi-square-test) with FDR-adjusted p-values (Benjamini-Hochberg):

Nulliparous vs. Multiparous (sectio antea) (p = 0.689).

Nulliparous vs. Multiparous (p = 0.179).

Multiparous vs. Multiparous (sectio antea) (p = 0.036).

* p < 0.05., *** p < 0.001.

Table 5 presents referrals and method of delivery for women in the clinic from 2021 to 2024. Study cohort is reduced to 238 women, because years 2020 and 2025 are excluded due to partial missing data and because 16 women gave birth elsewhere. A bivariate analysis was conducted to examine whether the number of women referred to the clinic changed over the course of the project period relative to the number of deliveries at RHN and if the clinic reduced the elective CS-rate. The analysis identified an insignificant increase in referrals from 4.3% in 2021 to 5.1% in 2024. Furthermore, the CS-rate did not decrease from 2021 to 2024.

Table 5. Referrals and method of delivery for women in the doctor-midwife clinic 2021 to 2024.

	2021	2022	2023	2024	P-value ¹
Referrals to the doctor-midwife clinic	64 (4.3)	60 (4.4)	63 (4.5)	67 (5.1)	0.784
Method of delivery ^a					
Vaginal delivery	39 (65.0)	36 (61.0)	34 (58.6)	40 (65.6)	
Emergency CS	14 (23.3)	13 (22.0)	14 (24.1)	14 (23.0)	0.987
Elective CS	7 (11.7)	10 (17)	10 (17.2)	7 (11.5)	

Data is presented as numbers, n (%).

CS: Caesarean section.

^a Study cohort, n = 238 as 16 women gave birth elsewhere.

¹ Chi-square-test.

The CEQ was used to evaluate women's birth experiences. Sociodemographic characteristics and characteristics of birth related to the doctor-midwife clinic (n=83) are presented in table 6 to assess if the CEQ-cohort sufficiently represent women referred to the clinic between 2020 and 2025 (n=309). Mean age was 31.2 years (± 4.2), and the majority were multiparous women (75.9%). "Final delivery" was equally distributed between "Vaginal delivery" and "CS".

Table 6. Sociodemographic characteristics and characteristics of birth related to the doctor-midwife clinic.

	Study cohort n = 83
Maternal age (years), mean (SD)	31.2 (4.2)
Gestational age (weeks) ^a , median (IQR)	39.5 (38.0 - 41.0)
BMI (kg/m ²), median (IQR)	27.7 (24.1 - 33.1)
BMI classification ^b	
Underweight < 18.5	0 (0.0)
Healthy weight, BMI 18.5 - 24.9	29 (34.9)
Overweight, BMI 25 - 29.9	22 (26.5)
Obesity, BMI > 30	
Class 1 Obesity, BMI 30 - 34.9	16 (19.3)
Class 2 Obesity, BMI 35 - 39.9	13 (15.7)
Class 3 Obesity (severe obesity), BMI > 40	3 (3.6)
Educational level ^c	
Primary and lower secondary education	2 (2.4)
General upper secondary education	5 (6.0)
Vocational education and training	15 (18.1)
Academy profession programmes (2 - 3 years)	7 (8.4)
Bachelor's and Professional bachelor's programmes (3 - 4.5 years)	43 (51.8)
Master's programmes (candidatus) (5 - 6 years)	11 (13.3)
Parous	
Nulliparous	20 (24.1)
Multiparous, 1 birth	56 (67.5)
Multiparous, 2 births	7 (8.4)
PPH > 500 mL	
Yes	23 (27.7)
No	31 (37.4)
Unsure	29 (34.9)
Epidural analgesia	
Yes	55 (66.3)
No	26 (31.3)
Unsure	2 (2.4)
Duration of labor > 12 hours	
Yes	19 (22.9)
No	50 (60.2)
Unsure	14 (16.9)
Final delivery	
Vaginal delivery	36 (43.4)
Instrumental delivery	5 (6.0)
CS (emergency, elective)	42 (50.6)

Data is presented as mean (SD), median (IQR) or numbers, n (%). Study cohort, n = 83.

