

The childbearing period is a period from one time that never returns to another and incorporates a profound and powerful human experience. For most mothers-to-be, pregnancy and childbirth are happy and enjoyable events described with feelings of empowerment, elation and achievement. Thus, this period in life includes a certain vulnerability for the woman and her child which might be associated with heightened levels of anxiety and emotion, pain and loss of control. Healthy children should be born by healthy and well-prepared parents with the least possible intervention. The nature and priority status of maternal and child health has changed over time. For many centuries, the care of mothers was regarded as a domestic affair belonging to the realm of mothers and midwives, but was transformed into a public health priority during the 20th century. Public health services offer routine exams to both low and high risk pregnant women. Whereas mothers were previously thought of as targets for well-intentioned programs, they are now increasingly claiming the right to access quality care as an entitlement guaranteed by the state. In doing so, they have transformed maternal health from a technical concern to a moral and political imperative.

Within the field of birth science, knowledge about almost every aspect can be acquired with the help of various techniques. The boundary between the principle of beneficence and dangerous possibilities has been exposed. A major part of risk assessment involves understanding and seeing over time that something is not right. Prenatal care is under scrutiny; we see a battle between professions, a battle over the allocation of funds within the health care system, a battle against medicalization, and a campaign against focusing on risks. General and professional perspectives on risk differ from one another. Respective groups of politicians, professionals and lay people have differing views about what constitutes acceptable risk, and this is also true within each of these groups.

Perspective of risk in childbirth, women's expressed wishes for mode of delivery and how they actually give birth.

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Abstract

Aims: The main aim of this thesis was to study a perspective of women`s expressed wishes for mode of delivery and how they actually give birth. Additional aims were to examine the notion of risk applied to childbirth, to examine what characterizes women who want to give birth as naturally as possible without painkillers or intervention and the characteristics of women who would, if possible, choose to have a cesarean section.

Material and methods: The notion of risk was examined in an essay. Self-rating instruments were completed by 55,858 MoBa participants during week 30 of their pregnancy and available from The Norwegian Mother and Child Cohort Study (MoBa) by April, 2007. Individually reported information on socioeconomic factors, lifestyle factors, feelings related to childbirth, factors concerning psychosocial health, physical, psychological and sexual harassment and information on satisfaction with antenatal care health services were collected from a MoBa questionnaire. Data on the mother`s age, parity, physical health before and during the pregnancy, previous cesarean sections and actual mode of delivery were collected through a linkage to the The Medical Birth Registry of Norway.

Findings: General perspectives on risk differ depending on both the person and the profession. More and more childbearing women are in danger of being considered deficient and in the danger zone. Figures on risk are not objective values, and the association between risk and security is socially and culturally determined. Personal symbols can be basic assumptions about the life one leads, and the childbearing woman has preferences of her own. Interest in natural childbirth was expressed by 72 percent and a wish for caesarean section was expressed by ten percent of the women. Positive experience from previous childbirths, first birth or third or later birth, no dread of giving birth, and reporting positive intra-psyche phenomena are significantly associated with the wish for natural birth. Negative experiences from previous childbirths and fear of giving birth are two of the strongest factors associated with a wish for a caesarean section. Overall, 47 percent of the women who wanted "as natural a birth as possible" had their preference fulfilled. The figures differed largely for primiparas and multiparas; the risk of acute caesarean sections was high among primiparas and the effects of the predictors of natural birth were stronger for primiparas than for multiparas.

Conclusions: The factors that influence the chance of having a natural birth are different for primiparas and multiparas. The high rate of non-natural births among first time mothers who actually want to have a vaginal birth without interventions should call attention to the increasing incidence of cesarean section in Norway. The chance of actually having a natural birth for women with a preference for a natural birth is much larger for multiparas. Negative experiences from previous childbirths and cesarean section are, however, important factors associated with non-natural birth and should be taken into consideration in public health.

Keywords: natural birth, cesarean section, self-determination, birth experiences, birth trends, age, parity, educational level.

Sammendrag

Mål: Det overordna målet for denne avhandlingen var å studere perspektiv omkring hvordan kvinner uttrykker at de ønsker å føde og hvordan de faktisk føder. I tillegg var målet å undersøke risikobegrepet anvendt innen fødselsomsorg, undersøke hva som karakteriserer kvinner som ønsker å føde så naturlig som mulig uten smertestillende eller intervensjon og undersøke hva som karakteriserer kvinner som ville valgt å ta keisersnitt dersom det var mulig.

Materiell og metode: Avhandlingen inkludere fire artikler. Risikobegrepet drøftes i første artikkel som er et essay. De 3 andre inkluderer data fra Den norske mor og barn-undersøkelsen. Data fra 55,858 MoBa informanter var ferdigregistrert april 2007 og omfatter individuell informasjon om sosioøkonomiske faktorer, livsstilsfaktorer, følelser/opplevelser relatert til fødsel, faktorer som omhandler psykososial helse, fysiske, psykiske og seksuelle overgrep og informasjon om tilfredshet med offentlig svangerskapsomsorg. Tidligere keisersnitt og hvordan kvinnene faktisk fødte i dette svangerskapet ble hentet fra en link til Medisinsk Fødselsregister.

Funn: Generelt perspektiv på risiko er forskjellig, avhengig av både person og profesjon. Stadig flere gravid/fødekvinne står i fare for å bli betraktet som utsatte/mangelfulle og i faresonen. Kalkulasjoner av risiko er ikke objektive verdier og assosiasjonen mellom risiko og sikkerhet er sosialt og kulturelt bestemt. Subjektive symbol kan være grunnleggende antagelser/forståelser i forhold til det livet en lever og blivende mødre har sine egne preferanser. Syttito prosent av kvinnene uttrykte ønske om å føde så naturlig som mulig og ti prosent av kvinnene ønsket å ta keisersnitt. Positive erfaringer fra tidligere fødsler, det å være førstegangsfødende eller ha født mer enn ett barn tidligere, ikke være redd for å føde, samt å rapportere positivt i forhold til intrapsyriske fenomen, er signifikant assosiert med ønske om å føde så naturlig som mulig. Negative erfaringer fra tidligere fødsler og redsel for å føde er de to faktorene som er sterkest assosiert med ønske om keisersnitt. Samlet sett fikk 47 prosent av de kvinnene som ønsket så naturlig fødsel som mulig, oppfylt ønskene sine. Resultatet var svært ulikt mellom førstegangsfødende og fleregangsfødende; risikoen for akutt keisersnitt var høy blant førstegangsfødende og effekten av prediktorene for naturlig fødsel var sterkere i forhold til førstegangsfødende enn for fleregangsfødende.

Konklusjon: Faktorene som influerer sjansen til å føde så naturlig som mulig er ulike for førstegangsfødende og for fleregangsfødende. Den høge tallet på fødsler med intervensjon hos førstegangsfødende som egentlig ønsker å føde vaginalt uten intervensjon burde fått større oppmerksomhet. Dette bør også sees i sammenheng med en stadig økende innsidens for keisersnitt i Norge. Muligheten for å få en så naturlig fødsel som mulig er mye større for fleregangsfødende. Negative erfaringer fra tidligere fødsler og tidligere keisersnitt er, likevel, viktige faktorer assosiert med ikke-naturlig fødsel og bør reflekteres over/tas i betraktning i et folkehelseperspektiv.

Nøkkelord: naturlig fødsel, keisersnitt, selvbestemmelse, fødselserfaring, fødselstrenger alder, paritet, utdanningsnivå.

List of papers

This thesis is based on the following studies, which will be referred to in the text by their Roman numerals:

- I Kringeland T, Möller A. Risk and security in childbirth. *Psychosom Obstet Gynaecol.* 2006; 27; 4:185–191.
- II Kringeland T, Daltveit AK, Möller A. What characterizes women who want to give birth as naturally as possible without painkillers or intervention? *Sexual & Reproductive Healthcare.* In press.
- III Kringeland T, Daltveit AK, Möller A. What characterizes women in Norway who wish to have a caesarean section?. *Scandinavian Journal of Public Health.* 2009; 37; 264-271.
- IV Kringeland T, Daltveit AK, Möller A. The relationship between preference for natural childbirth and the actual mode of delivery. A population-based cohort from Norway. *Birth.* In press.

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INTRODUCTION

The childbearing period is a period from one time that never returns to another and incorporates a profound and powerful human experience (Lavender 2006). For most mothers-to-be, pregnancy and childbirth are happy and enjoyable events described with feelings of empowerment, elation and achievement. Thus, this period in life includes a certain vulnerability for the woman and her child (Brudal 1996, 2000, Eberhardt-Gran et 2003) which might be associated with heightened levels of anxiety and emotion, pain and loss of control (Lavender 2006). Healthy children should be born by healthy and well-prepared parents with the least possible intervention (WHO 1997). The nature and priority status of maternal and child health has changed over time. For many centuries, the care of mothers was regarded as a domestic affair belonging to the realm of mothers and midwives, but was transformed into a public health priority during the 20th century (WHO 2005). Public health services offer routine exams to both low and high risk pregnant women. Whereas mothers were previously thought of as targets for well-intentioned programs, they are now increasingly claiming the right to access quality care as an entitlement guaranteed by the state (HOD 2009). In doing so, they have transformed maternal health from a technical concern to a moral and political imperative (WHO 2005).

Within the field of birth science, knowledge about almost every aspect can be acquired with the help of various techniques. The boundary between the principle of beneficence and dangerous possibilities has been exposed. A major part of risk assessment involves understanding and seeing over time that something is not right (Blåka 1999). Prenatal care is under scrutiny; we see a battle between professions, a battle over the allocation of funds within the health care system, a battle against medicalization, and a campaign against focusing on risks (HOD 2009). General and professional perspectives on risk differ from one another (O'Brien 1986, Blåka 1997). Respective groups of politicians, professionals and lay people have differing views about what constitutes acceptable risk, and this is also true within each of these groups. When people undertake an evaluation of normalcy and risk, they are influenced by a large number of factors, and most people do not base the possibility of an outcome or result on statistical odds but rather on their total understanding of life (Kahneman 1982, Berg 2002).

