The "Natural" Cesarean: An Online Survey of Israeli Women's Attitudes

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Abstract: The "natural" cesarean is an elective cesarean technique, which attempts to mirror the normal physiology of the vaginal birth process and the immediate period after birth, conceptualized in the early 2000s and gaining popularity. Women who have no choice but to undergo an elective cesarean section, their babies, and spouses can all benefit from this procedure. Although previous studies examined women's attitudes towards cesarean delivery, women's attitudes towards the "natural" cesarean have not been studied. The purpose of this study was to assess Israeli women's attitudes toward the technique via an online survey and map obstetric departments with its practice.

Keywords: cesarean birth, quantitative research, birth

The "natural" cesarean (NC) is an elective (planned) cesarean (EC) delivery technique for healthy women with a non-compromised singleton fetus at term (breech presentations not included) which was conceptualized and implemented in England in the early 2000s. This

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technique attempts to mirror the normal physiology of the vaginal birth process and the immediate period after birth by facilitating parental active participation, slow delivery of the baby with physiological autoresuscitation, and early skin-to-skin contact with the mother (Smith, Plaat & Fisk, 2008). The NC has evolved in a climate of worldwide steadily-increasing cesarean delivery rates (Betrán et al., 2016) during which the negative implications of cesarean delivery on both mother and baby are well documented (Al Khalaf, et al., 2015; DiMatteo, Morton, Lepper, & Damush, 1996; Gregory, Jackson, Korst, & Fridman, 2012; Kelmanson, 2013; Lobel & DeLuca, 2007; Netz, 2014; Shapira, 2017; Sirvinskiene, Zemaitiene, Jusiene, & Markuniene, 2016; Xie, Gaudet, Krewski, Graham, & Walker, 2015).

Since its conceptualization, there have been several positive and satisfactory reports on the implementation of the NC technique in the United States (Camann & Barbieri, 2013; Magee, Battle, Morton, & Nothnagle, 2014; Schorn, Moore, Spetalnick, & Morad, 2015; Tumblin, 2013), England (Simmonds, 2016; Smith et al., 2008), Germany (Armbrust, Hinkson, von Weizsacker, & Henrich, 2016), the Netherlands (Posthuma & Korteweg, 2017), and Australia (Dowling, 2007). The technique has been filmed and narrated (Smith, 2012) and is freely accessed online (Wiseman, 2012). Although it is becoming more familiar, and delivery room equipment such as clear surgical drapes have been implemented to both prevent contamination and enhance visibility (Camann & Trainor, 2012), it is far from becoming standard procedure when an elective cesarean delivery is advised. The contradictory use of the word "natural" in conjunction with a cesarean delivery has generated some discussion (Douché, 2009) and criticism (Newman & Hancock, 2009). Apparently, many women are put off by the idea and do not want to be active participants during the delivery (Dowling, 2007) and midwives are often unenthusiastic about it (Lara, 2013). Furthermore, currently neither the World Health Organization (WHO) nor the American College of Obstetricians and Gynecologists (ACOG) have a formal policy regarding the NC.

The global rise in cesarean delivery rates is evident in Israel, where a moderate increase has been recorded: from 17% in 2001 to 18.3% in 2017 (Manny, 2018). Of the 27 obstetric departments in the country, only two (Emek medical center, n.d.; Meir medical center, n.d.) state on their website that they practice the NC technique. However, there is unofficial information (Rotem, 2016) suggesting that additional obstetric departments already have or are preparing to implement the NC technique. Although there have been studies that examined women's attitudes towards cesarean delivery (Fawcett, Aber, Haussler, & Weiss, 2011; Litorp, Mgaya, Kidanto, Johnsdotter, & Essén, 2015; Pevzner, Preslicka, & Bush, 2011), women's attitudes towards the NC have not been reported. The objective of this study was twofold: first, to examine

Israeli women's attitudes toward the technique, and second, to ascertain how widespread the use of the technique was in Israel.