BMI: Body mass index.

PPH: Postpartum Hemorrhage.

CS: Caesarean section.

^a Three excluded due to missing data.

^b WHO Classification.

^c Ministry of Higher Education and Science.

To examine if the women's birth experience is dependent upon selected characteristics, table 7 depicts the overall CEQ-score with its domains and the association between CEQ-score and selected baseline characteristics, birth interventions, and birth outcomes. The study cohort study was 72 women as 11 women were excluded because of partial responses. The median overall CEQ-score was 2.9 with a potential maximum score of 4 points. Analysis found a statistically significant higher CEQ-score for "Multiparous" ($p=0.001$) and "Duration of labor>12 hours" ($p=0.014$).

Table 7. The overall Childbirth Experience Questionnaire (CEQ)-score and the association between CEQ-score and selected baseline characteristics, birth interventions, and birth outcomes.

	CEQ-score mean (SD)	CEQ-score median (IQR)	
CEQ overall	2.9 (0.6)	2.9 (2.4 - 3.4)	
Own capacity	2.6 (0.7)	2.7 (1.9 - 3.2)	
Participation	2.7 (0.9)	2.7 (2.0 - 3.3)	
Professional support	3.4 (0.7)	3.7 (3.0 - 4.0)	
	Study cohort n = 72	CEQ-score mean (SD) / median (IQR)	P-value ¹
Age			
≥ 35 years	17 (23.6)	3.12 (0.5)	0.061
< 35 years	55 (76.4)	2.80 (0.6)	
BMI classification ^a			
Underweight, BMI < 18.5	0 (0.0)	0 (0.0 - 0.0)	0.583
Healty weight, BMI 18.5-24.9	23 (31.9)	2.99 (2.6 - 3.4)	
Overweight, BMI 25-29.9	20 (27.8)	2.81 (2.4 - 3.3)	
Obesity, BMI > 30	29 (40.3)	3.03 (2.2 - 3.4)	
Parous			
Nulliparous	18 (25.0)	2.27 (1.9 - 2.9)	0.001**
Multiparous	54 (75.0)	3.14 (2.5 - 3.4)	
Educational level ^b			
Primary and lower secondary education	2 (2.8)	2.39 (2.2 - 2.6)	0.089
General upper secondary education, Vocational education and training, and Academy profession programmes (2 - 3 years)	21 (29.2)	2.64 (2.2 - 3.2)	
Bachelor's and Professional bachelor's programmes (3 - 4.5 years) and Master's programmes (candidatus) (5 - 6 years)	49 (68.1)	3.03 (2.4 - 3.4)	
Duration of labor ^c			
> 12 hours	17 (26.6)	2.58 (0.6)	0.014**
≤ 12 hours	47 (73.4)	2.30 (0.6)	
Final delivery			
Vaginal delivery (incl. instrumental delivery)	39 (54.2)	3.00 (0.6)	0.063
CS (emergency, elective)	33 (45.8)	2.73 (0.6)	
Epidural analgesia ^d			
Yes	48 (67.6)	2.92 (2.4 - 3.4)	0.436
No	23 (32.4)	2.99 (2.5 - 3.6)	
PPH ^e			
> 500 mL	19 (40.4)	2.89 (0.6)	0.452
≤ 500 mL	28 (59.6)	3.01 (0.6)	

Data is presented as numbers, n (%), mean (SD) or median (IQR). Study cohort, n = 72 as 11 were excluded due to 'Partial Survey Response'.

BMI: Body mass index.

CS: Caesarean section.

PPH: Postpartum Hemorrhage.

^a WHO Classification.

^b Ministry of Higher Education and Science.

^c Eight excluded due to missing data, n = 64.

^d One excluded due to missing data, n = 71.

^e 25 excluded due to missing data, n = 47.

¹ Independent two-sample t-tests, Mann-Whitney U-test or Kruskal-Wallis test.