The aspect of a feeling of security constitutes a matter of trust in the system on the part of people, organizations and institutions concerned with security. This trust is related to a person's experience of mastery and control. Mastery and control can refer to the dangers to which the person is exposed or to which he/she exposes himself/herself (Hovden 1998). Knowledge about the individual in his/her biographic and social context provides insight into social dynamics (Elstad 1996). Many childbearing women have the greatest trust in expert knowledge and medical-technical measures and, for them, medical control means security and protection from risks (Endresen 1992, Kringeland 1993). For others, satisfaction with themselves, their own bodies, and trust in their own powers is what increases their sense of dignity, their freedom, and the choices they have (Endresen 1992, Fjell 1998). Reflections on the relationship between thought, knowledge and language have consequences regarding the issue of knowledge development within the field (Blåka 1997, Blakar 2006). This means that reflections on the question of knowledge have consequences regarding the content we assign to notions and what is perceived as safe or secure versus what is risky.

This thesis, which includes a subproject of the Norwegian Mother and Child Study (MoBa 2008), considers the user's perspective and includes research on women's desires concerning childbirth methods and how births actually occur. The sub-studies, of which three are based on the MoBa study, involve public health science, and the results of the studies are significant for health promotion and prevention measures. The results also have significance for the organization of institutions.

PREGNANCY AND HEALTH IN PUBLIC HEALTH

Broadly defined, public health is the art and science of preventing disease, promoting the health of the population and extending life through organized local and global efforts (Beaglehole 2003, 2008). The health of infants and mothers (Backe 2002), the quality of life and life experiences among mothers-to-be, particularly during pregnancy and childbirth, are of the utmost importance to the health and well-being of the whole family and an important factor within public health.

Health Prevention/ Medical Examination in antenatal care.

A significant part of the research on preventative health care is based on an understanding that perceptions of health and health-related behavior are an expression of individual choices. The health belief models of Becker (1974) and the concept of self-efficacy introduced by Bandura (1997) were intended to predict health-related behavior. These models have been criticized for being based on a narrow understanding of rationality and for placing too little weight on the social and cultural processes that are part of explaining people's health-related behavior. Health examinations are a central element in surveillance medicine (Armstrong 1995), where the medical focus is largely shifted from the ill to the potentially ill, that is, to healthy people. Along with the increasing focus on medical risk (Skolbekken 1995, 2000), sociological theories have been developed that look at the significance of risk in post-modern society (Beck 1994, Giddens 1991). At the center of these theoreticians' understanding of people's relationship to risk stands the reflexive, autonomous, modern human. This approach has also been criticized, starting with Michael Foucault's theory on governmentality (Petersen 1997). Prevention has been viewed as a form of execution of power, where the state protects its interests in preserving public health. Medical examinations constitute a large and increasing part of the public health care system's tasks. The public health care system's justification for health examinations such as in public prenatal care programs, assumes that people assess themselves as being at risk. Furthermore, there is an assumption that individuals react rationally by accepting an invitation to participate and, on the basis of information about their own medical status, react rationally by following expert advice and/or accepting treatment. The relationship between individuals and society and between gender-related similarities and differences is pushed to the extreme in building up the welfare state. Women as mothers and expectant mothers are participants and a target group – key participants in political policies

intended to create the optimal public health care system (Blom et al.1999). Public prenatal checks and care are a free offer to all pregnant women in Norway and are a part of the municipal level health care program. Pregnant women utilize this offer because they feel they are expected to, and because it is something that everybody does. The message from society is not only that this is a routine but also the best a woman can do in order to protect and foster her unborn child. Women's magazines as well as all health care education intended both for the public and for health care professionals reinforce this message. Although the women seem not to be able to define their reasons for attending antenatal care (Backe 2002, Dragonas et al. 1998), these messages have come through in such a way that there seems to be an accordance between women's and health care professionals views that antenatal care is an important medical care (Olsson 2000). An important aim for the Norwegian Directorate of Health is to base professional advice and decisions on the best available knowledge. This national clinical guideline for antenatal care (Helsedirektoratet (Norwegian Directorate of Health) 2005) focuses on information, advice and guidance rather than control. In this way it should become easier for pregnant women and their families to assume responsibility for their own health.

Health Promotion

Empowerment and salutogenesis are basic principles or concepts that have arisen since the late 1970s within "new" public health and health promotion. According to the Ottawa Charter (WHO 1986), "Health promotion is the process of enabling people to increase control over and to improve their health." This perspective is derived from a concept of health as the extent to which an individual or group is able to change or cope with their environment. "People cannot achieve their fullest health potential unless they are able to take control of those things which determine their health" (WHO 1986). The European Union links enabling health promotion to the empowerment concept by stating that "enabling means taking action in partnership with individuals or groups to empower them, through the mobilization of human and material resources, to promote and protect their health". Both empowerment and salutogenesis are elements of health promotion strategies. The concept of empowerment and the classical ideology of prevention in public health are different philosophical perspectives. The classical ideology of prevention in public health is based on a top-down or expert model, while the empowerment concept is based on a bottom-up model that emphasizes participation.

To give the concept of empowerment appropriate significance, a number of assumptions about the human being are made, such as that the human being has to be considered as a subject who is able to manage/control his/her own life and that empowerment enhances the possibilities for people to control their own lives (Rappaport, 1981 in Eklund 1999). Torre (1986, in Eklund 1999), and Rappaport (1987, in Eklund 1999) characterize empowerment as a process aimed at helping people to cope with their complex world. Wallerstein (1992, in Eklund 1999) defines empowerment as a multilevel construct that involves people assuming control and mastery over their lives in the context of their social and political environment as they gain a sense of control and purposefulness in order to exert political power through participation in the democratic life of their community and achieve social change. The psychological dimension of empowerment appears early and takes into consideration several factors. Empowerment is a sense of control over one's own life in terms of personality, cognition and motivation. It expresses itself at the level of feelings, at the level of ideas about self-worth, at the level of being able to make a difference in the surrounding world, and at the level of something more akin to the spiritual. It is a process ability that all of us have but that needs to be released (Rappaport 1985, in Eklund 1999). Thus empowerment at the individual level combines personal efficacy and competence, a sense of mastery and control, and a process of participation in influencing institutions and decisions (Zimmermann 1990b, in Eklund 1999). Empowerment cannot be given, it must be taken; individuals can only empower themselves. The professional's role is to nurture this process and to remove obstacles, the first being the professional's own need to define health problems for the individual and the community (Rappaport 1985, Labonte 1989a, Hunt 1990; all in Eklund, 1999).

The salutogenic concept is a deeply personal way of thinking, being and acting, a feeling of an inner trust that things will be okay, irrespective of what happens. The inner trust developed by internalizing the Sense of Coherence (SOC) concept allows us to identify, benefit, use and re-use the general resistance resources (GRRs) in our surroundings. Three types of life experiences shape the SOC concept: consistency (comprehensibility), load balance (manageability) and participation in shaping outcomes (meaningfulness) (Antonovsky 1979). A fourth concept, emotional closeness (which has later been added to the SOC concept), means the extent to which a person feels emotional bonds and experiences of social integration in different groups (Sagy and Antonovsky 2000). According to Antonovsky, GRRs distinguish between major psychosocial resistance resources: material, knowledge and

intelligence, ego identity, coping strategy (rational, flexible, farsighted), social support and ties, commitment (continuance, cohesion, control), cultural stability, magic, religion, philosophy and art (a stable set of answers) and, finally, preventive health orientation.

Participation is an important element in both the empowerment and the salutogenic concepts. However, it is not as explicit in salutogenesis, although Antonovsky (1996) indicates that participation in shaping outcomes (meaningfulness) is an important dimension in the development of a strong SOC. The fourth concept, emotional closeness, could also be seen as related to participation. Chamberlain (1997) points to not feeling alone – to feeling part of a group – as one of the qualities of empowerment. Gibson (1991 in Eklund, 1999) defines empowerment as a transactional concept because the process involves a relationship with others. Although empowerment comprises an individual demand, it is nurtured by the effects of collaborative efforts. Participation and being integrated in a group also seem to be elements of importance in both concepts. Another difference might be the control concept. In the empowerment idea it can be understood as related more to individual control, to taking control over something or someone. Antonovsky emphasizes that a person with a strong SOC is able to manage a stressful situation on his/her own or through a legitimate other. The control component in the SOC theory is not as central as in the empowerment idea.

It is probably not possible to give power to anyone but to create conditions that make it possible for people to manage and act on their own. The salutogenic environment comprises these positive and resourceful conditions that empower people. A salutogenic environment consists of empowered people. It is in the woman's body and with her resources that pregnancy and vaginal childbirth are carried through. One question is whether the woman understands the changes that happen in her own body (comprehensibility). Does she have resources to face stimulus and demand, resources to believe that she will manage strain, stress and trials during pregnancy and childbirth as well as before she became pregnant? Or is she facing the childbirth as a victim (manageability)? How does she view life and its presumptions? How does she experience being a childbearing woman? Does the woman want this baby? Does she like challenges or does she find (see) challenges as burdens that she would preferably be relieved of (meaningfulness)?

Pregnancy

A number of issues arise when a woman realizes she is pregnant, and her behavior is in accordance with opinions that are often culturally determined or expressed by experts. Pregnancy is described as a transition from one state to another (Brudal 1996), a time of numerous changes in a woman's physical, psychological and social disposition and directly linked to her own health and that of the unborn child (Barclay et al. 1997, Noland 1997, Bondas 2001). Research has consistently demonstrated that pregnancy is often a stressful event and brings about more profound changes than any other developmental stage of the family life cycle (Cowan et al. 1995, Priel et al. 2002). In addition to no previous experience with children, many women of today have no built-in family support to assist them in developing their role as mothers. This is the framework with which health professionals work in order to help individuals look ahead and plan appropriately.

