PLACE OF BIRTH – PREFERENCE, MOTIVATING FACTORS AND INFLUENCE OF EDUCATIONAL LEVEL

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Abstract

Background

The Dutch maternity care system is known for its clear distinction between primary and secondary care based on a risk selection procedure. Low-risk pregnant women start their pregnancy under supervision of a midwife. If complications occur during pregnancy or birth, women are referred to an obstetrician. Women with a low risk for complications remain under the supervision of a midwife and have the possibility to choose their place of birth, either at home, in the hospital or in a birth center in all cases under the supervision of a midwife. The aim of the research was to explore the preferences of pregnant women with regard to place of birth and factors that influence the decision making for choosing a place of birth.

Methods

A cross sectional study was performed. A questionnaire was developed using the stated preference method best-worst scaling to identify the preferences of pregnant women for place of birth and the factors that influence the preference. The study population consisted of low-risk pregnant women with free choice to decide where to give birth. Women were mainly recruited via physical therapy practices and information meetings for pregnant women.

Results

Between July and September 2015, 144 women participated in the study. 52 women (36.1 %) preferred a midwifery-led home birth, 67 women (46.5 %) preferred a midwifery-led hospital birth, 5 women (3.5 %) preferred a midwifery-led birth center birth, and 20 women (13.9 %) preferred an obstetric-led hospital birth. No significant relation was found for the characteristics: parity, age, weeks of gestation, educational level, ethnicity, partner, distance to hospital, and residency in Overijssel.

Conclusion

Women with a preference for a home birth found comfortable environment, trust in the natural birth process and privacy as most important. Women opting for a hospital birth – midwifery-led or obstetric-led – found safety, assistance during childbirth and pain relief most important. Least important motives to all respondents were family involvement and no co-payment. Minor differences were found between women with a middle and high educational level with regard to the level of importance.

Keywords

place of birth, preferences, motivating factors, best-worst scaling, primary and secondary care, midwifery-led, obstetric-led

Content

List of tables and figures

1. Introduction

Pregnant women in the Netherlands are in a unique position compared to women in most other Western countries. Dutch pregnant women with a low-risk pregnancy have the possibility to choose freely between giving birth at home, in a hospital maternity unit or in a birth center. In all cases the birth is attended by an independent practicing midwife or sometimes by a general practitioner. All these three cases are referred to as primary care.

When during pregnancy or childbirth complications occur as defined by the List of Obstetric Indication (LOI) (Verloskundig Vademecum, 2003) a woman is referred to secondary care, for which an obstetrician or clinical midwife is responsible. The LOI is a national, multi-professional guideline for risk indication and for determining the appropriate care provider for each individual (Van Haaken-ten Haken, Hendrix, Nieuwenhuijze, Budé, De Vries, & Nijhuis, 2012). In case of secondary care necessity, birth will take place in a hospital.
Table 1 provides an overview of the possible combinations between actual birth places and type of assistance during childbirth.

Table 1
Possible birth places and assistance

	Home	Birth center	Hospital
Primary care (low risk)	Midwife or GP	Midwife or GP	Midwife or GP
Secondary care (medium or high-risk)			Obstetrician or clinical midwife

The number of home births decreased since the mid-1960s. In 1964 68.5 percent of the women gave birth at home, in 2003 this percentage was 31.9. Nowadays only 15.9 percent of all pregnant women give birth at home (Perinatale Registratie Nederland, 2014). An explanation for the decline in the number of home births is the introduction of outpatient delivery in the 1970s which made it possible for low-risk pregnant women to choose between giving birth at home or in a hospital maternity unit. Another explanation for the decreased home birth rate is the increased number of referrals from primary to secondary care during pregnancy and birth in the last decade (de Vries, Nieuwenhuijze, & Buitendijk, 2013).

Of all births in 2013, 15.9 percent of the births were home births, 0.8 percent were births in a birth center, 11.7 percent were midwifery-led hospital births and no less than 71.4 percent of all births were obstetric-led hospital births (Perinatale Registratie Nederland, 2014). Although the number of women who give birth in midwifery-led care has declined steadily, the number of women who begin their pregnancy supervised by a midwife remains quite high (88 percent in 2011).

As long as women are empowered to choose their preferred place of birth, it is important for maternity care providers to explore and discover the wishes and feelings of women in their care so that realistic expectations can be promoted and fulfilled (Gibbens and Thomson, 2001). Although that there is an ongoing debate on the safety of home births, it is not proven that women who give birth at home are exposed to higher risks. In that respect the Dutch maternity care system is an example for other countries: birthing at home without medical interventions is not only possible, but also safe (de

Jonge, et al., 2009; de Vries, Nieuwenhuijze, & Buitendijk, 2013). De Jonge, et al. (2009) showed that a planned home birth is as safe as a planned hospital births. Three key elements contribute to the overall safety of home births in the Netherlands: (1) the availability of well-trained midwives, (2) a good transportation system for home birth transfers, and (3) a referral system that allows midwives to collaborate with obstetricians when referral is necessary (de Jonge, et al., 2009).

Next to various studies on the organization and safety of birth care, there has been an increased interest in the expectations and experiences of pregnant women with regard to their pregnancy and place of birth.

Research has shown that a positive birth experience has several important beneficial factors for women. The way women experience their birth has short-and long-term implications for their own health and well-being, as well as for their families (Nieuwenhuijze, De Jonge, Korstjens, Budé, & Lagro-Janssen, 2013). A positive experience contributes to women's sense of accomplishment, self-esteem, feelings of competence and well-being (Green, Coupland, & Kitzinger, 1990; Simkin, 1991; Mercer & Ferketich, 1994). A negative childbirth can severely influence a women's emotional well-being (Skari, et al., 2002; Boucher, Bennett, McFarling, & Freeze, 2009). In order to contribute to the positive birth experiences of women, it is important to know what motivates women when choosing a place of birth.