Methods

Design

Attitude toward the NC was determined by responses to an anonymous online survey questionnaire devised for women who had previously delivered via an EC. Obstetric departments were contacted directly by email to ascertain whether or not they practiced the NC technique and if they did, for how long. The email message included a link to the NC YouTube film (Wiseman, 2012) and referenced the original article (Smith et al., 2008) delineating the technique. If replies were not received by email, response was obtained by a phone call to the obstetric department.

The study was conducted between May 8th, 2017, and June 13th, 2017 after obtaining ethical approval from the Zefat academic college ethics committee. The researchers posted a message about the study and their search for participants in various online forums and Facebook groups for mothers, after obtaining consent from the forum/group administrator. The message invited the targeted audience to contact the researchers either via private message or via email. Upon receiving the request, a link to the online survey was sent to the participant.

Instrument

A structured questionnaire was created in Hebrew utilizing Google Forms. It consists of four sections:

- First section: The trial consent form, which explains the study aim, participation requirements, response confidentiality, and a statement regarding the possibility of the production of negative memories from one's previous birth(s) which might be generated as a result of participating in the survey. Therefore, contact information of appropriate support options was provided if this were to occur.
- Second section: A short introduction in plain language about the NC and its principles and a link to the 12-minute NC film on YouTube (Wiseman, 2012) to which Hebrew subtitles were added.
- Third section: Two groups of questions on the participant's age and obstetric history (number and type of births by order, date of most recent EC, reason for EC, and attitudes and familiarity with the NC, if and how did the participant hear about NC, would she have chosen the technique had it been possible now that she has watched the

movie and read the information, would her spouse have wanted her to have a NC if it was an option). This section also included unstructured portions to enable a written response if elaboration was needed. Participants could explain why they/their spouse would/would not have wanted a NC.

The question regarding the participant's familiarity with the NC technique had an additional choice of response for participants who had had a NC. They were asked to grade their satisfaction with the procedure on a five-point Likert scale (1. dissatisfied 2. slightly satisfied, 3. moderately satisfied, 4. very satisfied, 5. extremely satisfied), and if they would have chosen it again. In cases where the participant had both a NC and a regular EC they were asked to compare their satisfaction with both procedures (1. more satisfied by the regular EC than by the NC, 2. equally satisfied by both procedures, 3. more satisfied by the NC than by the regular EC).

– Fourth section; Socio-demographic information (marital status, religion and religiosity, level of income, and education level).

Main Outcome Measures

The main outcome measure for women who had never had a NC (whether or not they had heard about it previously), was their willingness to have had a NC if it were possible and their reason. The main outcome measure for women who had had a NC was their satisfaction with the procedure. The main outcome measure for women who had both a regular EC and a NC was their preference of one over the other.

Data Analysis

Statistical analysis was performed using SPSS, Version 22.0 (IBM Corp., 2013). A descriptive statistics analysis, correlations, and between groups comparisons (independent t-test) were conducted to find differences between groups (for example: women who heard about the NC vs. women who had not heard about it). The content of the unstructured portions of the questionnaire in which participants elaborated on the reasons why they and their partners would/would not have wanted a NC in retrospect were grouped by content similarity to demonstrate the most common responses.

Findings

A total of 311 women filled in the questionnaire. Three women were excluded because they had previously undergone an emergency cesarean section rather than an EC and two others were excluded because they

did not watch the film as required on section two of the questionnaire. A total of 306 participants were included in the final analysis**.**

Sociodemographic Information and Indication for Previous Elective Cesarean

Mean maternal age of the participants when filling out the questionnaire was 35.8 years (SD +/- 6.7), the age range was 20-63, and 87.2% of the couples were married or in a relationship with a mean marital period of 9.9 years (SD +/- 6.8). Table 1 shows the demographic characteristics of the cohort. All but three respondents indicated the reason for undergoing an EC (table 2). A previous cesarean section (43.9%) and breech presentation (21.1%) were the most prevalent reasons mentioned.

