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The (Un)informed Patient: A Comparative Study of Anxiety and Sense of Control in Primary and Secondary Caesarean Sections

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Abstract

Objective: Unplanned Caesarean section (CS) constitutes a very stressful event, and is associated with traumatic birth experience. Especially feelings of helplessness, poor information and communication are reported as distressing factors in unplanned Caesarean birth. Addressing these stressors by offering timely patient education and counselling, might be a way to improve sense of control and reduce anxiety. This study compared anxiety and sense of control between women who had a planned caesarean section (PCS) and patients who had an unplanned/secondary caesarean section (SCS).

Methods: The sample consisted of 129 women (PCS=66; SCS=63). It was hypothesized that the PCS group benefitted more from patient education than the SCS group leading to lower levels of anxiety and a higher sense of control. Possible confounding factors were controlled for (example, previous child birth experiences and the patient's locus of control). Anxiety and sense of control were measured by Visual Analogue Scales intraoperatively and one day postoperatively. The Control Preferences Scale and the Multidimensional Health Locus of Control assessed the discrepancy between desired - perceived control and the locus of control, respectively. By means of a checklist it was registered whether subjects had an adequate comprehension of the patient education provided. Multiple regression analyses were used to analyze the data.

Results: Intraoperative sense of control during SCS was scored significantly lower as compared to PCS. A higher sense of control was associated with significantly lower anxiety scores in both groups. Furthermore, a more internal locus of control was related to a greater discrepancy between desired and perceived control.

Additional patient education in the PCS condition seemed to increase the sense of control.

Conclusion: Patient education about the Caesarean procedure might benefit the psychological well-being of the mothers as it lowers anxiety scores indirectly via a heightened sense of control.

Keywords: Caesarean section; Anxiety; Multiple regression; Patient education

Introduction

In the Netherlands low-risk women may choose whether to give birth at home or in a hospital (outpatient clinic). This free choice for place of birth is almost unique in the (western) world and is an important pillar of the Dutch maternity system. Professional practice standards strive to create a childbirth experience that is safe for the mother and the baby and positive and satisfying for the childbearing woman. However, physical and psychological problems after complicated childbirth are common, and may, partly depending on mode of childbirth, have a negative and long-term impact on women's wellbeing and daily functioning. Factors like pain in first stage of labor, feelings of powerlessness, and intrusive emergency obstetric interventions are important in the development of birth trauma [1]. Especially, a Caesarean section (CS), more often than a vaginal birth, is associated with a traumatic birth experience, and can lead to an increased risk of postpartum depression and Post-Traumatic Stress Disorder (PTSD) [2,3]. A Caesarean section is often performed when a vaginal delivery would put the baby's or mother's life or health at risk. However, part of the CSs are also performed upon request of the mother without a valid medical reason (example, fear of child birth). The World Health Organization (WHO) has declared a target maximum of 10 to 15 per cent for CS childbirth [4]. While worldwide numbers of CS still exceed this

target figure (up to 46%) [5], the Netherlands Perinatal Registry reports consistent annual statistics of about 16% within the Netherlands. A CS can be planned (in other words elective or primary, PCS) or unplanned (in other words urgent or secondary, SCS), leaving no time for childbirth/CS education. According to the Dutch perinatal registration, slightly more than half of the CS (54%) are unplanned [6].

Women experiencing SCS may on the one hand feel more frightened, helpless, and overwhelmed and on the other hand may be less likely to feel capable, confident, powerful, and unafraid while giving birth compared to PCS or vaginal birth [7]. Women reported poor information and poor communication as especially distressing factors in association with caesarean birth [8]. The perceived sense of control during childbirth seems to play an essential role in this respect. The importance of choice and control was often talked about in a qualitative study that explored first-time mothers' experiences of birth [9]. One study participant experiencing her first birth (at the hospital) describes being 'relaxed while ever I was in control'. Later she describes losing control as 'venturing into the unknown'. Loss of personal autonomy and control during labor and birth can cause distress to women giving birth. Preparation for birth needs to enhance the woman's sense of confidence, by providing accurate and realistic information that will enable her to make informed choices and decisions, and enable her to feel in control of her labor and birth [9,10].