Numerous studies have explored the preferences and factors that are related to a women's choice for place of birth. Murray-Davis et al. (2012) identified motivating factors for women choosing a home birth. Control, privacy and family involvement were highlighted in their study. Control was not about dictating care, but about the involvement in decision-making. Kleiverda et al. (1990) found the same factors in their research, but also concluded that women who initially have doubts about the preferred location are more frequently influenced by their environment and significant others, such as the midwife and family members, in choosing a place of birth.

According to Kleiverda et al. (1990) women with a preference for a home birth were not scared by the possibility of being transferred to the hospital during childbirth. In contrast, women with a preference for a hospital birth prefer a hospital environment and place a relatively high value on not needing to be transferred to another location during childbirth if a problem arises (Longworth, Ratcliffe, & Boulton, 2001). In the same study Longworth et al. (2001) found as well that the access to pain relief medication was a reason for women to choose a hospital birth. In contrary to this, women choose home birth at least in part to avoid any medical interventions and medical technology (Wax, Lucas, Lamont, Pinette, Cartin, & Blackstone, 2010; Boucher, Bennett, McFarling, & Freeze, 2009). Women preferring home birth have trust in the natural process of giving birth (Murray-Davis, McDonald, Rietsma, Coubrough, & Hutton, 2014).

The study of Murray-Davis et al. (2014) showed factors influencing choice for place of birth. Feeling comfortable with the location was one of the key priorities to choose a specific place of birth. Another key factor identified in this research was perceived safety. To women with a preference for a hospital birth, the hospital felt safer and was seen as a safe choice for both mothers and babies. There is also the belief that giving birth in the hospital is cleaner than giving birth at home (Houghton, Bedwell, Forsey, Baker, & Lavendar, 2008). Women opting for a home birth felt safe in their home location whereby they had trust in the capabilities of their midwife (Murray-Davis, McDonald, Rietsma,

Coubrough, & Hutton, 2014). Van Haaren-ten Haken et al. (2014) mentioned monetary arguments for childbirth as a factor in the decision making for place of birth. Women with a low-risk pregnancy and a preference for a midwifery-led hospital birth are charged a co-payment for the additional cost of the hospital stay.

Various studies on the preference of place of birth and factors that influence the decision-making process note the importance of educational level (Kleiverda, Steen, Andersen, Treffers, & Everaerd, 1990; de Jonge, et al., 2009; Klein, et al., 2011). Women with a high educational level more often prefer a home birth than women with a middle or low education level (Kleiverda, Steen, Andersen, Treffers, & Everaerd, 1990). Women with a low educational level are often underrepresented in research. According to Klein et al. (2011) the choice of less well-educated women is most likely based on knowledge that is non-evidence-based. By focusing on the lower educated women it is possible to make a comparison between women with a low educational level and women with a middle or high educational level with regard to the preferred place of birth and the factors that influence this preference.

This research explores the preferences of pregnant women with regard to place of birth and factors that influence the decision making for choosing a place of birth. The birth options included in this research are the actual birth places where women give birth: home birth, midwifery-led hospital birth, midwifery-led birth center birth and obstetric-led hospital birth. Although an obstetric-led hospital birth is formally not an option for low-risk pregnant women to choose from, according to van Haaren-ten Haken et al. (2012) women are not being refused if they have a strong preference for giving birth under supervision of an obstetrician or clinical midwife. The exact number of women who prefer to give birth in secondary care is unknown as well as for the factors that influence the decision making of women preferring an obstetric-led hospital birth.

Therefore the central question of this research is as follows:
What are the preferences of pregnant women regarding the place of birth, what factors influence the preference for place of birth, and what is the influence of educational level on the preference for place of birth for women who give birth in the Netherlands?

2. Methods

2.1 Study population

A cross sectional study was performed to answer the research question (Babbie, 2004). A questionnaire was constructed to investigate the preference of pregnant women for place of birth and factors influencing choice for place of birth.

2.1.1 Recruitment

The target population of this research consisted of a convenience sample of low-risk pregnant women who live in the Netherlands. Women were recruited via information meetings of Zwanger in Twente, an organization who organizes meetings about pregnancy and childbirth for pregnant women in Twente. In addition, physical therapy clinics offering a pregnancy course were approached by email to help with the recruitment of respondents.

2.1.2 Inclusion and exclusion criteria

Women were included regardless of previous childbirths. The study population consisted of low-risk pregnant women with free choice to decide where to give birth.

Pregnant women with a medical indication according to the List of Obstetric Indication (LOI) (Verloskundig Vademecum, 2003) were excluded from the research. For example a medical history or problems occurred during (previous) pregnancy are stated in the LOI as reasons for midwives and obstetricians to decide that the birth has to take place in the hospital. According to the LOI, women expecting twins are also indicated to give birth in the hospital. Women with a medical indication have no free choice to decide where to give birth and were therefore excluded from this research.

2.1.3 Sample size

The stated preference method best worst scaling was applied. Best-worst scaling (BWS) is a survey method for eliciting individuals' relative importance of items in sets. Its purpose is, via repeated rounds of best-worst choices, to obtain a full ranking of items in a way that is easy for respondents (Flynn & Marley, 2014). This method does not allow for traditional statistical power calculation to determine the size of the statistical sample of the study population. The appropriate sample size depends on different factors, for instance: the question format, the complexity of the choice tasks, the desired precision of the results, the degree of heterogeneity in the target population, the availability of respondents, and the need to conduct subgroup analyses (Louviere, Hensher, & Swait, 2000). Because of the difficulty to determine the sample size, rules of thumb are created based on experience from earlier research using stated preference methods. Orme (2006) recommended sample sizes of at least 300 with a minimum of 200 respondents per group for subgroup analysis. However, a study on sample sizes used in conjoint analysis showed that in forty percent of all studies the sample size ranged from 100 to 300 respondents (Marshall, Bridges, & Hauber, 2010). For the purpose of this research the minimum required sample size was set at n = 100.

