

Research Article

Birth Preferences of Health Professionals in Eastern Turkey: Cesarean Section Rates Still on the Rise: A Cross-Sectional Study

 Ezel Bilge Yerli,¹  Elif Oksan Calikoglu,¹  Berrin Goktug Kadioglu²

¹Department of Public Health, Ataturk University Faculty of Medicine, Erzurum, Turkey

²Department of Gynecology & Obstetrics, University of Health Sciences, Erzurum Regional Training Hospital, (Nenehatun Maternity Hospital), Erzurum, Turkey

Abstract

Objectives: The incidence rates of primary Cesarean section (CS) delivery in Turkey have jumped from 21.2% in 2003 to 53.1% in 2016, exceeding by over thrice the maximum 15% recommended 30 years ago by the WHO. While this trend has been partly attributed to maternal request, few studies have actually examined the delivery preferences of women. Even fewer studies have focused on health professionals as a parturient subpopulation. This study aims at determining the Turkish health personnel's preferred types of birth, the reasons, and the factors associated with their preferences.

Methods: Randomly selected from a total eligible population of 2032 female healthcare, the workers were actively employed during the study time in Erzurum, 450 women were surveyed in their work settings through a 23-item structured questionnaire. Data for 412 women was analyzed using Student's T-test, Pearson's Chi-Square test, and Logistic Regression analysis.

Results: The participants gave birth to a total of 568 live deliveries, of which 331 (58.3%) were by CS. Out of the 288 women who gave birth to a baby, 197 (68.4%) experienced at least one CS delivery. Medical doctors had the highest CS rates 85.5% (n=47), followed by academic staff 73.0% (n=27), paramedics, 72.2% (n=13), nurses 66.3% (n=53), and midwives 58.2% (n=57) (Chi-Square=12.804, $p=0.012$). Of the participants, 165 (57.2%) had an antenatal visit to secondary care hospitals, while only 46 women (15.9%) visited their family physician.

Conclusion: Compared to the general population, Cesarean deliveries are more common among Turkish health professionals. The even higher CS rates among medical doctors suggest that although education campaigns might be useful to reduce this risky health behavior, more radical steps need to be taken, including economic measures and policy changes, preferably the legislation by the state.

Keywords: Abdominal delivery, birth preference, cesarean section, C-section, health personnel, Turkey

Cite This Article: Yerli EB, Calikoglu EO, Kadioglu BG. Birth Preferences of Health Professionals in Eastern Turkey: Cesarean Section Rates Still on the Rise: A Cross-Sectional Study. *EJMI* 2020;4(4):433–441.

The World Health Organization (WHO) recommends a maximum Cesarean section (CS) rate of 15%.^[1] Only a century ago, most of the deliveries in Turkey were carried out in the home environment. The introduction of modern medical treatments like analgesia, anesthesia, effective antibiotic use, and surgical techniques has not only ushered

in Cesarean births, moving medicine to a higher level but they have also opened up a Pandora's box.^[2] Although the CS, also known as Cesarean delivery (CD), is regarded today as a safe surgical procedure, it nevertheless can introduce many undesirable consequences.^[3]

Unnecessary Cesarean births continue to be a public

Address for correspondence: Ezel Bilge Yerli, MD. Ataturk Universitesi Tip Fakultesi, Halk Sagligi Anabilim Dalı, Erzurum, Turkey

Phone: +90 530 690 85 52 **E-mail:** bilgeyerliezel@gmail.com

Submitted Date: May 03, 2020 **Accepted Date:** July 29, 2020 **Available Online Date:** September 19, 2020

©Copyright 2020 by Eurasian Journal of Medicine and Investigation - Available online at www.ejmi.org

OPEN ACCESS This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License.



health issue that is very much related to women and society because of the health risks it carries for mother and baby compared to normal births.^[4] The world average for CS rates has been reported as 18.6% of all types of delivery, ranging from 6% to 27.2% in the least and most developed countries, respectively.^[5] Worrying data trends come from the 1998 Turkish Demographic and Health Survey (TDHS-98) and its subsequent iterations in the years 2001, 2003, 2008, 2013, and 2016. During the preceding decade, the TDHS-98, the proportion of deliveries by CS increased from 5.7% to 20.8%.^[6] When only hospital births were considered, the percentage of Cesarean deliveries for the year 1998 was 26.1%; in 2001 it climbed to 30%, double the maximum rate of CS recommended by the WHO. The trend for CS deliveries kept rising in Turkey since 1998. According to the 2008 Turkey Demographic and Health Survey (TDHS-2008) report,^[7] 36.7% of babies were born through CS, which increased to 48% in 2013.^[8] This is triple the maximum rate of CS recommended by the WHO. In 2016, the CS rate in Turkey had even touched the dangerous level of 53.1%.^[9]

The CS rate was strongly associated with maternal education, maternal age, place of delivery, antenatal care, and household welfare.^[6] These findings imply that women with higher socioeconomic status are more likely to accept C-sections than women coming from the lower-middle class of the society. On the other hand, the trend of increasing CS rates indicates that Turkey is headed towards a relatively expensive medical delivery system. Therefore, the reduction of CS rates should be a priority for any reproductive health program in Turkey in order to make it under the affordable range for the financially weaker sector of the society. It is worrying that in Turkey, CS delivery rates are higher among health professionals than in the non-medical personnel. A study conducted in the Western Turkey^[10] demonstrated a 74.7% CS delivery rate among specialists of pediatrics, gynecology & obstetrics.