Antenatal Care

Antenatal care is a unique part of health care services and includes all antenatal visits and check-ups, measures and referrals that are required during a normal pregnancy (Helsedirektoratet (Norwegian Directorate of Health) 2008). The approach to childbearing gradually changed from that of a folk medicine to a medical scientific perspective during the 20th century. The long Nordic tradition of antenatal care is considered to be one of the most used public health programs and an offer to all pregnant women. In Norway, a system with clear routines for antenatal services was established in 1984 (NOU: 1984) and revised in 2005. One goal was to ensure that pregnancy and birth proceeded normally and naturally, including the mother's physical and mental health and social well-being. Other goals were to ensure the health of the fetus, to ensure that the child be born alive and free from avoidable illness or injury, and to discover and treat illness and other factors that threatened the mother's health during pregnancy. In the early 1990s (Backe, 1991), public authorities added the stipulation that consultations should also include guidance and advice about pregnancy as a process of change, so as to enable the woman (and man) to take care of themselves and their infant in the best possible way (Bergsjø, 1998). According to general principles and values of perinatal care, drawn up by the WHO/EURO in 1998 and modified most recently in 2008, care for normal pregnancies and births should be de-medicalized, based on the use of appropriate technology, regionalized, evidence-based, multidisciplinary, holistic, family-

centered, culturally appropriate, and involve women in decision making (Helsedirektoratet 2008).

Until 1995, antenatal care in parts of Norway was provided solely by general practitioners, but legislation has since stipulated that antenatal care is to be provided by midwives in community health centers (Ot.prp 60 1994). Women with a normal pregnancy should be cared for by a midwife or a general medical practitioner, or by a general medical practitioner and a midwife working in cooperation. Routine referrals to a gynecologist at set times for women with uncomplicated pregnancies do not appear to improve the antenatal outcome more than referrals to a gynecologist when complications occur (Helsedirektoratet 2005, 2008).

Medical surveillance constitutes a large part of the standard program, which is based on good practice and research-based knowledge. Up to and including the 40th week of pregnancy, a basic program of eight check-ups, including an ultrasound examination between the 17th and 19th weeks, offered in order to determine the expected date of delivery, is recommended for healthy women with normal pregnancies. It is emphasized that for some mothers-to-be, extra check-ups will be required owing to psychosocial needs. Women who need more than the basic care that is provided receive care and treatment from the appropriate health care personnel when a problem arises (Helsedirektoratet 2008).

Birth

Everyone expecting a baby has ideas about labor and motherhood/fatherhood (Stainton et al., 1992, Brudal 1996, 2000, Blåka 1997, Berg 2002, Lundgren, 2002). Western women usually plan their lives, but it is not possible to plan every aspect of childbearing and birth (Hørnfeldt 1998, Brudal 2000). Pregnancy may end in spontaneous labor, which may result in vaginal birth or a cesarean section. Pregnancy may also end in a pre-labor intervention such as the induction of labor or an elective cesarean. Vaginal birth may be spontaneous or assisted with a vacuum or forceps. The emergency cesarean section done in labor after something goes wrong is likely to have a poorer outcome than the elective procedure. Similarly, not all vaginal deliveries are the same; the patient whose long and difficult labor ends with forceps and an episiotomy extended through the anal sphincter will have a poorer outcome than the woman who easily pushes her baby out. In reviewing birth outcomes, a risk–benefit analysis

must be careful to distinguish not just between cesarean section and vaginal deliveries, but between the subtypes (Plante 2006).

Normal Birth

Due to problems in defining a normal birth, the WHO (1996) has summarized the state of knowledge, issued practical recommendations for maternity care and formulated a definition of a normal birth: "... spontaneous in onset, low-risk at the start of labor and remaining so throughout labor and delivery. The infant is born spontaneously in the vertex position between 37 and 42 completed weeks of delivery. After birth mother and infant are in good condition" (WHO 1996, p. 6). Pain-relieving measures, the stimulation of contractions and CTG (Blix 2006) are not mentioned in the definition by the WHO (1996) or in the Norwegian textbook published by Bergsjø (2006). In Norway, 60% of childbirths would in 2003 be regarded as "normal" according to this definition (Blix 2006). In Brazil, the cesarean section rate in general is 40% (WHO 2005), while one third give birth at private hospitals, where the cesarean rate is more than 75% (Diniz 2004). In developing countries a high rate (1/100 in Nigeria) of maternal mortality (WHO 2007) might be seen as "normal".

Natural Birth

Corresponding to what is considered normal (Downe 1996), the definition of what is considered natural is something that changes over time and between cultures. According to G. Dick-Read (1890–1959), widely regarded as the father of the natural childbirth movement, the central claim was that "primitive" women do not have pain in childbirth. In contrast, women of the upper classes were "over civilized" and had been socialized to believe that childbirth is painful (Dick-Read 1933, 2004). His writings inspired advocates of natural childbirth such as Balaskas, Gordon, Gaskin, Kitzinger and obstetricians such as Odent (1984) and Davis-Floyd (2004). Active birth, alternative birth, soft birth, sensitive birth and physiological birth are used synonymously with natural birth (Fjell 1998). The number of women who give birth at home in Norway are few and are regarded as "special". Despite this, "natural and active childbirth" is not an option for women who choose alternative types of childbirth (Lindquist 1998). The concept of individuality, "natural" and "domesticity" embody an understanding of the health care "definition" of how a normal and good birth experience should be, and the English concepts of labor/labor pain in childbirth imply work.

In the perfect situation, women are able to do it themselves i.e. to act in a controlled way to take control over their own activities, to succeed and to reach the goal of giving birth to a healthy child (Lindquist 1998).

An extreme interpretation of natural birth would be allowing the birthing process to take its own course with no intervention. As this implies a high level of morbidity and mortality for the mother and child, it is highly unusual (Berg 2002). The concept of natural delivery is subject to cultural interpretations (Jordan 1994, Lindquist 1998): the perceptions are socially structured phenomena created by the people using them (Hørnfeldt 1998, Marander-Eklund 1998) and have a built-in positive value that may reduce the need for reflection. In the present study, there is no way to examine the true content of the concept, *as natural childbirth as possible* is discussed with a focus on women's own perceptions of a natural reality. All births in Norway are registered in The Medical Birth Registry of Norway (MBRN) (Appendix 1). The tally sheet has no place where a birth may be registered as natural, but there is a registration spontaneous, vaginal birth, no intervention, no complication.

Vaginal birth or cesarean section

The fact that vaginal birth is in accordance with the physiology of pregnancy and does not require invasive intervention favors the maintenance of the traditional preference for vaginal birth. As far as technology is concerned, the international literature concerning risks for the mother and child is characterized by heterogeneity, low standards of evidence and fundamental methodological problems (ACOG 2003, 2004).

New choices and new ways of doing things are slowly changing what is routine in the Western culture of birth (Fjell 1998, Lindquist 1998, Berg 2002, Lundgren 2002, Blåka 2002). At the same time, intervention during birth is increasing, although this differs from institution to institution (MBRN 2008). Of the many changes in obstetrical care during the 20th century, few have generated more attention and debate or had a greater effect on the process of birth than the inexorable increase in cesarean sections (Figure 1).

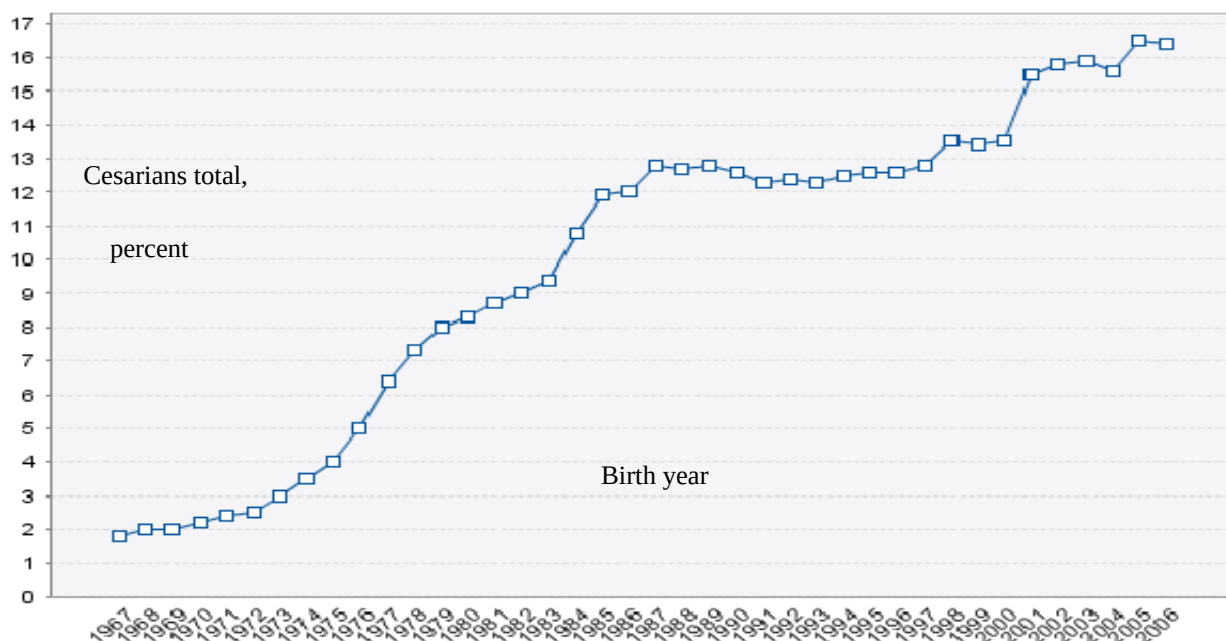


Figure 1. Cesaren sections in Norway 1967 – 2006

(MBRN 2008)

The same period saw similar substantial changes in maternal and neonatal morbidity and mortality. In 1937, 6% of primiparous patients died after cesarean delivery. The specter of death during childbirth hovered over each decision to proceed with a cesarean delivery, and everyone involved tolerated a greater degree of risk of maternal or neonatal complications from vaginal delivery than we accept today (Ecker et al. 2007).

Today, pregnant women are defined in relationship with a high or low risk of complications in pregnancy, birth and the puerperium. Factors from the women's medical history, current pregnancy, and physiological and socioeconomic factors are included (Dragonas 1998). Women at high risk are subject to increasing attention and care, both when they have risk factors and when actual complications occur (Berg 2002).

According to WHO, intervention can have negative effects (WHO 1996). Sober-minded and knowledge-based use of interventions should be applied in obstetrics (Backe et al. 2005). Routines required for the optimal birth have varied over time. Vaginal birth is the safest way for women to give birth and babies to be born if no clear, compelling and well-supported justification for another mode of delivery is indicated (Sakala et al. 2006). In Western countries delivery in a hospital has been considered routine and safe for many decades.