2.2 Instrument

The questionnaire was developed in-house at the University of Twente. The degree of difficulty of the questions in the questionnaire was taken into account with the intention that high, middle, and low educated women could participate in the study. The questionnaire consisted of three parts: socio-demographic and background characteristics (part A), preference for place of birth and assistance (part B), and factors that influence preference for place of birth (part C).

2.2.1 Socio-demographic and background characteristics

The first two questions in part A of the questionnaire were used to exclude women with a medical indication or women expecting twins. The following socio-demographic characteristics of respondents were identified: age, educational level, partner, ethnicity, distance to the hospital, and residency. The format used for educational level is based on the format applied by the Central Bureau of Statistics (CBS). The format of the CBS was also used for the classification of the population (CBS, 2014). The question on residency was added in order to determine if respondents were residents of Overijssel. Medical background characteristics include: weeks of gestation, parity, and if applicable previous place of birth.

The socio-demographic and background characteristics in the questionnaire were included to get a better impression of the research population and in order to make it possible to perform sub-group analysis for the preferred place of birth and educational level.

2.2.2 Preference for place of birth and assistance

Part B of the questionnaire consisted of only one question. Women were asked about their preference for place of birth and type of assistance during childbirth. There were four possible options which pregnant women could choose from:

1. At home, assisted by their own midwife or general practitioner
2. In the hospital, assisted by their own midwife or general practitioner
3. In the hospital, assisted by an obstetrician or by an clinical midwife
4. In a birth center, assisted by their own midwife or general practitioner

These four birth options are the actual birth places and type of assistance that are available during childbirth. Options 1, 2 and 4 include birth options in primary care (assisted by a midwife or GP). Option 3 includes birth in secondary care (assisted by an obstetrician or clinical midwife). Care in primary care is referred to as midwifery-led care; care in secondary care is referred to as obstetric-led care.

2.2.3 Factors influencing preference for place of birth

Part C of the questionnaire consisted of factors influencing the preference for place of birth. In the Introduction, several studies were mentioned that explored factors related to a women's choice for place of birth. Table 2 shows the 13 factors that were used in the questionnaire with a short description of the factor.

Table 2

Factors influencing preference for place of birth

Nr.	Factor	Description
1.	Safety	This place of birth is safer for me and my child
2.	Medical intervention	I want medical interventions as little as possible during labor
3.	Influence decision making	I want to have influence on the decision making during labor
4.	Comfortable environment	I would like to give birth in a comfortable environment
5.	Privacy	I would like to have privacy during childbirth
6.	Trust in natural birth	I have faith in the natural birthing process
7.	No co-payment	I do not want to pay for the place of birth
8.	Family involvement	I would like to involve my family during childbirth
9.	Guidance during childbirth	I would like to be optimally assisted during childbirth
10.	Transport	I want to minimize transport during childbirth
11.	Pain relief	I would like to have the ability to receive pain relief medication
12.	Hygiene	I think this is the most hygienic place to give birth
13.	Influence environment / significant others	This place of birth is recommended to me by my environment / significant others

The factors were presented to the respondents by using the best-worst scaling technique. BWS is categorized into three types: the object case (case 1), the profile case (case 2), and the multi-profile case (case 3). The cases differ from each other in the nature and complexity of the items chosen. In

case 1 BWS individuals are asked to choose the best and worst item from a set of objects. Case 2 BWS individuals evaluate profiles of objects described by combinations of attributes dictated by an underlying design. Profiles are shown one at a time and respondents select the best and worst attribute level within each presented profile. Within case 3 BWS individuals choose the best and worst profiles from various choice sets dictated by an underlying design (Louviere, Lings, Islam, Gudergan, & Flynn, 2013).

In this research case 1 BWS was used. Since there is no attribute and level structure to consider, case 1 designs are typically less complex and less problematic (Flynn & Marley, 2014). The aim of this research was to determine the influence of educational level on women's preferences for place of birth. Therefore it is important that the research method used is easy and clear to understand for all respondents, including women with a low level of education. Case 1 BWS is the easiest best-worst scaling technique and is considered less of a cognitive burden on respondents as case 2 and 3 BWS. For case 1 BWS, respondents only have to choose the most important and least important object among a set of objects.

Respondents were provided with 13 scenarios that contain 4 factors each and were asked to select the factor they considered to be the most important (best) and the least important (worst) within each scenario. The scenarios were constructed using a balanced incomplete block design ensuring each factor appeared with equal occurrence and co-occurrence of all other factors (Ejaz, Spolverato, Bridges, Amini, Kim, & Pawlik, 2014). The balanced incomplete block design that was used to design the scenarios is presented in Table 3. The numbers in the rows correspond with the number of the scenario. The numbers in the columns correspond with the factor numbers in Table 2. Appendix I shows an example of one of the thirteen scenarios used in the questionnaire.

Table 3

Balanced incomplete block design with 13 factors, 13 scenarios, and block size 4

Block	1st item	2nd item	3rd item	4th item
1	1	2	3	10
2	1	4	7	11
3	1	6	8	12
4	1	5	9	13
5	4	5	6	10
6	2	5	8	11
7	2	4	9	12
8	2	6	7	13
9	7	8	9	10
10	3	6	9	11
11	3	5	7	12
12	3	4	8	13
13	10	11	12	13

2.3 Data collection

Data was collected using a questionnaire. Between July and September 2015 the questionnaire was available both online as well as on paper. The questionnaire was distributed via e-mail to pregnant women following a pregnancy course at physical therapy clinics. Women attending an information

meeting of Zwanger in Twente were handed out the questionnaire on paper, together with a postage paid envelope to return the questionnaire at their own convenience. These women also received a flyer with an instruction on how to fill out the questionnaire online. A message on Facebook was posted to enlarge the number of respondents by asking friends to share the message with their friends. Finally, a message was posted on various pregnancy forums to reach more pregnant women.