In case a woman in labor experiences anxiety and loss of control, negative consequences may emerge. Previous studies have shown that women who give birth by a CS show adverse emotional affect like anxiety and postpartum depression [2]. More specifically, an urgent CS increases the risk for postnatal depression by six fold compared to spontaneous vaginal birth. In a published cohort study almost 73% of the women giving birth by unplanned CS developed acute trauma symptoms. Moreover, almost one third of all women who met the criteria for PTSD 4-6 weeks postpartum, gave birth by (an unplanned) secondary CS [2]. It is this high-risk group that particularly receives little preoperative information, while it is known that patient education creates positive expectations and enhances feelings of support [11]. Planned (primary) caesarean involves major surgery as well and is associated with specific expectations and fears [12], improvement is possible by providing more detailed information to the prospective mothers and by specifically addressing prevalent anxieties [13].

Former literature has suggested that a positive perception of childbirth, including satisfaction with the experience and care, is promoted by prenatal education [14]. Childbirth education influences enabling factors in the birth experience by: feeling prepared; knowing what to expect; practicing; knowing the procedures; and the freedom to ask questions and receive explanations [15]. Furthermore, well informed patients may benefit from an increased sense of control [5,16]. While a feeling of helplessness during CS surgery may have a negative influence on the birth experience, a sense of control has proven to be positively associated with increased emotional well-being, increased sense of power and self-

esteem, lower levels of anxiety, less depressive symptoms and fewer symptoms of postpartum PTSD [17].

The present study hypothesized that the PCS group benefits more from patient education and counseling than the SCS group leading to lower levels of anxiety and a higher sense of control. The Triad of Control Model by Blank, Levesque and Winter [18] as well as the Locus of Control Theory [19] were used as a theoretical basis for these hypotheses. The triad by Blank et al. distinguishes a Perceived Control (PC), a Desired Control (DC) and an Actual Control (AC). PC is the cognitive interpretation that someone has of their own personal potential to achieve certain outcomes. DC is the desired control which controls the behavior motivation. AC is the actual control at the moment of measurement [18]. The triad indicates that in ideal conditions, the three concepts, and thus the person herself, are in balance. Knowledge, as acquired by patient education, increases the sense of control and may ultimately reduce anxiety [7]. How a laboring woman perceives the loss of control as induced by a CS depends, besides on being well informed, on the personal locus of control. Patients with a more internal locus of control tend to have a strong belief in their own abilities and want to maintain as much self-determination (autonomous decision making) as possible, while patients with a more external locus are less reluctant to relinquish control [19]. In this study, both locus of control and the associated discrepancy between DC and PC are studied in relation to levels of anxiety in PCS and SCS patients. Based on the theoretical model, patient education, locus of control as well as the associated discrepancy between DC and PC are hypothesized to determine an eventual psychological aftermath post CS, naturally taking into account previous childbirth experiences and background characteristics. Former birth experience is associated with antenatal fear of childbirth [20,21] and mode of delivery [21-23].

Methods

Procedures

This study took place at the largest top clinical teaching Hospital of the Netherlands, Isala, Zwolle. Within the study period from October 2010 until March 2011 276 CSs took place. Women who had a Caesarean section, aged over 18 years, who had regional (spinal or epidural) anesthesia and were fluent in Dutch (speaking, reading and writing) were included in this study. Patients operated under general anesthesia were excluded as well as cases of neonatal death.

The procedure was defined as a planned or primary Caesarean section (PCS) in case a Caesarean was considered to be necessary before pregnancy (example, medical history, two or more previous CS) or when it became apparent during pregnancy (example, placenta previa, breech presentation after counseling the mode of delivery). An unplanned or secondary CS (SCS) referred to those cases where it became clear during labor that a Caesarean section was necessary. The most common reasons for a SCS are poor progression of labor or fetal distress. The group of patients who gave birth during

an emergency CS (ECS) were disregarded due to ethical reasons, the event by itself is exceptionally traumatic.