Maintaining health (WHO 1996, Helsedirektoratet 2005, 2008) and regarding pregnancy as a natural condition is a vital task.

It has been assumed that there has been a change in attitude among women who now often see it as a right to choose the mode of delivery. Women's need to control and plan the birth is a significant reason for the desire or request for a specific way of giving birth (Hannah 2000, Gamble 2001, Aslam 2003, Schindl 2003). A Norwegian study published in 1999 found maternal requests to be one of the two most frequent indications for an elective cesarean section (Kolås et al. 2003). Basic knowledge is lacking in many areas, however, and vaginal birth is still the method of choice for the majority of women asked (Hildingsson et al. 2002, Sunhedsstyrelsen 2005). Concerning the mother, no studies have compared the complications among healthy pregnant women who have a cesarean section purely on maternal request and pregnant women who choose to give birth vaginally (Sundhedsstyrelsen 2005).

RESEARCH AREA AND AIMS OF THE STUDY

Since childbirth became a matter of science in the 17th/18th century, the main focus has been the outcome of pregnancy and birth measured in maternal and infant morbidity and mortality rates. The main aim of this thesis was to study a perspective of women`s expressed wishes for mode of delivery and how they actually give birth.

The aims of the sub-studies were:

to examine the notion of risk, and to understand it in different ways as it is applied to childbirth (Study 1).

to examine what characterizes women who want to give birth as naturally as possible without painkillers or intervention (Study 2).

to examine what characterizes women who would, if possible, choose to have a cesarean section (Study 3).

to study actual mode of delivery and in particular the chance of natural childbirth among women who at week 30 of pregnancy expressed a wish to give birth as naturally as possible without painkillers or intervention. (Study 4).

MATERIAL AND METHODS

The Norwegian Mother and Child Cohort Study (MoBa) is a pregnancy cohort study initiated by two groups of researchers in perinatal epidemiology at the Medical Birth Registry and at the former Norwegian Institute of Public Health. MoBa (2008) is the largest and most costly study of its kind in Norway and has imposed multiple challenges economically, logistically and scientifically (Magnus et al. 2006). The planning has not been made on the basis of any single hypothesis or even any set of hypotheses (MoBa 2008). The objective is to test specific aetiological hypotheses by estimating the association between exposures and diseases for mothers and children, with the aim being the prevention of such diseases. The MoBa study, conducted by the Norwegian Institute of Public Health, is a cohort consisting of more than 100 000 pregnancies recruited from 1999 to 2009. Participants are asked to provide biological samples and to answer individual questionnaires covering a wide range of topics. Participants were recruited to the study through a postal invitation in connection with a routine ultrasound examination offered to all pregnant women in Norway at 17-18 weeks of gestation (www.fhi.no/morogbarn). Recruitment started at one single hospital and has, since January 2006, included 50 out of 52 hospitals with maternity units (Magnus 2006). The majority of all pregnant women in Norway were invited to participate, and the participation rate was around 44 %. Informed consent was obtained from each participant. The study was approved by The Regional Committee for Medical Research Ethics and the Norwegian Data Inspectorate. The protocol is described in detail elsewhere (FHI 2005).

Data Collection

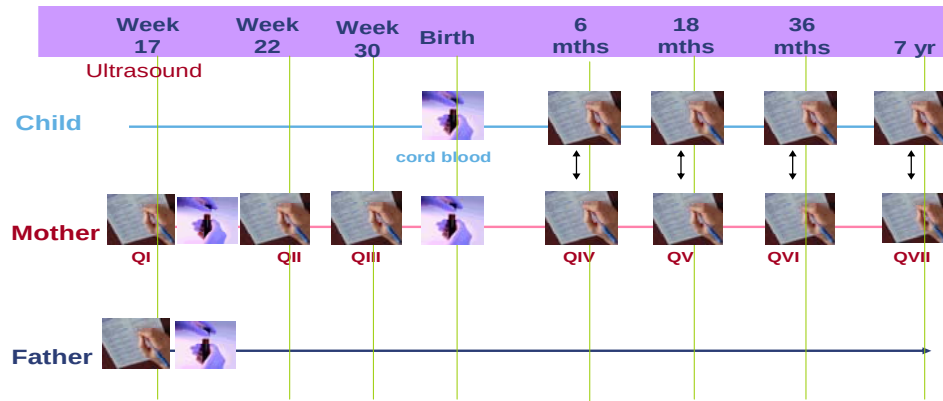


Figure 2. Data collection, shows from whom and when individual questionnaires are filled in and blood samples provided in the national MoBa study (MoBa 2008).

All MoBa data used in this thesis are filled in Questionnaire III at week 30 (Appendix 2).

The Medical Birth Registry of Norway (MBRN) was established in 1967, as a political reaction to the thalidomid tragedy, to monitor maternal and perinatal problems. The registry has been based since 1999 on compulsory notification of all births after 12 weeks of gestation (Irgens 2000) and has since 2002 been managed as a department of the Norwegian Institute of Public Health, located in Bergen. The notification form gathers data on the mother's demographic variables, maternal health before/during pregnancy, complications/interventions during pregnancy/delivery, and the newborn. The form, completed by a midwife or a physician, is sent to the MBRN within nine days after birth or discharge from the institution (Appendix 1). Norway has had a central registry of all inhabitants since 1964 including a personal and unique identification number. Records of the MBRN and the Population Registry are matched for mutual updating to assure the medical notification of every birth (Irgens 2000). In the present study, MoBa data are linked to data from MBRN.

Research Design

Paper I is an essay. The design of paper II, III and IV, a subproject in the MoBa study, includes two types of non-experimental design: cohort design (Paper IV) and broadly speaking cross-sectional design (Papers II, III and IV). The cohort design is appropriate for

following up the cohort over time (Rothman et al. 2008). The latter kind of cross-sectional research is appropriate for describing the status of phenomena or describing relationships among phenomena at a fixed point in time (Polit & Hungler 1999, Ringdal 2007, Rothman 2008).

Participants / Study Population

Our research file (version III, released in April 2007) contained information on 55,859 pregnancies. Our study population included all MoBa participants who filled in a questionnaire during week 30 of their pregnancy that was available from the MoBa by January, 2007. With a participation rate of nearly 44 % in the main MoBa study and a response rate of 92 -98% to Questionnaire III, evidence related to the representativeness of the final sample is low. Some possible biases caused by the low participation rate and the response rate are shown in Table 1 and need to be taken into consideration.

The MoBa Questionnaire and the MBRN Notification Form

The studies are based on individually reported information from one questionnaire (Figure 2, Questionnaire III) and register data from MBRN, linked by women's national identification number. In addition to individually reported information in the MoBa questionnaire, data on the mother's age, parity, physical health before and during the pregnancy, previous cesarean sections, and actual mode of delivery were collected through a linkage to the MBRN.

Outcomes

In Papers II and IV, we used an outcome variable constructed especially for the MoBa study: individually reported information during week 30 of pregnancy for desiring a natural birth. The question the women had to answer was, "I want to give birth as naturally as possible without painkillers or intervention," and all women had to tick one of six boxes with the following alternatives: agree completely, agree, agree somewhat, disagree somewhat, disagree, disagree completely.

In paper III, the statement, “If I could choose I would have a cesarean,” with the same six response alternatives, agree completely, agree, agree somewhat, disagree somewhat, disagree, and disagree completely, was used as the outcome variable and was also constructed especially for the MoBa study.

In Paper IV, data on the actual mode of delivery were collected from MBRN. In addition, we used data from the MoBa study on preferences for “birth as naturally as possible without painkillers or intervention” during week 30 of a pregnancy in a combination with data from the MBRN on the subsequent mode of delivery.

Exposures

Included in the MoBa Questionnaire at week 30 (used in Papers II, III and IV) were health variables, obstetric history and health outcomes, items dealing with lifestyle factors, and socioeconomic factors including marital status and work during pregnancy. Under lifestyle there were questions about smoking, the use of alcohol and physical activity. In addition, there were questions on the number of fetuses in the current pregnancy and if it was a planned or unplanned pregnancy. Questions dealing with feelings related to childbirth such as dread about giving birth, worrying all the time that the baby will not be healthy or normal, really looking forward to the baby coming, and thinking the woman herself should decide whether or not to have a cesarean (FHI 2005) were included, as was a set of standardized scale variables concerning psychosocial health: Satisfaction with Life Scale (SWLS) (Vittersø 1998); questions related to partnership satisfaction, Mehrabians Marital Satisfaction Scale (Blum et al., 1999, FHI 2005; questions on depression and questions on anxiety, SCL-8, (Strand et al 2003); questions on joy and anger, Differential Emotion Scale (DES) (Izard 1993), Generalized Self-Efficacy scale (GSE) (Røysamb 1997), and Rosenberg self esteem scale (RSES) (Rosenberg 1965) and questions on life events (Coddington 1972). Data concerning physical, psychological and sexual harassment as a child or an adult were collected in the same Questionnaire (Paper III), as were satisfaction with antenatal care health services.

Statistical Analyses

Paper II

The outcome variable, “I want to give birth as naturally as possible without painkillers or intervention”, was dichotomized into a score ≤ 3 . Differences in proportions between groups according to parity, age, grade level, obstetric history, different elements in this pregnancy, whether the pregnancy was planned or not, assisted/non-assisted pregnancy, number of fetuses, lifestyle, illness, physical problems, feelings related to childbirth, social, and intra-psychological and relation phenomena were evaluated with Kruskal Wallis tests (data not shown) and by cross tables with the chi square test. In post hoc analyses we also changed cut-off points into scores of 1-2 versus scores of 5-6 without any change in findings except a stronger tendency in most results. Unconditional logistic regressions were used to assess the predictive power of the sociodemographic characteristics of the women, obstetric-related health variables, intra-psychic phenomena, and attitudes. The size of the effect of these predictors was quantified using odds ratios with 95% confidence limits. A test for trend was computed using linear representation of the predictors in the logistic model. In the logistic regression analysis, age, parity and education were included as confounders. In repeated analyses, where the independent variables were analyzed as continuous variables, we found consistent results (data not shown). Statistical analyses were carried out with SPSS 14.0 for Windows.