2.4 Data analysis

Data from the questionnaire were entered and stored automatically in LimeSurvey. Questionnaires filled out on paper were entered by hand. Data were analyzed using software package IBM SPSS Statistics 22.0 and Microsoft Excel 2010.

2.4.1 Descriptive statistics

For the variables in part A of the questionnaire descriptive statistical analysis was performed. Frequency distributions, means and standard deviations were used to give a clear representation of the study population. For the chosen preferred place of birth frequencies and percentages were given. The Fisher exact test was used to determine whether or not a significant relationship exists between preferred place of birth and the different characteristics used. The Fisher exact test gives a better result over the chi-square test due to the low count in a number of cells.

2.4.2 Best and worst scores

A counts analysis on the best and worst questions was performed. First, the level of importance per factor for all respondents was calculated. The level of importance was determined by subtracting the number of times a factor was chosen as least important (worst) from the number of times that same factor was chosen as most important (best) in all choice sets. The level of importance for each factor depends on the number of respondents (n=144) and the frequency that each factor appears in the choice sets (4). To allow the best-minus-worst (B-W) scores for comparison between different groups of respondents, the B-W scores were transformed to standard scores. The standard score could range from +1 to -1. A positive standard score for a factor represents a factor that was more often selected as “most important” than selected as “least important” by respondents and was likely to be more preferred than factors with a negative standard score.

In order to determine if best choices are inversely related to worst choices, a scatterplot was drawn. The best choice frequency is plotted against the worst choice frequency of each factor. In case of an inverse relationship attractive factors should be chosen frequently as best and infrequently as worst. An unattractive factor should be chosen frequently as worst and infrequently as best (Louviere, Flynn, & Marley, 2015).

To show which factors are important for women choosing a place of birth, the level of importance per factor by place of birth was calculated. Eventually, to determine the influence of educational level on women’s decision making for place of birth the level of importance by educational level was presented.

3. Results

219 women started the questionnaire either online or on paper. Of the 219 respondents, 28 respondents did not meet the inclusion criteria to participate in the research. These women had a medical indication according to the List of Obstetric Indication to deliver in the hospital (n=27) or were expecting twins (n=1).
Of the remaining 191 participants, 45 women failed to complete the questionnaire and were therefore excluded. Finally, two women who filled out zero weeks of gestation were excluded. The study population of this research therefore exists of 144 pregnant women.

Of the 144 women who participated in the study, 52 women (36.1 %) preferred a midwifery-led home birth, 67 women (46.5 %) preferred a midwifery-led hospital birth, 5 women (3.5 %) preferred a midwifery-led birth center birth, and 20 women (13.9 %) preferred an obstetric-led hospital birth.

3.1 Characteristics of study population

The characteristics of the study population are presented in Table 4. The majority of the respondents were nulliparous women (n = 103, 71.5 %) and mean age was 28.9 years (SD = 2.8; n = 144). Mean weeks of gestation was 26.6 weeks (SD = 9.6). Respondents predominantly had a high educational level and the majority were Dutch women (n = 141, 97.9 %). All participants had a partner, and 112 of the 144 women (77.8 %) were residents of Overijssel (Table 4).

The differences between the characteristics and the preferred birth places are also presented in Table 4. Only two women in the study population (1.4 %) had a low educational level, 41 women had a middle educational level (28.5 %) and 101 women had a high educational level (70.1 %). However, no significant relation was found in the data between place of birth and educational level ($\chi 2(6)= 8.686$, $p= 0.155$).

For the other characteristics mentioned in Table 4, no significant differences between place of birth were found with regard to parity ($\chi 2(3)= 3.353$; $p= 0.316$); age ($F= 1.622$; $p= 0.187$); weeks of gestation ($F= 0.926$; $p= 0.430$); distance to hospital ($\chi 2(15)= 12.739$; $p=0.577$); and residency in Overijssel ($\chi 2(3)= 6.463$; $p=0.082$). The number of women with a non-Dutch background was too small to say anything about the differences between preferred place of birth and ethnicity. This also applied to preferred place of birth and partner. All women in the study population had a partner.

3.2 Importance of factors that influence preference for place of birth

Table 5 shows the total best minus worst (B-W) scores of all respondents. The factors considered as most important were *assistance during birth*, *comfortable environment* and *safety*. In contrary, *no co-payment*, *family involvement*, and *influence environment/significant others* were considered to be the least important factors for pregnant women to choose a place of birth.

According to the best and worst scores, it could be seen that all factors were chosen at least once as best or as worst across the questionnaire. Six out of thirteen factors were more frequently chosen as 'most important' than as 'least important' by the respondents.

Table 4

Characteristics of research population by preferred place of birth

	Total	Primary care (midwifery-led)			Secondary care (obstetric-led)
Characteristic	n = 144 (%)	Home n = 52 (%)	Hospital n = 67 (%)	Birth center n = 5 (%)	Hospital n = 20 (%)
Parity					
Nulliparae	103 (71.5)	36 (69.2)	50 (74.6)	5 (100)	12 (60.0)
Multiparae	41 (28.5)	16 (30.8)	17 (25.4)	0 (0)	8 (40.0)
Age (mean, SD)	28.9 ± 2.8	28.9 ± 3.0	28.6 ± 2.4	30.6 ± 2.7	29.9 ± 3.1
Weeks of gestation (mean, SD)	26.6 ± 9.6	25.7 ± 9.3	28.0 ± 9.0	24.4 ± 17.0	24 ± 15.3
Educational level [a]					
Low	2 (1.4)	1 (1.9)	0 (0)	0 (0)	1 (5.0)
Middle	41 (28.5)	17 (32.7)	16 (23.9)	0 (0)	8 (40.0)
High	101 (70.1)	34 (65.4)	51 (76.1)	5 (100)	11 (55.0)
Ethnicity					
Dutch	141 (97.9)	52 (100)	67 (100)	4 (80.0)	18 (90.0)
non-Dutch	3 (2.1)	0 (0)	0 (0)	1 (20.0)	2 (10.0)
Partner					
Yes	144 (100)	52 (100)	67 (100)	5 (100)	20 (100)
No	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Distance to hospital (km)					
0 – 5	51 (35.4)	13 (25.0)	29 (43.3)	2 (40.0)	7 (35.0)
6 – 10	29 (20.1)	13 (25.0)	10 (14.9)	2 (40.0)	4 (20.0)
11 – 15	20 (13.9)	8 (15.4)	8 (11.9)	0 (0)	4 (20.0)
16 – 20	33 (22.9)	15 (28.8)	14 (20.9)	1 (20.0)	3 (15.0)
> 20	7 (4.9)	2 (3.8)	5 (7.5)	0 (0)	0 (0)
Unknown	4 (2.8)	1 (1.9)	1 (1.5)	0 (0)	2 (10.0)
Residency in Overijssel					
Yes	112 (77.8)	38 (73.1)	58 (86.6)	3 (60.0)	13 (65.0)
No	32 (22.2)	14 (26.9)	9 (13.4)	2 (40.0)	7 (35.0)