** p < 0.01

Qualitative phase

Thematic analysis identified the following themes. Illustrative quotations support the findings.

Theme 1: Shared objectives and involvement as the foundation for a positive experience in the doctor-midwife clinic

Women described that actively being included in the consultation through dialog and questions, and being offered subject-specific information about both vaginal delivery and CS gave them

a sense of involvement in the consultation and birth plan, which was also reflected during delivery. Most women therefore described their experience in the clinic as positive as the consultation resulted in shared objectives and many were able to enjoy their pregnancy, even if their expectations for maternal request CS were not met:

Ultimately, it was also very much up to me to determine what I felt comfortable with [...]. I was initially concerned about whether I would be able to enjoy this pregnancy, as I feared what might happen during the birth. However, I found that I truly could (interview 1)

Several women emphasized the clinic's flexibility to be important for establishing shared objectives resulting in a positive experience. This included various initiatives in the birth plan, changes in personnel, a second consultation, and for a few women the need for accommodation of a CS. Thus, through mutual flexibility, they were able to establish shared objectives:

They try to adjust their approach in situations like ours, where a consultation goes so wrong that they then attempt to accommodate the individuals involved (interview 2)

As the clinic was able to accommodate and support the women in various ways, mainly through the birth plan, most women (seven) felt a greater sense of safety and changed their minds regarding CS or agreed upon a vaginal delivery:

But when I spoke with X, and he/she explained to me the possible complications associated with a caesarean section [...], I changed my mind. [...]. As I told them, I now felt a sense of safety - and I had not felt that way before (interview 9)

Conversely, some women felt that despite involvement in the consultation, they could not agree to a birth plan or a vaginal delivery and that the department policies were prioritized over their fears, concerns, and right to autonomy. They described it occurred when their request for CS was denied, and when the clinic made decisions without involving the women. This made them feel disregarded, resulting in no sense of safety in a vaginal delivery, and a lack of shared objectives:

I find it difficult to understand the lack of, well, what one might call involvement? Autonomy within such a process [...]. I am aware that it is highly complex, and that political as well as economic factors are involved. But I find it very hard to comprehend why pregnant, vulnerable individuals are put through such a system to attain what they (read: the clinic) consider important (interview 2)

Overall, this theme reflects that a positive experience in the doctor-midwife clinic is dependent upon shared objectives and involvement of all parties throughout the experience. This occurs when the clinic includes the women in the decision-making process and demonstrates the ability to accommodate the women. Conversely, when the clinic disregards the women's concerns and fears, it hinders the potential for shared objectives and involvement. And for

some, even shared objectives and involvement is not enough to feel safe in a vaginal delivery. The theme thereby illustrates the importance of involvement and mutual accommodation for a positive experience.

Theme 2: Sense of safety, acknowledgement, and relations as the foundation for a positive experience in the doctor-midwife clinic

Most women emphasized the importance of emotional acknowledgement during consultations. When healthcare professionals demonstrated empathy and understanding, the women felt heard and seen, which provided them with a sense of safety. In addition, several women described how professional acknowledgement of a previous traumatic birth experience also had a positive effect on their experience:

It also matters a great deal to be acknowledged when one has experienced something distressing [...] that they can understand that we were shaken and that we need this conversation [...] to be met with this kind of understanding (interview 5)

For many women, the positive experiences with the healthcare professionals continued throughout pregnancy and was emphasized during delivery thus creating a coherent experience:

I feel that I have been cared for, seen, heard, and respected. Most importantly, I felt protected, as I had been very afraid of ending up in the same situation as during my First birth. Being listened to, and having someone explicitly say, 'X, I want to take care of you' was invaluable (interview 10)

Conversely, some women reported that a lack of emotional acknowledgement and insufficient time during the consultation contributed to a negative experience. Similarly, several women described that lack of continuity among healthcare professionals resulted in lack of professional consensus regarding the birth plan, which contributed to lack of trust in this and uncertainty regarding their upcoming birth:

I felt it was unfortunate that I had to meet so many different physicians after having that consultation. It was somewhat unsettling because they were not consistently in agreement [...] each time I was seen by a new specialist, there seemed to be suggestion that we could take a different approach (interview 5)

The experience of the clinic was also influenced by the dynamic between the obstetrician and midwife, which all women described as positive and well-defined roles. The majority (nine) characterized it as mutual respect and professional collaboration, allowing both parties to contribute with their respective perspectives, thereby creating a sense of safety:

The midwife focused more on the emotional aspects, while the physician concentrated on the physical aspects [...] I felt that the midwife's focus on the psychological aspects, alongside the physician's medical expertise, provided a beneficial dual approach that contributed to a sense of safety (interview 10)

Without exception, all women agreed that it was important for both an obstetrician and a midwife to be present during the consultation, and that this consultation could not be conducted solely by their own midwife.

Overall, this theme reflects that a positive experience in the clinic is dependent upon emotional and professional acknowledgement, as well as relations creating a sense of safety. Conversely, a lack of emotional acknowledgement, continuity and agreements among professionals, as well as insufficient time during consultations hinders the potential for a positive experience.

Theme 3: From the encounter with the doctor-midwife clinic to the fight for and success of a positive birth experience

Before attending the consultation at the doctor-midwife clinic, most women expected being offered a CS, often based on prior traumatic birth experiences. Several women were therefore unclear about the purpose of the clinic. When they were made aware of the new policy, the women expected to have to advocate for a CS, contributing to feelings of anxiety ahead of the consultation:

I went to the clinic and was extremely nervous, as I truly felt it was like entering a courtroom to argue my case. I felt I had to do everything to convince them, because for me, it was almost a matter of life or death to obtain this caesarean section. [...] It was therefore quite difficult, including the time leading up to the consultation (interview 10)

All women expected the birth plan to prevent previous traumatic birth experiences, to support a calm and safe pregnancy, and to be followed. For some, written documentation played a central role, as trust in the birth plan was established only because the healthcare professionals had documented it. Furthermore, for most women (six), trust in the birth plan and their willingness to pursue a vaginal delivery was only established because of the mutual agreement to convert to an emergency CS, if the birth plan was not adhered to:

And it made me feel secure to know that if things did not go well, we would convert (read: to a CS), which I felt comfortable with and reassured about (interview 5)

In contrast, some women reported limited trust in adherence to the birth plan, which contributed to feelings of unease. This was due to insufficient documentation or uncertainty whether other healthcare professionals would adhere to the birth plan:

I also checked my medical records afterward [...] and it had not been documented, which I found frustrating as it made me feel uncertain (interview 4)

Many women described that the birth plan created a sense of calm and predictability, which gave them the confidence to pursue a vaginal delivery. For the majority, the birth plan was actively offered and used during delivery, contributing to a highly positive birth experience. In

contrast, a smaller group had a less positive birth experience as the birth plan had limited impact, was not actively offered during delivery, or its relevance diminished immediately postpartum:

We had what I would probably call my 'dream birth.' I was allowed to have it the way I wanted. And I was given a sense of redemption, or a compensation, for the unfortunate experience I had the first time (interview 7)

I felt that it (read: birth plan) was somewhat a waste of time (interview 3)

Notably, the analysis revealed that, despite an initial preference for CS, many women were ultimately satisfied with achieving a vaginal delivery mostly due to a sense of empowerment:

It has truly been healing that it ultimately resulted in a vaginal birth (interview 5)

Overall, this theme reflects the importance of clear communication between the clinic and the women as well as documentation of and adherence to the birth plan as key factors for a positive birth experience. The birth plan served as a tool for establishing trust in a vaginal delivery. This is further outlined as even amongst women who initially requested a CS, many women were ultimately satisfied with achieving a vaginal delivery.

Advice and recommendations from the interviews to other women and the clinic have been conveyed to the clinic.