Table 1.
Cohort Demographic Characteristics

Variable	No.	%
Marital status		
Married / In a Relationship	280	92.1
Single	11	3.6
Divorced	12	3.9
Widowed	1	0.3
Religion		
Jewish	294	97
Christian	4	1.3
Other	5	1.7
Religiosity		
Secular	202	67.1
Traditional	66	21.9
Religious	33	11
Socioeconomic status		
Below median family income	80	26.7
Median family income	69	23
Above median family income	151	50.3

Education		
Elementary school education	3	1
High school education	68	22.4
Academic education	199	65.5
Professional education	34	11.2

Some demographic variables were not reported completely.

Table 2.
Reason for Previous Elective Cesarean Section

Reason	No. n=306	%
Former cesarean section	133	43.9
Breech presentation	64	21.1
Cesarean delivery on maternal request (CMDR)	30	9.9
No medical reason	3	1
Fear of vaginal childbirth	13	4.3
Former traumatic vaginal birth or cesarean section	14	4.6
Mother's medical condition	23	7.6
Twin pregnancy	14	4.6
Placenta Previa	9	3
Pelvic floor or anal sphincter injury in a previous delivery	9	3
Big or small baby	4	1.3
Cephalopelvic disproportion	7	2.3
By doctor's recommendation	3	1
Uterine septum	3	1
Shoulder dystocia in a previous delivery	3	1
Uterine myoma	1	0.3

Some reasons were not reported completely.

Familiarity with the "Natural" Cesarean

Over half of the participants (167, 54.5%) had previously heard about the NC technique, of which 31 (10.2%) had undergone one, while 137 women (45.07%) had never heard about it (figure 1). Most of the women who had heard about the NC learned about it online - either through Facebook (58.6%), the Internet in general (27.8%) or on YouTube (0.8%), while others had heard about it from either a childbirth professional or their chosen obstetric department (9.9%) or a friend (2.3%).

A t-test for independent samples was conducted to examine for differences between the women who had previously heard about the NC and those who had not. A statistically significant difference was found in participant age: the mean age for women who had heard about the technique was lower than the mean age for women who had not. No difference was found between the groups in number of education years (table 3). Correlations between demographic and childbirth-related variables and participant prior familiarity with the procedure were conducted using chi-square tests. A statistically significant weak correlation was found between participant education type and previous familiarity with the procedure ($\chi^2(6)=21.07$, $r_c=0.19$, $P<0.01$). A larger proportion of participants with academic education were familiar with the procedure than participants with either elementary, high school, or professional education. No correlations were found between participant familiarity with the procedure and parity ($\chi^2(2)=4.816$, $P=0.09$), indication for EC ($\chi^2(2)=4.47$, $P=0.107$), religiousness ($\chi^2(4)=3.637$, $P=0.457$), or socioeconomic status ($\chi^2(4)=8.563$, $P=0.073$).

Table 3.

Means and standard deviations for independent t-test results by group - prior familiarity and retrospective interest with the 'natural' cesarean

		N	Mean	SD	Df	t	P-value*
Age					229.651	3.992*	<0.01
	Heard about the procedure	166	34.4	7.83			
	Had not heard about the procedure	137	37.53	5.25			
Years of education					290	-1.367	0.17
	Heard about procedure	158	15.436	2.856			
	Had not heard about the procedure	134	14.951	3.205			
Age					267	-0.915	0.36
	Retrospectively interested in the procedure	209	35.671	6.777			
	Retrospectively uninterested in the procedure	60	36.600	7.446			

Years of education				258	1.775	0.07
Retrospectively interested in the procedure	204	15.355	2.958			
Retrospectively uninterested in the procedure	56	14.535	3.411			