a Educational level is classified into: low (primary school, MAVO, LBO, MBO-1), middle (HAVO, MBO-2,3,4) and high (HBO, WO)((CBS, 2014).

Table 5

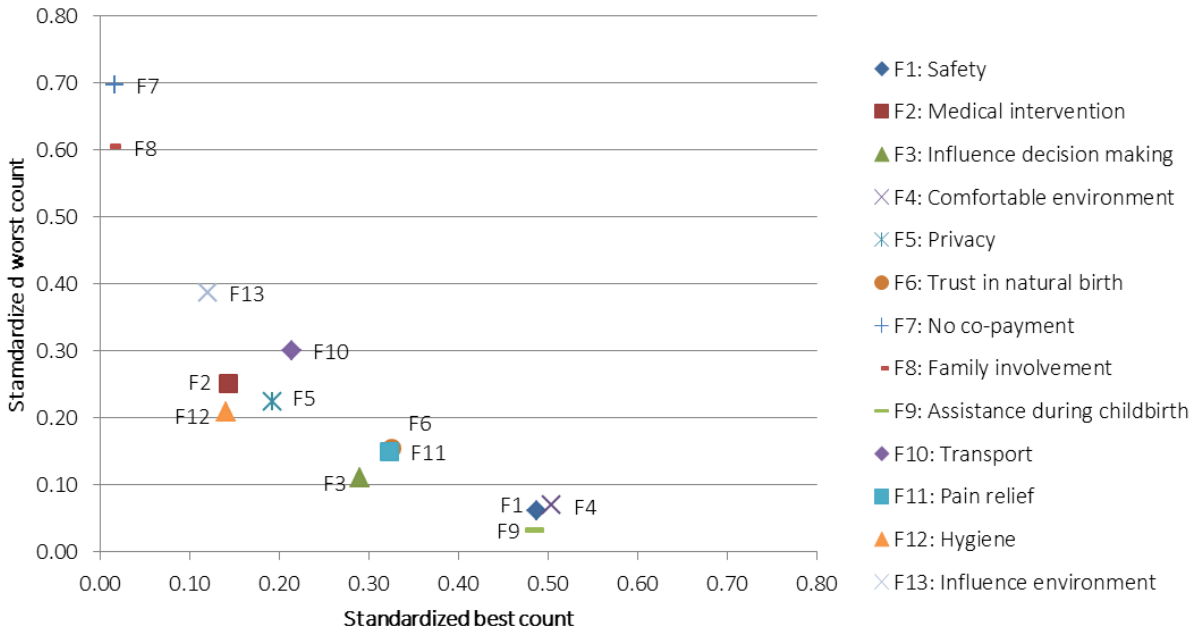
Total best-worst scores study population

Factor	Total best	Total worst	B-W score	B-W Standard score
Assistance during birth	279	19	260	0.45
Comfortable environment	290	40	250	0.43
Safety	281	35	246	0.43
Influence decision making	167	64	103	0.18
Pain relief	186	86	100	0.17
Trust in natural birth	187	89	98	0.17
Privacy	111	129	-18	-0.03
Hygiene	81	120	-39	-0.07
Transport	123	173	-50	-0.09
Medical intervention	82	145	-63	-0.11
Influence environment / significant others	69	223	-154	-0.27
Family involvement	7	348	-341	-0.59
No co-payment	9	401	-392	-0.68

The scatterplot in Figure 1 shows the distribution of the standardized best and worst counts of the factors chosen by the respondents as presented in Table 5. The plot indicates an inverse relationship for the factors that are most important and least important for respondents. *Comfortable environment*, *safety* and *assistance during childbirth* have high best counts and minimal worst counts. *No co-payment* and *family involvement* have high worst counts and minimal best counts.

There is a relatively large group of factors in the middle of the plot for which the standardized best and worst scores are almost evenly divided. For instance, indifferences were seen for the factors transport and hygiene. The total best and worst counts in Table 5 show that *transport* is relatively often chosen as best and as worst, implicating that respondents disagreed upon the importance of the factor transport. In contrast, *hygiene* was not frequently chosen by respondents in the study population.