Paper III

Multivariate unconditional logistic regression was used to assess the association to socio-demographic characteristics of the women, obstetric-related health variables, lifestyle, attitudes, intra-psychic phenomena, and violence. The size of the effect of the associations was quantified using adjusted odds ratios with 95% confidence limits and corresponding p-values. Proportions of women reporting a wish to have a cesarean section were dichotomized into scores of 1 – 3 (yes, want to have a cesarean section) and scores of 4 – 6 (no, do not want to have a cesarean section) and evaluated by cross tables with the chi square test. In post hoc analyses we changed cut-off points into scores of 1-2 versus scores of 5-6 with a stronger tendency in most results. For predictors of more than two levels, a test for trend was computed using linear representation of the associations in the logistic model. In the logistic

regression analyses, age, parity and education were included as confounders. In repeated analyses, where the reported variables were analyzed as continuous variables, we found consistent results. Statistical analyses were carried out with SPSS 15.0 for Windows.

Paper IV

Crude relative risks (RR) with 95% confidence intervals (CI) were calculated using contingency tables. Pearson's chi square tests were performed to test differences between proportions. All linear regression models were checked for possible violations of the model assumptions (constant linearity and homoscedacity). Log-binominal regression with the use of general linear models (procedure GENLIN in SPSS) was used to evaluate confounding and to adjust for confounding variables. The estimation of the relative risk of vaginal birth without any intervention and the relative risk of any vaginal birth was made by comparing the probability of any birth outcome exposed to a desire for the mode of delivery and other selected and independent factors used in paper II and III. A Cox regression model was used as an alternative method when log-binomial regression did not converge and failed to produce estimates. All covariates were represented with categories, and all analyses were adjusted for maternal age, birth order and maternal health before pregnancy. The p-values were two-sided, and a 5 % level of significance was used. All statistical analyses were made with SPSS 15.0 for Windows (Hellevik 2002).

Ethical Considerations

The Declaration of Helsinki (WMA 2008) includes a statement on ethical principles in medical research involving human beings; the most essential being that considerations related to the well-being of humans should take precedence over the interests of science and society. In Norway (Myklebust 2004), as in other Nordic countries (Mortensen 2004), it is emphasized that there should be a reluctance to establish registries containing all aspects of the individual's life and that data should preferably be anonymized or pseudonymized. Accordingly, the national Norwegian Data Inspectorate has been very restrictive in granting licenses for the establishment of new registries. Barriers to conducting research for a wide range of purposes and through linkages with registries and bio banks still exist because of legislation and political and administrative routines. Every scientist should bear in mind,

however, that the use of sensitive information in research is justifiable only when the studies serve widely accepted aims and are designed and carried out according to the highest standard of quality (Gissler et al. 2004).

The MoBa cohort study is designed to include 100,000 pregnancies and was approved by the Regional Committee for Medical Research Ethics (Magnus 2006). About two weeks before the routine pregnancy ultrasound examination (around the 17th week), the women were invited to take part in the study. They received an envelope containing an information folder, two questionnaires (questionnaires I and II - not used in the present study) and a consent form where they are asked to give informed consent for participation and for data linkages and follow-up. The invitation sent out in collaboration with each participating hospital describes the purpose of the study, data linkages, follow-up, information on the protection of privacy and practical details. It is emphasized that participation is voluntary, and it is made clear to the women that they can withdraw at any time (FHI 2005). The completed questionnaires and consent forms were sent to The Medical Birth Registry in Bergen (MBRN 2008). Papers II, III and IV are based on anonymized data from MoBa and MBRN. Such studies are exempt from institutional review board approval in Norway (Irgens 2000).

SUMMARY OF RESULTS

Paper I

A study was conducted to examine the notion of risk and medicalization and to understand this in different ways as it applies to pregnancy and childbirth. To meet the ever more specialized welfare demands, options and offerings in the population, the orientation of the state's welfare policy is becoming more specific and differentiated. One important consequence of these ever closer ties between the state and the individual is the change in what it means to be ordinary/normal or vulnerable/ in the at-risk group. Risk and security are often defined as being complementary. The safe and the risky are anchored in different symbol systems, however, and views vary as to what constitutes acceptable risk. The biomedical perspective of childbearing focuses on biological, hormonal and psychological changes. The human body in its extension is seen as a machine, and childbearing is treated as an illness. Childbearing is not expected to be a normal part of life but as nine months of risk. In another perspective, childbearing is seen as a natural biological and social-psychological process comprising an experiential dimension. From an extreme point of view, all interventions are allowed for in a natural process. High levels of morbidity and mortality can be the relatively uncommon result.

General perspectives on risk differ depending on both the person and the profession. More and more pregnant women are in danger of being considered deficient and in the danger zone. Figures on risk are not objective values and the association between risk and security is socially and culturally determined. Personal symbols can be basic assumptions about oneself or the life one leads, and the childbearing woman has preferences of her own.

Paper II

The characteristics of women who, with their own perceptions of natural reality, wanted a natural childbirth were examined. Background variables/characteristics are shown in Table 1. Nearly three out of four women (72 %) women wanted to have as natural a birth as possible at week 30 of their pregnancy; 29 % agreed completely to this statement. Eight per cent of the women disagreed totally and would not have a natural birth at all (Table 2). In the multiple logistic regression analyses, positive experiences from previous births, no dread of giving birth and no previous cesarean section increased the rate of wanting a birth as natural

as possible without painkillers or intervention. In addition, expecting the first child, having given birth more than once and reporting positive intra-psychic phenomena are significantly associated with the wish for a natural birth. Younger women and women who reported no health problems in pregnancies before the present one were more likely to prefer natural delivery. Non-smokers preferred a natural childbirth to a greater extent than smokers. A significant association was also found for use of alcohol. Women who were physically active more than once a week were more likely to prefer a natural childbirth than less active women. No significant associations were found for work during pregnancy, marital status, unplanned pregnancy, previous stillbirth, miscarriage or abortion.

Paper III

The aim of this study was to describe the characteristics of pregnant women who at pregnancy week 30 wanted a caesarean section. Nearly 56,000 women are included in this paper, as in the study described in paper II (Table 1). Ten percent of respondents wished to have a caesarean section if possible, but only 3 % were quite sure (Table 2). Sixty percent had no desire to have their baby delivered surgically (Table 2). Thirty three percent thought that the woman herself should be allowed to decide whether to have a caesarean section or not. The highest odds ratio was observed in the analysis of birth experiences, fear of giving birth and a positive attitude towards a free choice of a caesarean section. No positive or negative experiences from previous pregnancies, fear of giving birth, reporting negative intra-psychic phenomena, a second birth, age >35, low educational level, single, out of work, assisted conception, > 1 fetus, urinary and bowel incontinence before this pregnancy and pelvic pain are significantly associated with the wish for a caesarean birth.

Table 1

Data from the Norwegian Mother and Child Cohort and the Medical Birth Registry of Norway 2000-2006.
Characteristics of all women who gave birth in the years between 2000 and 2006, 55,859 women who filled in MoBa questionnaire III, 39,475 women who wished for a NB¹ and 5,468 women who wished for a CS².

	Gave birth in the years between 2000 - 2006	MoBa participants	Wished for NB	Wished for CS
	%	%	(%)	(%)
Parity 0	41	44	44	37
Parity 1	36	36	35	42
Parity 2 +	23	20	22	22
Maternal age < 25	17	12	12	13
Maternal age 25-34	67	72	72	67
Maternal age 35 +	15	16	16	21
Married/cohabitted	92	97	97	96
Not married/cohabitted	8	3	3	4
No previous cesarean section			94	75
Previous cesarean section			6	25

¹ Birth as naturally as possible without painkillers or intervention

² Cesarean section

Table 2

Data from the Norwegian Mother and Child Cohort and the Medical Birth Registry of Norway 2000-2006

Required way of giving birth at week 30 (Papers II and III)

	Want to have as natural a birth as <u>possible</u>		Want to have a cesarean section	
	N	%	N	%
Agree completely (1)	15 759	29	1835	3
Agree (2)	12 643	23	937	2
Agree somewhat (3)	11 073	20	2696	5
Disagree somewhat (4)	4 560	8	3092	6
Disagree (5)	6 123	11	13 541	25
Disagree totally (6)	4 499	8	32 459	60

Paper IV

The objective of this study was to discuss the impact of a woman's preferences in week 30 of pregnancy regarding the mode of delivery for the subsequent birth. Data on 39,475 pregnancies of participants in the MoBa study where the pregnant woman in week 30 of pregnancy responded positively to the item "I want to give birth as naturally as possible without painkillers or intervention" are included in the substudy. This cohort corresponds with the "Yes" group in paper II. As the main outcome we used vaginal birth with no intervention (natural birth). Natural birth was defined as normal occipital presentation and no action (induced labor, chemical anaesthetics/analgetics, epiciotomy, forceps, vacuum extraction, cesarean section). Any vaginal birth was used as a secondary outcome. Overall, 47.2 % of the

women who wanted a natural birth had their preference fulfilled, however. Primiparas had a much lower chance than multiparas to have their wish fulfilled regarding having a birth without intervention: 29.3 % compared to 61.1 % of the multiparas. Both for primiparas and multiparas, the strongest predictor of not having a natural birth in line with their wish was to expect more than one fetus. Other strong predictors were maternal age above 35 years of age (primiparas), previous cesarean birth and previous negative birth experience. In general, the effects of the various predictors were stronger for primiparas than for multiparas.

Standardised scale variables related to emotional well-being such as the Symptom Check List (SCL-8), Differential Emotional Scale, Satisfaction with Life Scale, Relation Satisfaction Scale, and Generalised Self-Efficacy scale had some impact on the chance of natural birth among primiparas and a limited effect among multiparas. Fear of giving birth predicted non-natural birth both among both primiparas and multiparas.