* significance at <0.01

Attitudes Towards the "Natural" Cesarean

Over 75% of the women (210, 77.8%) claimed that after watching the film, they would have preferred to have had a NC over a regular EC if it were possible at the time, while 60 (22.2%) declined the option (figure 1 above). No difference was found between the groups in age or years of education (table 3 above). No correlations were found between participant retrospective inclination to undergo a NC and parity ($\chi^2(1)=2.378$, P=0.123), indication for EC ($\chi^2(1)=2.557$, P=0.11), religiousness ($\chi^2(2)=3.843$, P=0.146), or socioeconomic status ($\chi^2(2)=3.614$, P=0.164). Furthermore, no correlation was found between the way in which the participant became familiar with the procedure and participant retrospective inclination to undergo a NC ($\chi^2(2)=1.674$, P=0.433).

The most frequent explanation for retrospectively preferring a NC over a regular EC, given in the unstructured portions (table 4) was the possibility of direct contact and bonding with the baby at birth. Many women stated that the immediate separation from their baby during their EC was difficult and distressing. Among the women who declined the option of retrospectively preferring a NC, the most common explanation was that it scared them and they would not want to see the baby being taken out (table 4).

Table 4.
Categories of explanations for and against the 'natural' cesarean – participants' responses about themselves

After watching the film, I would have wanted a 'natural' cesarean	
Category	Frequency
The 'natural' cesarean enables direct contact and bonding with the baby at birth	90
The 'natural' cesarean is the nearest possibility to a natural birth process for women who must undergo an elective cesarean	58
The 'natural' cesarean is more pleasant and less traumatic for mother and baby	35
The 'natural' cesarean enables couples to be active participants during the delivery	18
The 'natural' cesarean is slower, less stressful, and enhances a sense of security and calmness	10
The 'natural' cesarean accommodates both mother's feelings and the baby's needs	7
The 'natural' cesarean enables breastfeeding at birth	6
The 'natural' cesarean is emotionally and physically healthier for mother and baby	3
The 'natural' cesarean enables easier recovery from the surgery	3
After watching the film, I would not have wanted a 'natural' cesarean	
Category	Frequency
The 'natural' cesarean is scary \ I do not want to see the baby being taken out	15
I prefer having an elective cesarean under general anesthesia	8
Physicians are currently inexperienced in performing the technique \ I do not want to take any chances	4
I prefer that the medical team focuses on medically treating me and my baby	4
I do not relate to natural births and any natural aspect of birth	3
I do not breastfeed therefore I do not need a natural cesarean	3
I want the delivery to be over with as quickly as possible	3

Most frequent explanations for and against the 'natural' cesarean written by participants about themselves in the non-structured portion of the questionnaire after watching the film.

Of the 266 women (86.9%) who responded to the question about whether or not they believed their partner would have wanted them to have a NC, most (206, 77.4%) responded "yes" (figure 1 above). The most common reason for women to believe their partner would have wanted them to have a NC was that it would enable the partner to be actively involved in the birth process (table 5). Women who claimed their partner

would not want them to have a NC mostly stated their partner would be either turned off, scared, or reluctant to participate in the birth (table 5).

Table 5.
Categories of explanations for and against the 'natural' cesarean – participants' responses about their partners

After watching the film, I believe my partner would have wanted me to have a 'natural' cesarean	
Category	Frequency
The 'natural' cesarean would enable my partner to be actively involved during birth	38
My partner supports my decisions regarding the birth process	36
My partner wants to have direct contact and bond with our baby at birth	30
The 'natural' cesarean is the nearest possibility to a natural birth process for partners of women who must undergo an elective cesarean	24
The 'natural' cesarean is more pleasant and exciting for my partner	21
My partner would want me to have the procedure that is emotionally and physically healthier for me and our baby	18
My partner would want me to have an opportunity for a corrective birth experience and it could be an empowering, calmer, and corrective experience for him	12
My partner wants me to breastfeed at birth	3
I believe my partner would not have wanted me to have a 'natural' cesarean	
Category	Frequency
My partner would be turned off, scared or reluctant to participate in the delivery \ my partner wants the surgery to be over quickly	21
My partner is less involved in the type of cesarean birth \ I decide what type of birth I want \ my partner trusts my choice of birth	18

Most frequent explanations for and against the 'natural' cesarean written by participants about their partners in the non-structured portion of the questionnaire after watching the film.