4. Discussion

The study aimed to evaluate different outcome measures of the doctor-midwife clinic at RHN by examining the characteristics of women referred to the clinic, by assessing if the clinic has reduced the elective CS-rate without compromising maternal and neonatal health, and by exploring the acceptability and satisfaction of the consultation, the birth plan, and the birth experience. In the following, all women giving birth at RHN will be referred to as the obstetrical reference group.

Characteristics of women referred to the doctor-midwife clinic

Number of referrals to the doctor-midwife clinic increased slightly from 4.34% in 2021 to 5.13% in 2024. This is in accordance with a noticeable increase in frequency of FOC and in willingness to talk about FOC [39, 40].

The study aimed to identify characteristics of women referred to the clinic to assess if these women represent the obstetrical reference group and if certain characteristics can be used to identify women that are at risk of FOC or who may benefit from a referral. In conclusion, women referred to the clinic represent the general population regarding sociodemographic characteristics, but not regarding characteristics of previous births. However, certain characteristics have been associated with FOC, and one should therefore expect differences in characteristics between the cohort and the obstetrical reference group.

Women referred to the clinic represent the obstetrical reference group except for fertility treatment, smoking, and multiparity which were overrepresented in the cohort [30]. Infertility and multiparity are risk factors for developing FOC and literature indicates that FOC is more prevalent among multiparous women [41, 42]. Smoking is associated with FOC in nulliparous women [43], which the authors expect to be applicable to multiparous women as well. Women referred to the clinic do not represent the general population regarding characteristics of previous births, as the cohort was overrepresented in prevalence of emergency CS, PPH, severe perineal tear, instrumental delivery, shoulder dystocia, and episiotomia [30]. These complications are associated with experiencing a traumatic birth [44, 45], which is in turn associated with FOC or increased likelihood for FOC in the subsequent pregnancy [14, 46-49]

These characteristics associated with FOC may help to identify women that are at risk of FOC and who benefit from a referral to the clinic.

Reasons for referral and common content of birth plans

To further characterize women referred to the clinic, the study aimed to identify common reasons for referral. This characterization of FOC will further aid in identifying women who may benefit from a referral. Furthermore, the aim was to identify common content of birth plans to determine what content should be prioritized by the clinicians to mitigate FOC. In conclusion, the authors identified three common reasons for referral characterizing FOC, however awareness of all 12 reasons is important to identify women who may benefit from a referral. The authors also found that choice of content does not depend on parity, highlighting the importance of offering the same content regardless of parity. Furthermore, the department

might consider consistently prioritizing or implementing some of the most common content in the birth plans as a general practice to help ensure a more positive birth experience.

A previous negative or traumatic birth experience is strongly associated with FOC [14, 46-49], found to be the primary reason for FOC in multiparous women [49], and is furthermore associated with maternal request CS to avoid a repetition of the trauma [14]. This is in accordance with “Previous traumatic birth experience” as the primary reason for referral to the clinic, evident in both journal reviews and all interviews. Furthermore, all women described this birth experience to form the foundation for specific content in the birth plan, intending to mitigate the risk of a similar experience (Theme 3).

During interviews, two women described prolonged labor to be a considerable part of their previous negative birth experience. “Fear of prolonged labor” was also the second most frequent reason for referral. The majority were multiparous, supported by studies associating previous labor duration with FOC in the subsequent pregnancy, and suggesting multiparous are more afraid of prolonged labor [49, 50]. This fear as a common reason for referral is also consistent with the prioritization of “Progression” and “Pp. med.” in the birth plans regardless of parity. This might be due to the clinicians’ experience of longer labor duration for nulliparous, hence the clinic may suggest including these contents in the birth plan for nulliparous to reduce the risk of a negative birth experience and FOC [51, 52].

“Previous insufficient communication” was the third most common reason for referral. The importance of communication was further highlighted in the interviews, where all women expressed how being involved (Theme 1) and both emotionally and professionally acknowledged was essential for a positive birth experience (Theme 2). Communication is essential for a positive birth experience regardless of parity [53-55], and insufficient communication is associated with a negative birth experience [56], which in turn is associated with FOC in the subsequent pregnancy [14, 46-49]. Furthermore, existing FOC is known to complicate communication during delivery [57]. This may explain why “Sufficient communication” and “Team time out” are highly prioritized in the birth plans regardless of parity.