Figure 1
Distribution of standardized best and worst counts

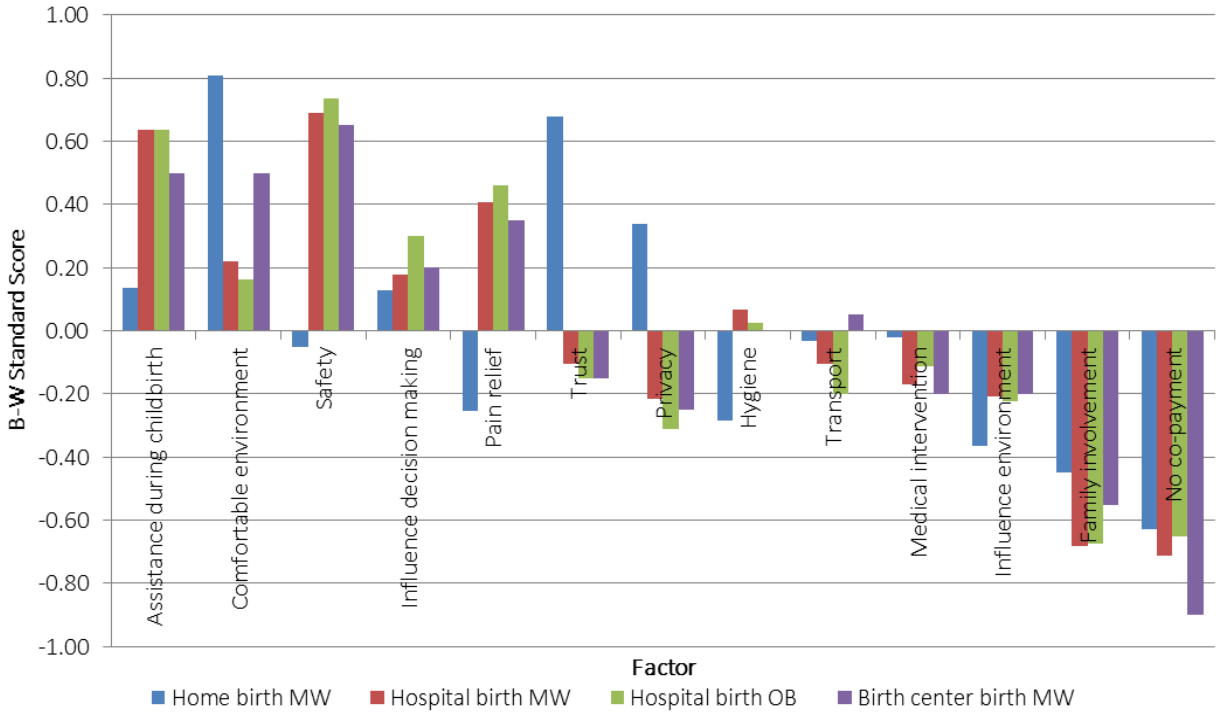


3.2.1 Level of importance per factor by place of birth

Figure 2 presents the level of importance per factor by place of birth by using B-W standard scores. Respondents with a preference for a home birth indicated that the perceived *comfort of the environment* (0.81), *trust in a natural birth* (0.68) and *privacy* (0.34) as most important factors. For the midwifery-led hospital birth and the obstetric-led hospital birth group *perceived safety* (0.69; 0.74), *assistance during childbirth* (0.64; 0.64) and *pain relief* (0.41; 0.46) were the most important. *Perceived safety* (0.65), *assistance during childbirth* (0.5) and the *comfortable environment* (0.5) were considered as most important by respondents with a preference for a birth center birth. Remarkably the least important factors are for all four preferred birth places the same: *family involvement* and *no co-payment.*

Figure 2

Level of importance per factor by place of birth



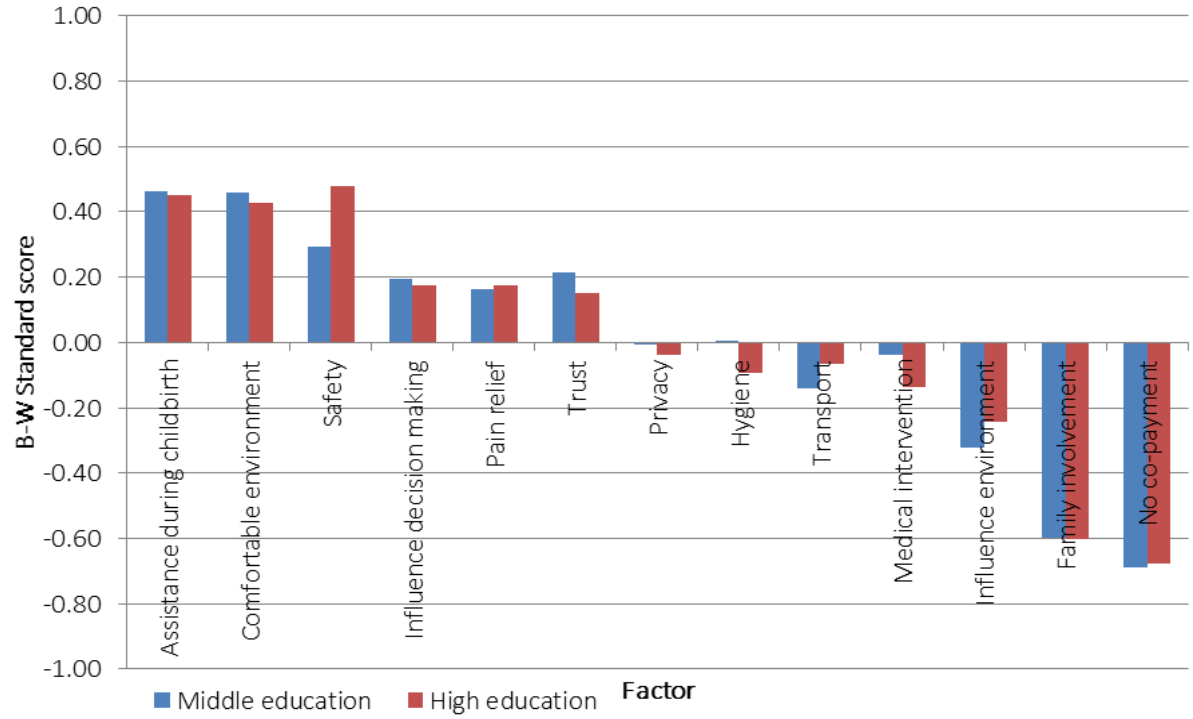
3.2.2 Level of importance by educational level

Only minor differences were found in the level of importance for educational level (Figure 3). Both respondents with a middle and high educational level found *perceived safety*, *assistance during childbirth,* and *safety* as most important factors to choose a certain place of birth. However, the extent to which the factor *safety* was important differed between the middle and high educated women (0.29 vs 0.48). Also remarkable is the difference in level of importance for the factor *hygiene*. Whereas the score of middle educated women is slightly positive, higher educated women show a negative score (0.01 vs -0.09).