Satisfaction with the "Natural" Cesarean

All 31 women (10.1%) who had had a NC graded their satisfaction with it. Twenty-nine of them marked being satisfied to various degrees: five (16.1%) were moderately satisfied, six (19.4%) were very satisfied and 18 (58.1%) were extremely satisfied. Two women (6.5%) stated they were dissatisfied with the surgery. The dissatisfied women and the women who were moderately satisfied claimed that although they signed up for a NC delivery, the staff either implemented the technique very partially (in most of the cases described by the participants, their baby was taken from them right away) or did not follow the technique protocol at all.

Among the explanations for their satisfaction given by women who were either satisfied or very satisfied with their NC were the following: a wonderful and positive experience, an attentive, sensitive, and professional medical staff, the active participation of their partner, and the immediate contact with their baby. Furthermore, 27 of the women who had a NC (87.1%) noted that in retrospect, they would have chosen it again, while four (12.9%) said they would not, however these women did not explain why. Finally, of the 15 participants who had previously had an EC and a NC, 12 (80%) claimed they were more satisfied with the NC than with the regular elective procedure and the rest (20%), were indifferent (figure 1 above).

Implementation of the 'Natural' Cesarean in Israeli Obstetric Departments

Responses were obtained from all 27 obstetrics departments in the country and grouped in four categories by implementation type and duration of technique implementation was noted (table 6).

Table 6.
Obstetric departments' response regarding the implementation of the 'natural' cesarean

Category	Time being implemented	Number of Obstetrics departments in category
1. currently practice the natural cesarean as described by its initiators	Up to 1 year	4
	4 years	1
2. currently practice a variation of the natural cesarean	1 year	2
	2-5 years	4

technique	10 years	1
3. currently do not practice the natural cesarean	n/a	13
4. in the process of implementing the natural cesarean technique	n/a	2

Discussion

This study revealed that after being presented with information regarding the NC and watching a 12-minute film about the procedure, the majority of women would have retrospectively chosen to undergo the procedure and believed their partner would have wanted them to as well. Regarding women's satisfaction with the NC, most of the women in the cohort who had a NC were satisfied with the procedure and would have chosen it again over a regular elective surgery. When women had experienced both a regular EC and a "natural" one, the majority claimed they were more satisfied with the NC. The women who had previously heard about the NC were found to be younger than women who had not heard about the procedure and more likely to have an academic education. In addition, our obstetric department survey indicates that the NC in not commonly practiced in Israel.

Our ability to interpret our findings in light of other evidence is limited. Most of the studies done on the NC have focused on its safety and neonatal and maternal medical outcomes (Armbrust et al., 2016; Magee, Battle, Morton & Nothnagle, 2014; Posthuma & Korteweg, 2017). To the best of our knowledge, no study has examined women's attitudes toward the NC and the ones that have assessed women's satisfaction with the technique are sparse. Schorn and colleagues (2015) described their experience of implementing the NC in their institution. Although they did not collect information about maternal satisfaction, they noted that the participating women did express appreciation of the attention given by the staff to improve their experience.

Armbrust and colleagues (2016) carried out a prospective randomized controlled trial to evaluate the safety and couples' birth experience of the Charite´ Cesarean Birth (CCB), a very similar technique to the NC, in comparison to couples who gave birth via a regular EC. Among other parameters, they evaluated birth experience and perceptions of the CCB. Apart from the important finding that the couples in the intervention group had a significantly better and more positive birth experience in

comparison to the control group, women in the intervention group who previously underwent a regular EC stated they would have chosen the CCB again over the regular one, similar to our findings.