This quasi-experimental study used a post-test only design. However, the research variables anxiety and sense of control were measured at two moments in time: intraoperatively and one day postoperatively. The intraoperative measurement took place when the newborn mother was just transferred from the operating-room to the recovery.

The independent variable concerned patient information as given by the health professionals in the PCS group. This childbirth/SC education provided information about the medical procedure, the course of events, the necessary preparations before CS, the different methods of pain relief in labor, what to expect after CS, and possible complications of CS. This information was given by verbal communication during visits to the gynecologist, during the preoperative screening by the anesthetist, during the Obstetric Nurse Consultation also known as VSO (Verpleegkundig Spreekuur Obstetrie), and during admission to the hospital by a nurse. Additionally, PCS patients were given written information by information brochures (i.e., 'Caesarean Section' and (if applicable) the brochure 'Breech presentation').

The control group included the SCS group who did not receive this comprehensive patient information. The only written information they got was the hospital admission leaflet which was also available for the PCS group. Both groups could voluntarily visit an information meeting. During this information evening, a gynecologist and a nurse presented the common course of events of childbirth at the hospital and were available for questions. Afterwards, one could visit the delivery room. Random allocation to the treatment conditions was impossible, but a natural selection divided the participants nearly equally over the two groups by the prenatal circumstances (example, breech or transverse position) or by birth complications (example, fetal distress).

Data were analyzed with multiple regression analyses. Confounding variables were controlled for included previous vaginal births, former Caesarean sections and premonitory psychological functioning.

In accordance with the Explanatory Statement of the Personal Data Protection Act (WBP), the study participants had to give explicit consent by signing an Informed Consent. The study was carried out in accordance with American Psychological Association's Ethics Code and the Declaration of Helsinki, 2013. The Medical Ethics Committee of the Isala and the Central Committee on Research involving Humans (CCMO) judged that the study complied with the Dutch law on Medical Research in Humans (WMO, 06-07-2010).

During recruitment it was emphasized that participation was voluntary, that there were no risks in participating and that the results may contribute to better future care for mothers and infants. Women were informed that their information would

remain confidential and that there would be no way of identifying them.

Measurements

A written structured questionnaire was handed out to study participants who had signed an informed Consent. The measurements were based on existing valid and reliable questionnaires and registrations of specific computer programs used at Isala: MOSOS (Monitoring and Storage of Obstetric Signals), Izis (Isala Hospital Information System) and MCC (Medical Control Center).

Anxiety was assessed intra- and postoperatively using a Visual Analogue Scale (VAS). Sense of Control (DC-PC) was measured postoperatively by the Control Preferences Scale (CPS) [24] in addition to an intra- and postoperative Visual Analogue Scale (VAS). The Internal health locus of control (IHLC) subscale of the Multidimensional Health Locus of Control questionnaire (MHLC) [25], form A was used to identify the Locus of Control. Internal health locus of control (IHLC) refers to an individual's belief that her health is dependent upon her own behavior.

All (sub) scales showed acceptable to satisfactory inter-item correlations (Cronbach's alpha >0.60).

The mode of delivery (PCS versus SCS) was traced back using the intention to treat analysis from the Obstetrics Information System MOSOS. To illustrate; In case a planned Caesarean (PCS) became a SCS, this patient was analyzed as a PCS. This group of patients had standard patient education about the CS, and was informed by the gynecologist, the anesthetist and received brochures during the Obstetric Consultations. In case of a CS that was initially planned to be a vaginal birth, the mode of delivery was registered as SCS. Previous vaginal births, former Caesarean sections and premonitory psychological functioning were also checked for by MOSOS.

Childbirth/SC education was measured using a checklist. Each patient was asked to indicate the degree to which she had been informed about the CS, if the information/communication was comprehensive, and if she knew (having received the information) what was going to happen. Moreover, the women could state their preferred educator/channel of communication: the appointments with the gynecologist, the preoperative screening by the anesthetist, the Obstetric Nurse Consultation, the talk with the nurse at the hospital admission or the written information brochures. Furthermore, they were asked which information was most valuable to them.