Due to the small sample size the level of importance by educational level is only shown for women with a middle educational level (n=41) and women with a high educational level (n=101).

Figure 3

Level of importance per factor by educational level

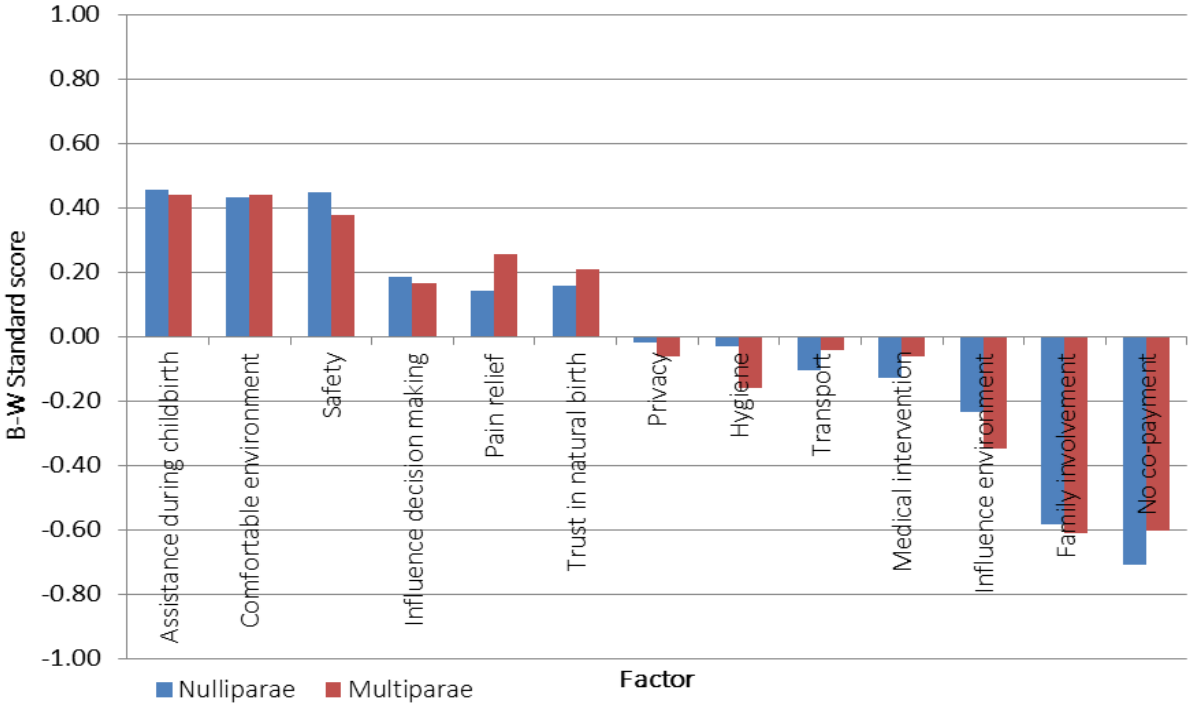


3.2.3 Level of importance by parity

Multiparous women considered the factors *pain relief* and *trust in the natural birth process* as more important than nulliparous women (0.26 vs 0.14; 0.21 vs 0.16). *Hygiene* and the *influence of the environment* were found less important to multiparous women in comparison to nulliparous women (-0.16 vs -0.03; -0.35 vs -0.24).

Figure 4

Level of importance per factor by parity



4. Discussion

4.1 Findings and comparison with literature

The aim of this study was to examine the preferences of low-risk pregnant women with regard to their preference for place of birth, what factors influenced the preference for place of birth, and what influence educational level has on the choice for place of birth. Although formally low-risk pregnant women do not have the possibility to choose to give birth in secondary care, this study examined the preferences for all four actual birth options in the Netherlands, in both primary and secondary care.

Approximately 36 percent of the questioned women preferred a home birth, 46 percent preferred a midwifery-led hospital birth, while almost 14 percent of the women preferred an obstetric-led hospital birth. The remaining 4 percent of the women preferred a birth center birth. The preference for place of birth of the women in the study population is in line with national statistics. Data from the National Perinatal Registry in the Netherlands show that in 2007 42 percent of the pregnant women intended to give birth at home, 42 percent intended to have a midwifery-led care hospital or birth center birth and 16 percent of the women intended to give birth in secondary care (Stuurgroep Zwangerschap en Geboorte, 2009).

No significant relation was found between place of birth and educational level. Women with a low educational level were underrepresented in the sample.

Van Haaren-ten Haken et al. (2012; 2015) found no effect for level of education, which is in line with this research. However, Kleiverda et al. (1990) mentioned that education level was the main predictor for place of birth. Women with a high educational level more often preferred a home birth than women with a middle or low educational level. Earlier research showed that multiparous women under the care of a midwife were more likely to give birth at home than nulliparous women (Anthony, Buitendijk, Offerhaus, Van Dommelen, & Van der Pal-de Bruin, 2005). This does not apply for the women in this study sample. Multiparous women choose as often for a home birth than a midwifery-led hospital birth.

When looking at the level of importance of the thirteen factors used in the questionnaire the factors *assistance during childbirth*, *comfortable environment*, and *safety* were found most important by respondents for choosing a place of birth. Similar statements were made by Grigg et al. (2015) as well.

In contrary, *influence of the environment or by significant others*, *family involvement*, and *no co-payment* were the least important factors to women to choose a place of birth. Various studies actually showed the importance and effect of influence by the environment such as midwifery practices (Wiegers, Van der Zee, Kerssens, & Keirse, 2000) or by significant others (Coxon, Sandall, & Fulop, 2014; Grigg, Tracy, Schmied, Daellenbach, & Kensington, 2015).