Final delivery methods and maternal and neonatal outcomes

The study aimed to assess if the clinic has reduced the elective CS-rate without compromising maternal and neonatal outcomes. In conclusion, nulliparous women and especially women with previous CS have an increased risk of emergency CS, however this risk is significantly lower for multiparous women. As the maternal outcomes are affected, this questions whether the clinic can further reduce the elective CS-rate without compromising maternal health, and if they do, initiatives to mitigate these outcomes must be considered.

The study found that the clinic has not reduced the elective CS-rate between 2021 and 2024. However, since the clinic’s establishment in 2018, the elective CS-rate at RHN has decreased by 48.3% from 2017 to 2020 and additionally 8% from 2020 to 2024, resulting in elective CS accounting for 5.29% of all births at RHN in 2024, lower than the national CS-rate (9.59%) [30]. Therefore, one might argue that the maximum possible decrease in elective CS happened

before 2021 and the remaining 5.29% are non-reducible CS. However, in 2024 HSJ reduced the elective CS-rate to 3.07% without adverse effects on maternal and neonatal health [58], indicating that RHN can further reduce the elective CS-rate. As women referred to the clinic do not represent the obstetrical reference group regarding parity, smoking, fertility treatment, and characteristics of previous births, one might not expect the cohort's final deliveries to compare to the obstetrical reference group.

Between 2020-2024, fewer women in the cohort had a vaginal delivery, and more had an elective or emergency CS compared to the obstetrical reference group. One explanation for the high number of CS in the cohort compared to the obstetrical reference group is that smoking and fertility treatment are associated with an increased risk of CS [59-62][59-62] and women with FOC and women with a previous CS also have an increased risk of CS [18, 36, 60].

Another explanation for the high number of emergency CS in the cohort may be an expression of the mutual agreement between the clinic and women to convert to an emergency CS if the birth plan is not adhered to.

Maternal and neonatal outcomes were included to identify potential unforeseen adverse effects of the clinic.

Compared to the obstetrical reference group, a substantially larger proportion of women in the cohort experienced first- and second-degree tears [30], and only a smaller proportion experienced severe perineal tears, however still lower than in Region North Denmark [23]. In a qualitative study from Sweden, midwives experienced fear to cause perineal tears, which may therefore explain the increased prevalence of perineal tears in the cohort (Lindgren, 2011). Another explanation might be previous severe perineal tears which increases the risk of recurrence, applicable to 7.66% of the cohort [63]. In conclusion, women referred to the clinic are at greater risk for perineal tears, especially first- and second-degree, however significantly less for multiparous women.

Furthermore, the cohort more frequently experienced PPH following vaginal delivery and emergency CS in all categories except 0-499mL compared to the obstetrical reference group [30]. Literature suggests that women with previous PPH, applicable to 21.53% of the cohort, are at greater risk of recurrence of PPH, thus possibly explaining the increased prevalence in the cohort [64]. To the best of the authors' knowledge, there is limited research on the association between FOC and PPH.

Contradictory to maternal outcomes, neonatal outcomes measured as Apgar scores were not affected, as more neonates in the cohort following emergency CS had Apgar scores < 7 at 1 minute compared to the obstetrical reference group, but no differences at 5 minutes [30].

Acceptability and satisfaction with the doctor-midwife clinic

In evaluating the acceptability and satisfaction of the consultation, the birth plan, and the birth experience, CEQ and semi-structured interviews were used. The study compared CEQ-scores to evaluate whether the clinic and FOC affects women's birth experience using a study from 2022 conducted at RHN [27]. In conclusion, the overall CEQ-score is lower for the cohort compared to Lyngbye et al., however interviews suggest that the clinic contributed positively to their birth experience. Furthermore, higher CEQ-score is associated with multiparity and possibly labor duration > 12 hours.