DISCUSSION

Reflection on the results

As many as 72 % of the women wanted for a natural birth when asked in week 30 (Paper II). Even considering a possible selection bias caused by a response rate of 44 %, the numbers indicate a positive attitude towards natural birth among Norwegian women. The figure on vaginal births with no intervention was highest in the group of mothers who wished for as natural a birth as possible (data not shown). However, many women who wished for as natural a birth as possible without painkillers or intervention had interventions or even a cesarean section (Paper IV). A vaginal birth is the safest way for women to give birth and for babies to be born if there is no clear, compelling, well-supported justification for another mode of delivery (Sakala 2006), even as a homebirth (de Jonge 2009). Still, generally accepted risk situations may have arisen and made intervention necessary. In addition, there might have been a mutual understanding between the women and the health care personnel that a cesarean section or other intervention was a preferable solution.

Among the primiparas (Paper IV) who wanted a natural birth, only 29 % actually had a vaginal birth with no interventions and the figure for cesarean section was 15%. Since the major part of the health expenditure comes from public funding, the proper reliance on expertise of medical experts as a public actor has consequences (Backe 1999, Bergsjø 2006, 2007). The fact that vaginal birth is in accordance with the physiology of pregnancy and does not require invasive intervention favors the maintenance of the traditional preference for vaginal birth. Traditionally, health care personnel have been the main source of information and attempts are made to offer advice based on research and individual women's preferences (Bergsjø 2006). Antenatal care, as a unique part of health care services in Norway should strive to enable women to make informed choices and decisions (Alexandersson 2005, Ruland 2005) and thus to feel more strongly in control during pregnancy and labor. The reasons for a woman desiring a specific mode of childbirth can be numerous and diverse. Advocacy of patient choice requires preserving vaginal birth options as well as cesarean sections. A question that should be asked, however, is why a cesarean and not a vaginal delivery is framed in the language of choice (Leeman 2005). There is an acknowledged gap between research and clinical practice within health care for women during pregnancy and childbirth, (Bergsjø 2006). Most health care studies are carried out without knowing whether the information about risk will weaken the factors affecting health-related risk or will

contribute to those factors affecting better health (Stortingsmelding 16, 2003). Satisfaction with antenatal check-ups was not associated with increase in vaginal birth with no intervention (data not shown). Neither was dissatisfaction associated with an increase in birth with interventions among those who had such a preference. This could indicate that the women had other individual and personal reasons for their wishes and do not regard health professionals as a “significant other” (Endresen 1992, Kringeland 1993).

The literature stresses the importance of ensuring that the woman is given enough information to make an informed decision. It is not clear, however, what information women are in need of, in what form the information should be given, or who should give it (Sundhetsstyrelsen, 2005). Traditionally, health care personnel have been the main source of information, but information and support from “dolas” and medical information from books, magazines and from the internet is now available. All this information and knowledge may result in mothers-to-be who feel empowered and able to make informed decisions. On the other hand, the possible broadening of health knowledge may also result in the effect of a great insecurity among these women; what should they do and how should they behave (Førde 1996). In the worst case, information and knowledge may end in a negative circle of failures and suffering (Bondas 2001), before during and after the childbearing period. Accordingly, because of all this information and expectations from self and others, a woman’s feeling of uncertainty may influence her preference for mode of delivery before pregnancy and in pregnancy before and after 30 weeks and how to assure a safe childbirth for the baby and herself.

Everyone expecting a baby has ideas about labor and motherhood/ fatherhood. The wish for a healthy child may apparently be taken for granted and the fact that parturients want to assure a safe childbirth and a healthy newborn. As mothers-to-be have no established right to choose vaginal birth, could women then lose the choice of vaginal birth altogether? Another question is whether the possibility of having a vaginal birth can easily be changed into asking each childbearing woman whether she really wants vaginal childbirth (Backe 2003, Leeman 2005). The explicit requirement for responsible health care assistance (Ot. Prop. 1999) is not constrained by purely medical conditions and is especially not associated with professional personnel’s personal opinions. The requirement for responsible activities is closely associated with ethical judgments, the obligation to seek support and the obligation to cooperate (Braut, 2008). A woman’s right to choose a vaginal childbirth is not addressed. Biologically, being a woman brings with it the opportunity to become pregnant and to have a vaginal birth. Seen as a duty, where she ceases to desire the children for which she was primarily made and where

her true emancipation lies in freedom to fulfill her biological purposes (Dick-Read, 1933, 2004), childbearing represents both power and powerlessness. Accordingly, one question that can be posed is whether a woman has the right to have as natural a childbirth as possible or whether it is her duty to give birth in a natural way (Blom et al. 1999). A request for a given way of giving birth might be a response and an objection to this “duty”. Professional(s) working with antenatal care have a responsibility for both good processes and good medical and professional assessments. The opinions of both the childbearing mother and her next-of-kin must be considered and, in those cases where it is not possible to follow a woman's preferences, a thorough and open argumentation is demanded from those with the professional responsibility (Braut, 2008). Long gone are the days when a single midwife or obstetrician handled a caseload of women to whom he or she made the extraordinary commitment to attend her birth, no matter when that woman went into labor. Now, the overwhelming majority of obstetrical practices are group-based, substantially reducing that individual bond with a mother. In contrast to recommendations in the newly published white paper (HOD 2009), many women have never met the person who delivers their babies, neither the midwife nor the obstetrician, if involved. Preserving pregnancy and childbirth as a natural process is an essential part of human existence (Leeman 2006). Embodied knowledge, consisting of practical, theoretical, and sensitive knowledge, is crucial for the care of women both with no risk and at risk. This is possible through a sensitivity for the spontaneous, a mutual relationship with the woman cared for, an enduring presence, and a constant struggle to achieve balance between medical and natural perspectives (Berg 2002). A woman in labor has the right to expect that her midwife/doctor/obstetrician will not exploit her natural fears, concerns and discomfort to perform an operation for which there is no good medical reason when the mother and baby would do best by allowing labor to continue.

Among the primiparas (paper IV) who wanted a natural birth, 3 % had an elective cesarean section and 12 % ended their pregnancy with an acute cesarean section. According to WHO, in normal birth there should be a valid reason for interfering with the natural process (WHO 1997) and a sober-minded, knowledge-based approach should be used regarding intervention (Backe 2005). Advocates of patient choice cesarean delivery have taken the position that, although safety data are inconclusive, we should support the decision of a well-informed woman to choose cesarean delivery. This standard is not applied in most areas of medicine; we prefer to compare safety data on the new intervention with those on the old. The question on patient choice cesarean birth, however, asks only whether a woman should have

the right to choose a cesarean delivery in the absence of a medical indication. On the other hand, there is a discussion whether a woman has a clear right to refuse a cesarean birth. In those who were delivered with a cesarean section and actually wanted as natural a birth as possible, the solution might have been arrived at in a mutual understanding between the women and the health care personnel. To carry out a procedure against the will of the mother-to-be, however, is contrary to the right of self-determination. The worrying trend of increased cesarean section in first-time mothers must be taken into consideration, especially because of the maternal wish for repeated cesarean (paper III), the reported increasing rate of repeated procedures (Singh 2004, Shorten et al. 2005, Lydon-Rochelle et al. 2006, Montgomery et al. 2007) and neonatal problems in subsequent births (Hemminki et al. 2005, Fogelson et al. 2005). Still, to save a life, it might be essential to have a cesarean section (Lyng et al. 2005). In such a case, the mother-to-be and her next-of-kin are entitled to a full explanation of the circumstances before granting or refusing consent (Horey 2004, Braut 2008), because a respectful dialogue among those involved may reduce discomfort and prevent or reduce bad birth experiences and because the last birth experience may overshadow experiences from previous birth(s) (Sethi 1995). Fortunately, the legal right for a woman to refuse a cesarean section in almost all situations is well established. To reject an offer, however, may leave the woman in the difficult position of having her birth attended by a physician or midwife with whom she is in conflict. As we advocate vaginal birth after cesarean and vaginal breech delivery (SMM 2003) in our hospitals (Bergsjø 2007), we may actually make outcomes worse: women who believe their choices will not be respected in such situations may prefer to stay home (Lieberman 2004). From another point of view, as the national cesarean section rate increases (MBRN 2008), expectations will shift away from any concept of normal as it pertains to birth. One result might be that labor and delivery units will be in the surgical suite. Hospitals can profit from the higher charges (DRG points) for elective cesareans, and hospital staffing is less complicated as well. In Norway, the use of private services in antenatal care are unusual. For the future, however upper class mothers-to-be may if possible choose private services or private hospitals for their deliveries so that their specific required mode of delivery is fulfilled.

Although there are undoubtedly some women who do seek elective cesarean sections, they are hardly enough to increase the number of cesareans by 10% from 1990 – 2008 and by 4 % from 13 to 17 of all deliveries (MBRN 2008). We suggest that it is not primarily about mothers pressuring doctors to take what they perceive to be the "easy" way out, as

contemporary media coverage would have us believe. Focusing on maternal requests obscures a more complex story concerning changes in obstetrical practice (Fuglenes et al 2008, Bergholt et al. 2004). In addition, although some studies do describe an increase in cesarean sections without any medical indication, this may not represent real "maternal requests" at all (Plante 2006, Weaver 2007).

Fear of giving birth was associated to a wish for a cesarean section in all women (Paper III). One possible reason could be the medical mindset of the general population and ideas on what is perceived as risky (Kringeland et al. 2006). When people undertake an evaluation of normalcy and risk, they are influenced by a mixture of facts and beliefs, even myths and not just by evidence-based medicine (Berg 2002). As related to childbirth, fear is described as losing oneself into loneliness (Nilsson et al. 2007) and seems to be based on extremely complex and multi-factorial conditions that are very individual. Fear of childbirth might affect women in such a way that they start to doubt themselves and feel uncertain of their ability to bear and give birth to a child (Nilsson 2007). Especially for the neonate (Ecker 2007), women are willing to accept an intervention in exchange for a measure of potential benefit. Although no dread of giving birth was associated to a wish for a natural birth at week 30 (Paper II), fear of giving birth also predicted a non-natural birth in this subgroup (Paper IV). Reflections on the question of professional and scientific knowledge within the field of childbearing (Fuglenes et al. 2008, Bergholt et al. 2004) have consequences for what is perceived as safe or secure versus what is risky. An ideology anchored in a biomedical way of thinking has contributed to definitions of what is valuable and true knowledge. The ideology has also set norms for what is normal and what is pathological (Blåka 1999). Foetal injury, decreased risk of pelvic floor injury, maintenance of sexual functioning and patient convenience have been cited as motives for women's desire for a cesarean section (Wax 2004), in addition to psychological reasons of fear of giving birth and previous childbirth experiences (Saisto 2003, Hildingsson 2003, Waldenström 2004, 2006a, Wiklund 2007, Weaver 2007). Asking women about their emotions regarding the mode of delivery in week 30 of their pregnancy may hence increase the opportunity to provide adequate support and possibly both increase the rate of vaginal birth without intervention and reduce the rate of cesarean sections. Given the relatively high frequency of women who expressed fear of giving birth, this could reduce the use of interventions during delivery on a population level.