Results

A total of 129 patients (response rate 47%) participated in the study. The average age of respondents was 31.5 years (SD=4.94), the youngest respondent was 21 years old and the oldest 46 years. They were divided into two groups, the group

of PCS-patients (n=66) and the group of SCS-patients (n=63) (Table 1).

Table 1 Background characteristics PCS group versus SCS group. Legend: **p<0.01.

	PCS (n=66)	SCS (n=63)
	Mean (SD) or N	Mean (SD) or N
Age	31.9 (5.5)	31.2 (4.3)
Primipara/Multipara	22/44	43/20**
Previous vaginal birth	24	10**
Previous SC	27	12**

The PCS women showed more previous birth experiences (vaginal as well as SC) compared to the secondary SC group. The numbers in "primipara" (first pregnancy) and "multiparous" (a subsequent pregnancy) include previous spontaneous abortions. Hence, the sum of these numbers does not equal the amount of previous birth experiences.

Table 2 represents the anxiety and control scores in both groups as measured by the VAS (range 0 (not at all anxious/no control) to 10 (extremely anxious/full control)). Anxiety did not

differ between PCS (3.5 ± 2.7) and SCS (3.4 ± 2.9) intraoperatively. Whereas intraoperative perceived control was rated significantly higher in the PCS group (4.7 ± 3.4 versus 2.7 ± 2.9), which was confirmed by the regression-analysis ($\beta=-0.29$, $p<0.01$). The PCS as well as SCS group showed decreased anxiety scores postoperatively (1.3 ± 1.6 and 1.5 ± 2.0 , respectively) and increased perceived control (PCS 5.5 ± 3.3 versus SCS 5.2 ± 3.2), postoperative scores did not differ between the two groups.

Table 2 Intra- and postoperative scores Anxiety (VAS) and Perceived Control (VAS and DC-PC) comparing 'PCS' and 'SCS' group. Legend: **p<0.01.

	PCS (n=66)	SCS (n=63)	p-value
	Mean (SD)	Mean (SD)	
VAS intra-operative anxiety	3.52 (2.69)	3.42 (2.91)	0.27
VAS postoperative anxiety	1.31 (1.63)	1.53 (2.04)	0.12
VAS intra-operative perceived control	4.68 (3.43)	2.71 (2.91)	0.02**
VAS postoperative perceived control	5.53 (3.25)	5.22 (3.19)	0.84
PC-DC	-0.15 (1.03)	-0.82 (1.09)	0.001**

The internal locus of control of the study participants ranged from 11 to 30 (theoretical range 6 to 36). The internal locus of control scored similar in the PCS (19.8 ± 4.5) and SCS (19.1 ± 3.8) group. Accumulating the data of both groups, a significant association was found between a higher internal locus of control and a greater discrepancy between desired and perceived control during surgery ($r=0.217$, $p=0.02$).

Furthermore, results of the stepwise regression analyses showed that patients with a higher perceived control scored lower on anxiety during surgery as compared to patients with a lower perceived control ($\beta=-0.23$, $p=0.01$). This protective effect of intraoperative perceived control on anxiety persisted postoperatively ($\beta=0.22$, $p=0.01$). The condition (PCS versus SCS) and previous experiences of childbirth had a significant protective main effect on postoperative anxiety ($\Delta R^2=0.06$; $p<0.05$) and on intraoperative perceived control ($\Delta R^2=0.27$; $p<0.01$). The hypothesized interaction effects of both condition and previous childbirth could not be confirmed. The influence of condition on peroperative perceived control was

confirmed by the group differences in self-reports according to the checklist patient education ($t=-3,818$, $p<0.01$). According to the self-reports, the PCS group benefitted more from the CS education as compared to the SCS group ($c2(2, N=117)=31.25$, $p<0.01$). The information on CS was regarded as comprehensible by 94% of the respondents. The additional value of patient education by the nurse was obvious in the PCS group, who declared the patient education during the VSO and admission to the hospital as most valuable while the SCS group most valued the information as given by the gynecologist.