As only 83 women completed the CEQ, the authors wished to assess if the CEQ-cohort sufficiently represented women referred to the clinic. Overall, the cohort represented women referred to the clinic regarding age, BMI, parity, and delivery method except for instrumental delivery. Characteristics between the cohort and Lyngbye et al. were found to be comparable except for differences regarding age, BMI ≥ 25 , PPH $\geq 500\text{mL}$, and educational level where the cohort had fewer less educated and more well educated [27].

Comparison of CEQ-scores revealed lower overall CEQ-score for the cohort [27], indicating that women referred to the clinic generally report a less positive birth experience. This calls into question whether the clinic and the birth plan were sufficient in supporting the women in their birth experience, or whether lower scores indicate the consequence of FOC on birth experience.

Women with FOC have an increased risk of dystocia and emergency CS [43], complications that often result in obstetrical interventions, which are associated with a lower CEQ-score [27]. This indicates that FOC contributed to the cohort's lower CEQ-scores. Furthermore, existing FOC is known to negatively affect communication [57], which may also contribute to a negative birth experience expressed as a lower CEQ-score for the cohort. Likewise, advanced age [41], increased BMI [65], and PPH $\geq 500\text{mL}$ [45], all more prevalent in the cohort, are associated with a negative birth experience or interventions during birth, thus resulting in an overall decreased CEQ-score. However, another study suggests these factors have no effect for nulliparous, as they argue birth care is equal for all [66].

Although the overall CEQ-score was lower for the cohort compared to Lyngbye et al., during interviews all women described that the consultation and the birth plan contributed positively to their birth experience, expressing this as their “best birth experience yet” or “a redemption of a previous negative birth experience”, and that they would recommend it to anyone (Theme 3). Taking this into consideration, the clinic must have contributed to a higher CEQ-score. The authors assume the lower CEQ-score must therefore be attributed to FOC and not because the clinic was unsuccessful in supporting the women. However, it is unrealistic to aim for equal or greater satisfaction of birth experience for women with FOC compared to women without, as FOC is associated with a negative birth experience [14, 40-43]. However, as women in the interviews suggested, the clinic can improve the overall experience, thus further improving the overall CEQ-score.

Conclusion

The study evaluated different outcome measures of the doctor-midwife clinic at RHN including elective CS-rate, maternal and neonatal health, and women's acceptability and satisfaction with the consultation, the birth plan, and the birth experience.

Common characteristics of women with FOC and reasons for FOC were identified. A reduction in elective CS-rate was found after the implementation of the clinic, but not between 2021 and 2024. Compared to the obstetrical reference group, neonatal health was unaffected; conversely, adverse effects on maternal health were evident.

CEQ-score was lower compared to the obstetrical reference group at RHN. However, interviews revealed that the consultation and the birth plan contributed positively to women's birth experiences, when involvement, mutual accommodation, emotional and professional acknowledgement, continuity, and clear communication were ensured. Furthermore, all women both an obstetrician and a midwife during the consultation.

Identified characteristics associated with FOC and characterization of FOC may aid in identifying women that are at risk of FOC and who may benefit from a referral to the clinic. These findings indicate that the clinic had a positive effect on women's acceptability and satisfaction with the consultation, the birth plan, and the birth experience, however as maternal outcomes are more affected compared to the obstetrical reference group, this questions whether the clinic can further reduce the elective CS-rate without compromising maternal health. This indicates the need for future research.