We do not know what was the case in those who at week 30 did not wish for a procedure but gave birth by cesarean: whether the surgery was sought by the mother or based on a physician's advice. There is a danger, however, that medical screening examinations, besides the obstetric complications, can increase anxiety and a feeling of helplessness, and make a healthy woman dependent on medical technology. As with the introduction of many obstetric procedures (Hestnes 2008), primary elective cesarean delivery may become widely disseminated before the potential risks to women have been determined. The history of obstetrics includes for instance many interventions that have entered clinical practice without evidence of benefits to women or their infants, such as continuous electronic fetal monitoring (Blix, 2006) and episiotomies (Hartmann 2005). Once introduced into practice, intervention tends to persist. Despite clear evidence that continuous electronic monitoring of low-risk pregnancies is of no benefit (Blix 2006), many laboring women undergo continuous fetal monitoring (MBRN 2008).

Childbirth described as an unavoidable situation, demanding both control of and loss of control, as going with the flow and at the same time taking command of one's self (Lundgren 2005), may also have caused feelings of helplessness, especially if the women were experiencing that the process of childbirth was not progressing. Trust in the competence of the staff and in themselves and support from their partner and midwives are found to be significant empowering factors in managing the birth and in having positive childbirth experiences (Bondas 2001, Berg 2002, Hildingsson 2003, Melender 2006).

Even among multiparas who at week 30 wanted as natural a birth as possible, previous birth experiences were one of the strongest risk factors for not having a vaginal birth (Paper IV), a conclusion that is strengthened by other studies (Hildingsson 2002b, 2008, Källen 2005, Pang 2008). We do not know the reason for this: the associations may be related to medical indications that occurred, irrespective of the preferred mode of the delivery or previous experiences. One explanation may be that a woman who wished for a natural birth answered according to what she would prefer rather than to what was realistic. Another explanation may be that the woman neither discussed her wish for mode of delivery nor her bad experiences; she was not asked, did not tell anybody and got no help.

We do not know if these negative birth experiences were caused by unexpected medical problems (Bondas 2001) or an acute cesarean section. Nor do we know if they occur by an

assisted vaginal birth when an unassisted vaginal birth was expected (Wiklund 2008) or by factors influenced by caregivers (Melender 2006, Waldenström et al. 2006b, Biro et al. 2004, Lundgren 2004). Newly published reviews conclude that one of the main reasons for mothers to request an elective cesarean was fear for herself or the child (McCourt 2007, Gamble 2001). Wish for a cesarean section (Paper III) was greatest in those who had given birth once. This may be in line with Pang (2008) who found that fear of vaginal birth was the most important reason for the women to change their mind from preferring vaginal birth the first time to wish for cesarean section at the second birth. A woman's experience of giving birth is highly individual, however, and not necessarily associated with an external framework or the actual course of obstetric events. Previous acute cesarean section, previous difficult delivery with suboptimal maternal or fetal outcome, a medical problem before pregnancy or in pregnancy, psychological problems with fear for her self or the baby are all variables that can be associated with fear of birth and bad birth experiences. Women who have not given birth before do not know what to expect. Still, some fear giving birth. Para 1 women may have gone through a difficult first-time delivery and para 2+ women may have experienced that labor becomes easier after the first birth. This highlights the need for professionals to advocate the optimal childbirth experience, also with respect to a woman's future reproduction.

While preferences for a natural birth were highest among women younger than 25 years of age, a wish for a cesarean section was associated with women aged 35+ (papers II, III), and advanced age is a strong risk factor for not having a "natural birth" (paper IV). The probability of having many children is lower for women who are close to menopause than for the youngest women of fertile age. Related to mortality/morbidity for the mother and child, however, a cesarean section is not safer than a natural birth (Vangen et al. 2003, Häger et al. 2004, Liu et al. 2007, Bergsjø 2007). A higher mean age suggested as an important reason for the sustained rise in cesarean (Bergsjø 2007, Hildigsson 2006, Källen 2005) is confirmed in several studies. Because pregnancy and childbirth cannot be separated, an objectified view of her body by the mother herself and caregivers during pregnancy can be a problem for a woman during childbirth (Lundgen 2002). This is a cause of concern if women of a specific age are being subjected to increasing attention and care that is unrelated to risk factors and the occurrence of actual complications. Whether age is viewed as a risk or not in antenatal care and in lay people may be of importance. The professional's role is to nurture the empowerment process and remove obstacles. We do not know if the women involved in our

study and the professionals differ as to what constitutes acceptable risk or danger. The fact is, however, that simultaneous with an increase in cesarean sections, Norwegian first-time mothers who live in large urban areas are older than has previously been the case (MBRN, 2008).

Women in present study with more than 12 years of education wanted a natural birth to the highest degree (paper II), while there were small differences between women with 12 years of education and those who had less. A desire for a cesarean section was also significantly associated with education (paper III); those with the lowest level of education preferred a cesarean to the highest degree. In addition, in line with Hildingsson et al (2002a) and Tollånes et al. (2008), low education was associated with an increased risk for a cesarean section in women who wished for a natural birth (Paper IV). A trend toward an increasing number of elective cesarean sections requested by upper-class mothers (Weaver, 2007) has, for years, featured in the headlines of Western tabloids. No systematic evidence of the catchy phrase “Too posh to push” is available. Women in the present study who had the opinion that the woman herself should decide whether or not to have a cesarean section (paper II) did not prefer a natural birth. Such opinions were associated with a wish for a surgery (paper III) and with a cesarean birth, irrespective of wishes for the mode of delivery expressed at week 30 (data not shown). In Norway and other Scandinavian countries (Tollånes 2007, Hildingsson 2002, 2008, Källen 2005, Sundhetsstyrelsen 2005), women with the lowest level of education had the highest number of cesarean births. This trend could be accounted for by an increased occurrence of cesarean sections based on maternal requests among the lowest educated. An interesting finding was that the women who did not have their wishes fulfilled regarding natural birth were women with a low level of education (Paper IV). Increasing vulnerability in the lowest educational group due to knowledge and language as an instrument of power (Blakar 2006) might contribute to this trend. Although a low level of education was associated with a desire for a cesarean section, some highly educated women also wanted a surgical birth (paper III). Highly educated women may be in control and capable of making decisions (Lehmann 2007, Weaver 2007) and may be more willing and better able to express their desire for the mode of delivery.

Methodological aspects

Internal Validity

Measurements of effects may be biased because of a lack of internal validity or due to a lack of precision. A common way to reduce random error or to increase the precision of an estimate is to enlarge the size of the study (Rothman 2008). Internal validity depends on the presence of systematic errors (Hellevik 2002, Ringdal 2007). Reporting bias can introduce errors. A possible difference between idealistic opinions during pregnancy and true opinions at birth should be mentioned. Previous health has been defined as none-special conditions before pregnancy or a diagnosis line-up such as; asthma allergy, recurrent urinary tract infection, chronic renal disease, chronic hypertension, rheumatoid arthritis, hypertension epilepsy, Diabetes type1, Diabetes type 2, other (MoBa 2008) and is reported by doctors, midwives or women themselves. Previous health may be important. If a woman is not healthy, for instance is suffering hypertension, it could be less realistic to wish for a natural birth. On the other hand, she may wish for as natural a birth as possible even if she knows it is not possible. Data on previous health collected from the MBRN are included. Other violations of internal validity are classified into selection bias, confounding, and information bias (Rothman 2008).

Selection Bias

Nonresponse and loss to follow-up are selection biases that can introduce systematic errors in cohort studies and cause the relative risk to be over or under evaluated (Rothman, 2008). The MoBa study has a response rate of around 44 %, and there are likely socio-economic gradients in participation. The MBRN is a national birth registry based on the general population, with nearly 100% coverage. Participants were women for whom information was available from one MoBa questionnaire during week 30 of pregnancy and with birth data from the MBRN. Still, with a low participation rate, risk estimates may under certain conditions be valid and unaffected by selection bias (Rothman 2008). As for the MoBa study, studies will be made to assess the question of selection bias.

Confounding

Confounding is factors that explain or produce all or part of the difference between the

measure of an association and the measure of the effect that would be obtained with a counterfactual ideal (Rothman 2008, p. 58). This third factor must be associated with the exposure and independent of the exposure to a risk factor. The distortion introduced by a confounding factor can lead to an underestimate or overestimate of the true association between output and exposure and can even change the direction of the observed effect (Rothman 2008). Confounding can be managed during analysis if the appropriate information is available (Hellevik 2002, Ringdal 2007).

Factors that are considered to be potential confounders are:

- | | | |
|-------------------|----------------------------|--------------------|
| • Birth order | (Para 0, 1, 2+) | Papers II, III, IV |
| • Maternal age | (< 25, 25 – 34, 35+ years) | Papers II, III, IV |
| • Education | (<12, 12, >12 years) | Papers II, III, IV |
| • Previous health | | Paper IV |

Confounding was evaluated by stratified analysis and adjusted for in the unconditional logistic regression analyses (papers II and III) or log-binomial regression analyses (paper IV). To avoid assumptions of linear associations, all covariates were represented as indicator variables in the models. Mainly, adjusted results that were reported in the papers differed from the crude results.