Discussion

There are many complex variables that influence women's perceptions of their birth experiences including personal factors and conditions during childbirth [26]. Women experiencing SCS may feel more overwhelmed and less in control compared to PCS or vaginal birth [7]. This study confirmed this difference in planned and unplanned CS and emphasized the relevance of the perceived sense of control

during CS. It is well known that adults learn best when they perceive the information to be relevant and easily used in the immediate present. Because about half of the CSs are unplanned, this makes it hard to inform women who need a CS at the most optimal time. Obstetric Consultation by nurses, known as Verpleegkundig Spreekuur Obstetrie in Isala, was the most highly appreciated form of CS education as stated by the PCS group and could be of use for all expecting women. Even in case of a planned vaginal birth, it's important to prepare for the unexpected. In case of an unplanned CS, the health care provider might not have time to explain the procedure or answer questions in detail. Therefore, it is recommended to offer the possibility of discussing a CS with the health care provider well before due date. The possibility of asking questions, sharing concerns and reviewing the circumstances that might make a CS the best option, enhances sense of control and lowers anxiety.

The relationship between patient education and reduced anxiety seemed to be (partly) mediated by a greater sense of control. This finding underpins the results as presented by Yildirim et al. [11]. In this study it was determined that the knowledge scores about Caesarean section increased significantly after they were informed, but that the soon-to-become mothers' anxiety scores decreased very little after they were informed. Further research involving multiple measurements and a larger sample (preferred multicenter) is recommended to clarify this underlying psychological mechanism. Quasi-experiments are subject to concerns regarding internal validity, because the treatment and control groups may not be comparable at baseline. Therefore, differences between groups on both observed and unobserved characteristics could be related to treatment (example, complications during pregnancy). Due to the specific ad hoc situation of a CS, a baseline measurement was impossible. Although this quasi-experimental study may not convincingly demonstrate a causal link between the treatment condition (planned versus unplanned CS) and observed outcomes, possible confounders were controlled for, such as the moderating effect of previous childbirth, previous Caesarean section and pre-morbid psychological situation.

Due to differing health care systems across countries and varying childbirth philosophies the external validity of this unicenter study is limited. The data derive from within a culture in which most women prefer vaginal birth and do not often ask for a Caesarean section themselves, unlike some other countries. This may influence their perceptions and evaluations. Moreover, the study sample was relatively small and homogeneous in terms of age, education and marital status. With respect to the internal validity, the two groups PCS and SCS did not differ regarding previous birth experiences (vaginal or Caesarean) nor preoperative psychological functioning.

The Multidimensional Locus of Control originally consists of three dimensions: Internal health locus of control (IHLC) referring to an individual's belief that her health is dependent upon her own behavior; chance locus of control (CHLC) representing the belief that chance factors determine health

outcomes; and powerful others locus of control (PHLC) referring to an individual's belief that her health is dependent upon the behaviors of powerful others such as medical doctors. This study only measured the subscale Internal health locus of control. Including all three dimensions could have made a better distinction between women who wish to stay in control versus those women who would rather pass it over to the gynecologist. Furthermore, educational needs may differ between these 'high internals' and 'low internals'. However, ethical and practical considerations limited the size of the questionnaire to not overburden the women in this already very stressful moment in their lives.

This study as well as a literature review emphasize the need for childbirth education and more specifically CS education. Besides perceiving more control, educated women may benefit more from the perception of being well cared for (example, more positive perception of childbirth), adaptive coping strategies (example, reduced anxiety), a reduction of pain medication, and higher self-actualization [27]. Furthermore, health education can help preventing complications and promote healthy lifestyle factors, thereby enabling self-care. Keep the patient informed, and it may even increase the choice of natural delivery keeping the numbers of CS on request down.

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Declaration of Interest Statement

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