According to the level of importance per factor by place of birth, for the home birth group *comfort of the environment*, *trust in a natural birth* and *privacy* were the most important factors in their choice for place of birth. *Family involvement* and *no co-payment* were mentioned as least important within all groups.

Safety, *assistance during childbirth* and *pain relief* were the most important factors for women preferring a midwifery-led hospital birth as well as women preferring an obstetric-led hospital birth. Women with a preference for a home birth perceive *pain relief* not as an important factor in their choice for birth place. Pavlova et al. (2009) concluded on the other hand that if the attractiveness of home births in the Netherlands should be preserved, then specific attention should be paid on the approach to pain during home birth. The women choosing a birth center birth fully comply with the factors that are shown for the overall group (*assistance during birth*, *comfortable environment*, *safety*), though this group only consisted of five women.

The level of importance by educational level was only analyzed for the middle and high educated women of the research population. The main difference was found for the factor *safety*. The level of importance was higher for women with a high educational level. This is in line with the study of Kleiverda et al. (1990). Multiparous women considered *pain relief* and *trust in the natural birth process* as more important than nulliparous women. *Hygiene* and the *influence of the environment* were found less important to multiparous women in comparison to nulliparous women. Previous birth experience can explain these differences in the level of importance.

4.2 Strengths and limitations

Previous research performed in the Netherlands already studied the preferences of pregnant women with regard to place of birth. However these studies did not use best-worst scaling to examine the actual importance of factors that influenced the preference for place of birth. Earlier studies used discrete choice experiments (DCE) (Pavlova, Hendrix, Nouwens, Nijhuis, & Van Merode, 2009) and ranking scales (Van Haaken-ten Haken, Hendrix, Nieuwenhuijze, Budé, De Vries, & Nijhuis, 2012) to explore preferences and motives regarding place of birth. As stated by Flynn (2010) BWS is a good compromise between the two methods: more information is obtained with BWS than DCE, and respondents are not potentially burdened by requesting them to provide a full ranking of all choice options. DCE and rating scales have some limitations, such as social desirable responding, acquiescence and scalar inequivalence (Adamsen, Rundle-Thiele, & Whitty, 2013), which are minimized when using BWS.

Using BWS has also some limitations, one of which is the large sample that is required. Orme (2006) recommended sample sizes of at least 300 with a minimum of 200 respondents per group for subgroup analysis. The sample size of n=144 exceeds the agreed quantity of n=100. Though there are some concerns with the external validity of the findings. The majority of the respondents were high or middle educated pregnant women. The number of low educated women was very limited. The generalizability of the findings is questionable due to the way in which respondents were obtained. The lack of low educated women in the sample is possibly caused by the way data was collected.

The intention was to recruit pregnant women at midwifery practices, but due to a high workload at midwifery practices and the number of studies that were already conducted recruitment was performed elsewhere. Respondents were mostly recruited at physical therapy practices, where women attended a prenatal course. It is possible that low educated women are missed in the study sample, because prenatal courses are not free of charge. Women have to pay for the prenatal lessons. It is possible that low educated women have a low socio economic status as well. As prenatal courses are no obligation for women to attend, there is a possibility that women with a low educational level

and low income only visit their midwife and not attend an additional course during pregnancy. Women were also recruited via Facebook and forums, which have the effect that only people that are active on these websites will potentially participate in the study.

Another limitation of this study concerns the data collection instrument used in this research. Although the questionnaire was reviewed several times on content and to use easily understandable questions, women who filled out the questionnaires on paper clearly had some difficulties with answering the BWS questions. However, after giving an additional explanation how to fill out these questions women managed very well to answer the BWS part of the questionnaire. A potential improvement for future research can be the randomization of the BWS scenarios. This will help to limit the feeling of filling out repetitive questions.

Also some concerns were expressed with regards to one of the questions in the questionnaire during the data collection period. These concerns were related to the question on preference for place of birth (Part B). The question implicated that women had the possibility to choose for a birth in secondary care. Although in real-life this is currently not the case.

4.3 Recommendations

The BWS method used was appropriate for this type of research. It is a proper method to relatively quick observe what pregnant women find most important and least important, in contrast to other rating and ranking scales. BWS gives a clear view of the actual situation, without using hypothetical profiles. Further research is required to understand the impact of smaller sample sizes and the generalizability of findings. In many cases the recommended size of a research group of n=300 or an n=200 for a subgroup is time consuming or not even always possible to meet.

It turned out that lower educated people are difficult to reach for research purposes. It is important to understand why these difficulties arise. Is there only a lack of interest, or are there more issues why lower educated people do not participate in scientific research.

Furthermore, the overall educational level (of women) might have changed, making the group of lower educated people smaller. CBS (2014) statistics show a decrease in the number of lower educated women from 20.6 percent in 2003 to 12.2 percent in 2015. This change might require further research to understand the impact on current and new study populations. As the group of lower educated people is getting smaller, it is more important to actually reach these people in a proper manner.

Solutions that require further analysis are the involvement of midwifery practices for this specific subgroup. Next to that it would be interesting to understand if the use of incentives can contribute to reach a higher number of (lower) educated persons. Whereby it should be taken in consideration that incentives might impact the way people answer questions.

4.4. Conclusion

This study shows the preferences of pregnant women with regard to place of birth. For place of birth the actual birth options in the Netherlands were included, both in primary and secondary care. Factors that influenced the decision making for place of birth were scored by using best-worst scaling. Women

with a preference for a home birth found comfortable environment, trust in the natural birth process and privacy as most important. Women opting for a hospital birth – midwifery-led or obstetric-led – found safety, assistance during childbirth and pain relief most important. Least important motives to all respondents were family involvement and no co-payment.

No significant relation was found between preference for place of birth and educational level. Only minor differences were found between middle and high educated women with regard to the level of importance. Women with a high educational level found the factor safety more important than women with a middle educational level.

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