Thus, there is a dire need for continually monitoring the status and early intervention concerning health policies and public education. On the other hand, the rapid and unstoppable surge in CS deliveries is another necessity for epidemiologic studies in this subject. We hypothesized that CS proportions are also high among health professionals working in Eastern Turkey. If indeed, the "epidemic" of CS in healthcare professionals has national figures, then only national, large-scale interventions could redress this public health problem.

Objective

This study was conducted to investigate the status of CS and its association with demographic characteristics among health professionals working in Erzurum.

Methods

Study Design

This cross-sectional descriptive and analytical research study was conducted in Erzurum during January 2018. Study reporting was done under the STROBE guidelines.^[11]

Setting

Erzurum is an Eastern Anatolian city with 750 thousand inhabitants. The proportion of CS deliveries in the region for 2015 was reported as 34%.^[12]

Participants

The total eligible study sample consisted of the 2032 female healthcare workers, actively employed during the study time in Erzurum. The list of these women was obtained from the local health directorate (permission number 52918460-806.01.03). Stratified, according to professions (nurse, midwife, medical doctor, academic staff, and paramedic), 450 women were randomly selected from the list using a table of random numbers. A formal invitation letter was delivered by mail to all 450 health workers to participate in the study. The letters were sent via the official mailing system of the local health directorate. A reminder telephone call was made a week later than the letter to reiterate the invitation. Eventually, 412 of the 450 invited health workers participated in our study, giving a healthy response rate of 91.5% (Fig. 1).

Variables

The study questionnaire consisting of 23 items organized under three headings: 1. Socio-demographic characteristics (age, marital status, educational attainment, profes-

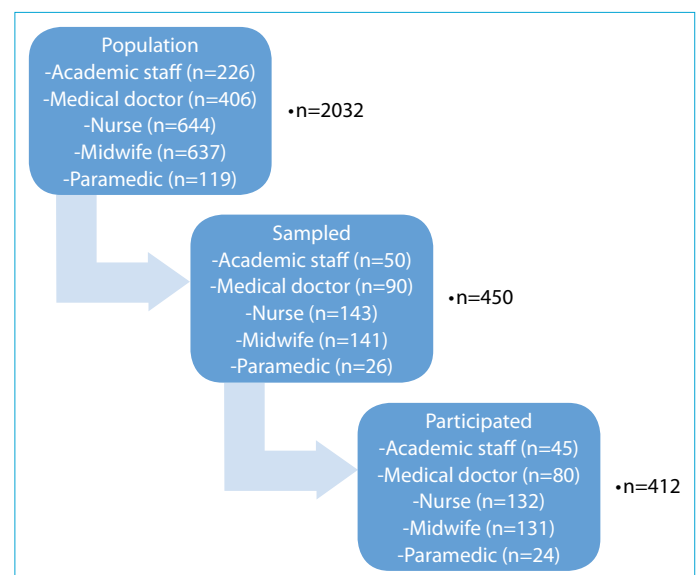


Figure 1. Participant flow diagram.

sion), 2. Obstetrics characteristics (gravida, previous modes of delivery including normal vaginal and Caesarean deliveries, antenatal and postpartum visits), and 3. Opinions on CS and normal vaginal delivery and preferences. The history of CS was the basic resultant variable of the study. A thorough literature search and expert views on previous work conducted in Turkey^[9] served as the basis of the survey instrument building. After an expert panel (including three specialists in public health, two nurses, a midwife, two obstetrician-gynecologists, one social worker, and one paramedic) established content validity, three focus group discussions from the target population with five participants in each group were conducted for face validity. Items needed to be modified, removed, or added comprehensiveness, grammar and spellings were thoroughly considered for improvement. The final version of the 23-item data collection tool consisted of six questions collecting demographic information, one question asking for the participant's number of normal vaginal delivery (NVD) vs. CS according to the birth order, six questions checking the opinions of participants on NVD and CS, and eight items seeking to explore possible correlations of study variables with the CS experience. The 23-item questionnaire had high internal reliability with a Cronbach alpha value of 0.835.

Data Sources/Measurement

The procedure was explained in detail to all 412 participants before the commencement of the survey. Additionally, the confidentiality of individual participants was strictly ensured. The questionnaires were initiated preserving the identities of the participants and also, no incentives have been offered to participants. All participants were visited in their working places by the principal investigator and surveyed face to face via a 23-item structured questionnaire. Data collection took around 30 minutes, and it was done in a comfortable place at work selected by the participants.