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Appendix A

Sociodemographic and reproductive health characteristics in the study cohort in comparison to the obstetric reference group	
Language	Definition: - Danish - Other (Rumanian, Columbian, English, Vietnamese, and Polish)
Intrapartum/neonatal morbidity	Definition: - Pathological CTG during labor - Paediatric consultation postpartum - Neonatal emergency - Paediatric admission immediately postpartum - Transfer to a highly specialized neonatal department at another hospital
Severe somatic complications related to pregnancy/birth	Definition: - Pelvic injury - Coccyx fracture - Excessive pain - Postpartum infection - Perineal tear requiring resuturing - Disabling excessive gestational weight gain
Characterization of FOC	
Reasons outlined in policies ^a	- Concerns regarding child/mother's life - Lack of pain relief - Lack of control - Fear of perineal tear - Avoid prolonged labor - PPH - Fear of emergency CS
Previous traumatic birth experience	Definition: When the obstetrician in the clinic referred to the previous birth as traumatic, including: - Emergency CS - Preeclampsia (PE) - Complicated delivery because of a large child - 2 nd trimester abortion - Indecent exposure - Postpartum infection - Unsuccessful vacuum extraction - Lack of adherence to the birth plan.
Exacerbation of somatic disease	Definition: Exacerbation of a preexisting somatic disease, including: - Incontinence - Voiding dysfunction

	<ul style="list-style-type: none"> - Recto- or cystocele - Pelvic myalgia - Pelvic asymmetry - Hip dysplasia - Hip- and backrelated pain or injury - Lichen sclerosus - Vaginismus - Urethral cyst - Perisylvian syndrome - Fear of recurring somatic disease from previous birth (incl. episiotomia or nerve infection, immobilisation due to birth-related pelvic injury)
Concerns regarding mental state/disorder	<p>Definition: exacerbation of a preexisting mental disorder, including:</p> <ul style="list-style-type: none"> - Generalized anxiety - Panic disorder - Specific (isolated) phobias - PTSD - PTSD-like symptoms - Postpartum depression - Perisylvian syndrome
Content of birth plans	
Progression	<p>Definition:</p> <ul style="list-style-type: none"> - Progression of labor according to national clinical dystocia guidelines. - Attention to timely labor progression.
Team time out	<p>Definition:</p> <ul style="list-style-type: none"> - The opportunity for the woman/partner to request a timeout with the obstetrician and midwife to discuss the labor progression.
Early admission	<p>Definition:</p> <ul style="list-style-type: none"> - The opportunity for admission during the latent stage of labor and until delivery.
Other pain relief	<p>Definition:</p> <ul style="list-style-type: none"> - Pharmacological pain relief: paracetamol, morfin, pudendal nerve block, local analgesia, sterile water injections, sedatives - Non-pharmacological pain relief: bathtub, warm shower, massage, acupuncture, Rebozo, transcutaneous electrical nerve stimulations, heating pads - Request that the midwife and obstetrician were focussed on providing sufficient pain relief and actively offered it during delivery.
Mobility	<p>Definition:</p>

	<ul style="list-style-type: none"> - Specific birthing positions - Movement during delivery
Postpartum haemorrhage (PPH) readiness	<p>Definition:</p> <ul style="list-style-type: none"> - The attention and medical preparation of the staff to a possible PPH
Gentle delivery	<p>Definition:</p> <ul style="list-style-type: none"> - Perineal protection techniques (Finnish manual perineal protection technique)
Avoid exposure	<p>Definition:</p> <ul style="list-style-type: none"> - As few vaginal examinations as possible - Clear consent before each vaginal examination - Attention to indecent exposure - Respect for “the private space”
Red card	<p>Definition:</p> <ul style="list-style-type: none"> - The opportunity for women to demand a CS during delivery
Maternal and neonatal outcomes	
Elective CS, non-medical indication	<p>Definition:</p> <ul style="list-style-type: none"> - Severe anxiety - Previous sexual assault - Previous traumatic birth experience - PTSD - Vaginismus - Perisylvian syndrome.
Elective CS, medical indication	<p>Definition:</p> <ul style="list-style-type: none"> - Placenta previa - Vasa previa - Breech presentation - Transverse lie - Unsuccessful partus provocatus medicamentalis (p.p.med.) - Polyhydramnios - Disproportionate size between mother and fetus - Sectio antea within 18 months.

^a <https://pri.rn.dk/document/RHNO-391924229-7953>