The feeling of "having missed out" because of not having a vaginal delivery was more commonly expressed in the control group than in the intervention group. This is specifically echoed in our study, as women underscored the fact that they, and most likely their partners, would have preferred the NC, because it is the closest birth option to a natural birth for couples who have to undergo an EC. Interestingly, the duration of the whole surgery was perceived as significantly shorter by the couples in the Charite´ Cesarean Birth study (Armbrust et al., 2016) intervention group. We had found that the duration of the surgery was an issue for some women who turned down the NC on the grounds of wanting the procedure to be over as quickly as possible. This finding is important to point out to couples who are reluctant to have a NC because they believe it is longer than a regular EC. In addition, although we found that some women are concerned about seeing their baby being taken out by lowering of the drape, Armbrust and his colleagues (2016) report that in 92% of the cases the moment of the drape lowering was rated with the highest satisfaction scores. Again, this could be pointed out to couples who are concerned about this issue.

As previously stated, we had found that women who had formerly heard about the NC were younger than those who had not heard about it. This finding could be explained by the fact that the NC is a relatively new technique which was first written about in academic literature in 2008 (Smith et al., 2008) and according to our findings (table 6 above), was first implemented in Israel ten years ago, but has become more accessible only in recent years.

This is the first study to assess women's attitudes toward the NC. Apart from it being innovative, its strength lies in the fact that it assessed the attitudes of women who already experienced an EC once, which contributes to the value of their responses. An additional strength lies in the participants' written responses, which not only shed light on couples' unmet needs and dissatisfactions during a regular EC, but also clarify their major concerns with the NC, lending important information to the creation of a psychoeducation program about the technique, its advantages, and safety. Furthermore, this information is valuable to obstetric departments that are in the process of implementing the NC technique because it could assist in accommodating the needs of different women. For example, the surgical team can follow the technique protocol but avoid lowering the drape if the couple is reluctant or scared to see the baby being taken out of the woman's abdomen yet is interested in immediate skin-to-skin contact.

There are several limitations to this study. Since sampling was carried out using mainly Facebook groups, generalizability must be

made with caution, as Facebook users tend to be younger and better educated. However, since the Facebook population, even in underrepresented populations, is relatively large, some social scientists recommend this sampling method (Kosinski, Matz, Gosling & Popov, 2015). In our cohort, mean maternal age was 35.8 years mainly because we targeted online mother groups, but less educated women are underrepresented in our study as 65.5% of our participants have an academic degree. In addition, the Arab population (Muslims and Christians), which comprises 21% of the Israeli population (Israel Centeral Bureau of Statistics, 2016), is practically unrepresented despite posting the survey in online Arab groups (in Arabic). Also, true partner preferences are unknown because we collected women's assumptions about their partner preferences, rather than directly questioning them. Finally, the relatively low number of participants who had undergone a NC challenges our conclusions about them. Still, their non-structured responses shed important light on their feelings and preferences.

Conclusion

Our findings demonstrate the positive views Israeli women have about this technique and show that the NC is still far from becoming mainstream in Israeli obstetrics. Further research is needed on a more heterogeneous sample of women as well as on the Israeli Arab population and partners of women who had undergone a regular EC to better understand their attitudes and needs in order to accommodate them. In addition, further investigation of the experience of women who have undergone a NC is necessary, with a special emphasis on women who underwent both a regular EC and a "natural" one.

During our communication with Israeli obstetric departments, we learned that currently, a special committee held by the Israeli Ministry of Health is in the process of assessing the NC. Although preliminary, the findings of this study could assist this committee and contribute to policy change in obstetric departments in Israel. Conjunctly, it is essential that Israeli women who have to undergo an EC be informed about the possibility of having a NC. By supporting policy changes that respect patients' preferences and needs, and enhancing patient education, our findings can reinforce patient centeredness (Corrigan, Swift & Hurtado, 2001), which is a core component of quality health care (Briere, 2001).

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