Information Bias

Information bias is a systematic effect on the results through a systemic variation in exposure and output (Rothman 2008). There are many types of information bias, and information bias may be differential or non-differential. When misclassification with respect to one axis, exposure or outcome depends on the other axis the misclassification is differential. Alternatively, the misclassification is non-differential if one axis is independent. Non-differential information bias of outcome or exposure will tend to underestimate the effects under study, while differential information bias may exaggerate or underestimate the effects. Recall bias, a variety of differential misclassification (Rothman 2008), can result in mothers of malformed babies recalling or reporting true exposures differently than mothers of healthy babies. Most data in the present studies are based on individual reports and accessed on the

basis of the subjective opinion and experiences of the women. In our studies (II, III and IV), the conclusions of the questions with up to six choices might be an issue. Mothers possibly reporting experiences of previous childbirths differently might be another. This would lead to inflated risk estimates. To assess whether the difference within the group remained, two new dichotomized groups in the outcome variable (score of 1 – 2 versus 4 – 6) were compared. The maximum effect of this new analysis (increased OR) was found among women reporting negative birth experiences and among women who reported a belief that the women themselves should decide whether or not to have a cesarean section. The response rate for the study as a whole was low (44 %). The response rate for individual questions (Studies II, III and IV) was high, however (92-98%), and the high response rate and low number of dropouts counteracted this (Hellevik 2002, Ringdal 2007).

An important aspect of information bias is misclassification and ascertainment of an output (Rothman 2008). The data were collected with the help of a structured questionnaire described in the MoBa Protocol (FHI 2005). The validity applies to the group under study. A large number of the questions in the MoBa do not seem to be valid. The face validity and content validity are therefore uncertain. Nonetheless, from an academic perspective, the research questions seem to be relevant in relationship to this target group. On a scale from 1 to 6, the women were supposed to choose from “completely agree” to “completely disagree” on the statement “I want to give birth as naturally as possible without painkillers or intervention”, covering three given areas that are not explicitly defined ("natural", "pain relieving", and "intervention"). We do not know how the women interpreted these concepts whether an answer reflects the interpretation for every area or whether the women only responded to one or two of the concepts. Therefore, we do not actually know what has been answered. It is reasonable to think that some women are most concerned with a natural birth, and it is therefore natural for them to receive a pain-relieving epidural. Some women may feel that relieving pain includes epidural and medicinal treatment, while other women may include acupuncture, sterile water papules, nitrous oxide or a pudental nerve block. Neither do we know how women interpret the word intervention; for some this can mean a cesarean section, while for others this can include suction cups and forceps, maturation, medicinal stimulation of contractions, an episiotomy or shaving. Still, we may assume that all the women who have said that they agree with the statement “birth as naturally as possible without painkillers or intervention” are more positive to all the elements in the statement than those who disagree.

Precision

Random or unsystematic variations as opposed to systematic variations have many components. The statistical information or precision in a measurement or process is often taken to be the inverse of the variance of measurements or estimates that the process produces (Rothman 2008). The concept of an error can encompass unsystematic measurement errors, sampling errors and biological variations. Precision is in this sense the opposite of random error; high precision means a lack of random error. Precision of estimation can be improved by increasing the size of the study group. This aspect must be taken into consideration in our study due to the size (nearly 56,000 respondents) and treating pregnant women as a homogenous group.

Multiple testing is an aspect of precision. A large number of significance tests might sometimes be difficult to interpret, because if testing goes on long enough, something significant will inevitably be found (Rothman 2008). Precision evaluation is linked to power calculations that can be made to decide how many women are needed to detect a given statistically significant difference between two groups (Rothman 2008).

A number of methods to adjust for multiple testing have been described and debated. Bonferroni correction is one such technique (Rothman 2008). In our study the use of this test or similar methods would mean that we would have had to specify how many tests we would perform in advance. Given the limited amount of knowledge about the associations between a desire for a mode of delivery and selected predictors, and therefore the lack of a specific hypothesis to test, this was not considered an appropriate method in our study.

The analysis of data was performed as thoroughly as possible and we have described which tests of significance we used. A question or an instrument that measures what was intended reduces the risk of an error. Many of the questions in the MoBa study have been used before and were specifically chosen for this study (MBRN 2008). Estimated by Chronbach's alpha, the scales showed high internal consistency. Still, some of the questions in the scale that related to psychosocial factors (Leganger 2000, Strand 2003, Izard 1993, Vittersø 1998) may have overlapped each other.

External Validity

Generalizability or external validity refers to whether the results and conclusions of a study can be relevant for other populations than those being studied: to achieve this quality, the internal quality must be strong (Polit & Hungler 1999, Hellevik 2002). The present work is based on data from the MoBa cohort study, which is conducted on a national basis and is linked to data in the MBRN. The present work show difference in background characteristics, exposures and outcomes between MoBa participants and the total population (Nilsen 2009). Exposures and outcomes between MoBa participants and the total population agree with results found in other pregnancy-related studies (Nohr et al. 2006, Richiardi et al. 2007).

Norway has a well-functioning health care and social welfare system and the population of 4.79 million inhabitants (www.ssb.no/befolkning/ 2008) is fairly homogenous. Thus, the socio-economic and geographical factors exert less influence on morbidity and mortality than in other countries. The response rate in the MoBa study was around 44 %. Large numbers can never compensate for a low response rate. The danger is that those who respond will not represent the whole target population. It is especially important not to place too much emphasis on small differences even if they are found to be statistically significant in this selected although large population. In addition, what is statistically significant may not be clinically significant at all, and those who responded were in some ways (Table 1) different from the whole population.

We do not know why so many women did not wish to participate in the study. The extent and volume of the questionnaire might be one reason (Hellevik 2002, Ringdal 2007). The aim of MoBa was not to test any single hypothesis or even any set of hypotheses (MoBa 2008). The objective was to test specific aetiological hypotheses by estimating the association between exposures and diseases for mothers and children, with the aim being the prevention of such diseases. For our analyses, self-reported information from the pregnant women is based on data from the MoBa questionnaire that was filled in at the 30th week of pregnancy. We do not know anything about underlying implications regarding each answer, such as with respect to the birth experience, and we do not know what happened after the 30th week of pregnancy.

The questions in the questionnaire were not specially designed to study the characteristics of women who wanted a specific mode of delivery. Furthermore the statement "as natural a birth as possible without painkillers" does not have any evident definition. There were no guidelines in the questionnaire for how to respond making it certain that all women

understood the question in the same way. Women may understand the main question in a different way depending on their background. We do not know if they answer according to their idealistic wishes or on the basis of what is realistic. We do not know if the woman says what she would like in the ideal world, i.e. according to wishes if everything was ideal, or from practical point of view, i.e. what options are in fact open to her.

Strengths and Limitations

Strengths of the present study are its size, the fact that exposure data were collected prospectively and in a fairly homogeneous population, and that the data on exposures and health variables were of good quality. Nearly 100 % of the pregnant women in Norway make use of public antenatal care, and all women who are booked for public antenatal care are invited to take part in the Mother and Child study, and, while the participation rate for the study as a whole was low (Hellevik 2002, Ringdal, 2007), the response rate for the individual questions (Studies II, III and IV) was high. Although a limited number of hospitals were initially included in the MoBa, the participating hospitals represent different parts of the country and are located in both urban and rural areas. Thus far, Roy Nilsen et al. (2008) have made the only assessment of generalizability of the MoBa cohort. The most important limitations are the low participation rate and a strong underrepresentation in MoBa of women younger than 25 years of age, mothers with more than two previous births, smokers and women with previous stillbirth(s), while multivitamin and folic acid supplement users were overrepresented (Nilsen 2008). MoBa participants did not differ from the total population regarding medical diagnosis before the present pregnancy.

Three of the present studies are based on individually reported data, and all factors were assessed on the subjective experiences of the women. For some of these factors, such as the desire for a given mode of delivery during week 30 of a pregnancy, birth experiences, attitudes related to childbirth, and intra-psychic phenomena, the only way of getting the information is through individual reports, because these concepts are defined as subjective experiences. The design of the present research project is partly cohort (follow-up) and partly a cross sectional design. In a cross sectional design, where information on possible predictors as well as outcomes is collected at the same time, a limitation regarding the interpretation of findings is that the direction of the associations cannot be decided.

Implications for Further Research

As a general rule, associations found in a study such as ours should be verified in later studies. The questions in the questionnaire were not specially designed to study the characteristics of women who want or who do not want natural birth. Definition of natural birth is important here. Vaginal birth is not the same as natural birth without pain relief, and the various variables in the study may be associated with the wish for vaginal birth and the use of painkillers in a very different way. Women may have understood and interpreted main questions in totally different ways. There were no guidelines in the questionnaire as to how to respond making it certain that all women understood the question in the same way. A qualitative study asking the mothers-to-be about how they would prefer to give birth may give information. In the MoBa study, 100,000 pregnant women are recruited to take part in a follow-up that may last for many years after childbirth, as are their babies. Information about outcomes, for mothers and children, may be studied in an attempt to find information about potential causal factors related to how women give birth.

IMPLICATIONS FOR PRACTICE AND CONCLUSION

An investigation of women's attitudes to childbirth is an interesting topic in the light of ongoing discussions of caesarean section on maternal request and the theme is considered of interest to those working clinically and scientifically in this field. For those who care for women in pregnancy and labor it is also of interest to know why some women do not want natural birth. Better insight may help in giving women more satisfying care.

The medicalization of reproduction is often criticized because it creates dependency on the medical system and infringes on the autonomy of pregnant women. De-medicalization should be aimed at considering pregnancy as a physiological event rather than a disease – in other words, birth should not be regarded a priori as a problem, and newborns should not be considered patients. However, a critical approach to de-medicalization should be adopted, and safe de-medicalization should ensure that skilled professionals are always available at each level of care during pregnancy, at birth and after birth. A newly fledged mother who feels empowered regardless of whether her wish for mode of delivery is fulfilled, is of importance in public health.

Even though we found that a preference for a method of birth was associated with how a woman actually delivers, we do not have the evidence to claim that the women in the study delivered in the manner they preferred. The factors that influence the chance of having a natural birth are different for primiparas and multiparas. The high rate of non-natural births among first-time mothers who actually want to have a vaginal birth without interventions should call attention to the increasing incidence of cesarean sections in Norway. The chance of actually having a natural birth for women with a preference for a natural birth is much larger for multiparas. Negative experiences from previous pregnancies and cesarean section are, however, important factors associated with non-natural birth and should be taken into consideration.

Asking women about their preferences regarding the mode of delivery in pregnancy may increase the opportunity to provide adequate support. This may increase the rate of optimal deliveries: vaginal births and/or cesarean sections.

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