Bias

Data collection was completed by the same researcher to avoid inter-observer bias. All participants were informed about the study's objectives before commencing data collection and reminded about the importance of providing correct data. In the questionnaire, there was brief information about the research to ensure that the research data was obtained correctly, and participants' identities were not recorded.

Study Size

The Sample size calculation was done with the applet developed by Russ Lenth.^[13] A total of 393 participants had to be selected from a finite population of 2032 persons to detect an expected probability of 34% with a marginal er-

ror of 5% and a confidence of 98%. Taking non-participants into account, we aimed for 450 cases.

Statistical Analysis

Data was entered into the computer and analyzed using the SPSS 20.0 software. The results were presented as frequencies, percentages, means, and standard deviations (SD). For the comparison of the demographic and outcome data, the independent samples Student's t-test was used for numerical variables, and the Chi-Square test was used for categorical variables. The independent effects of the studied variables on the primary outcome were investigated through the logistic regression analysis. The analysis was performed among women with previous delivery (n=288). Using the enter method, variables significant on bivariate analysis and having clinical rationale were included in the model. A *p*-value of <0.05 was considered statistically significant.

Results

Participants

Data for 412 participants was analyzed. The mean age was 33.51 ± 7.83 years (95% CI: 32.75–34.27). Of the married ones, the mean age of first marriage was 24.83 ± 3.35 years (95% CI: 24.48–25.19). Other participant characteristics are given in Table 1.

Descriptive Data

The proportions of participants having experienced CS, NVD, and both CS and NVD were 38.8% (n=160; 95% CI: 49.8–61.2), 22.1% (n=91; 95% CI: 26.4–37.1), and 9.0% (n=37; 95% CI: 9.4–17.1), respectively. 124 participants (30.1%; 95% CI: 25.8–34.7) never delivered a baby. Only one participant had an NVD after CS. Of the 288 women who ever delivered a baby, 11 (3.8%; 95% CI: 2.0–6.5) were single.

The participants gave birth to a total of 568 live deliveries, of which 331 (58.3%) were through CS. It can be observed from Table 2 that the proportion of CS deliveries was increasing with the order of delivery. Out of the 288 women who gave birth to a baby, 197 (68.4%; 95% CI: 62.9–73.6) experienced at least one CS delivery. In 118 women (72.8%; 95% CI: 65.6–79.2) the reason for CD was physician's advice or medical indication.

Of the 288 women who ever delivered a baby, 165 (57.2%; 95% CI: 50.2–61.5), made an antenatal visit during their last pregnancy to secondary care hospitals, 134 (46.5%; 95% CI: 40.1–51.5) to private hospitals, and 70 (24.3%; 95% CI: 19.3–29.1) to tertiary care hospitals. Only 46 women (15.9%; 95% CI: 11.8–20.1) received antenatal care from the family practice center (FPC).

Table 1. Participant characteristics

	n	%	95% CI Lower
Educational status			
Middle school	59	14.3	11.2
High school	115	27.9	23.7
University	238	57.8	53.0
Occupation			
Nurse	132	32.0	27.7
Midwife	131	31.8	27.4
Medical doctor	80	19.5	15.8
Academic staff	45	10.9	8.2
Paramedic	24	5.8	3.9
Education of spouse			
Middle school	1	0.3	0.0
High school	50	14.9	11.4
University	284	84.8	80.6
Marital status			
Married	327	79.4	75.3
Single	85	20.6	16.9
History of pregnancy			
Yes	304	73.8	69.4
No	108	26.2	22.1
History of live birth			
Yes	288	69.9	65.3
No	124	30.1	25.8

Nearly one-fourth of the participants were not aware that NVD would be possible after a CS. On the other hand, the preferred mode of birth was NVD for the vast majority of the participants (Table 3). Although most participants did not find the high CS proportions in Turkey acceptable, only 23.1% expected the figures to normalize (Table 3).

Outcome Data

The difference of the mean age of participants with and without CS experience was not statistically significant

(36.76 ± 6.40 ; 95% CI: 35.84–37.64 vs. 36.64 ± 7.49 ; 95% CI: 35.08–38.20 years, respectively) ($t=0.115$, $p=0.908$). Among the studied variables, occupation, delivery preference, and opinion on high CS rates were found to be related to CS experience (Table 4).

There was a significant difference concerning the delivery history and preferred mode of birth in the future. Those who experienced only CS preferred CS; however, the proportion was lower among participants who experienced both CS and NVD as shown in Figure 2. Of the participants with a history of NVD, CS, both NVD and CS, and none, 7.7% ($n=7$), 31.6% ($n=50$), 24.3% ($n=9$), and 16.9% ($n=21$), respectively considered the delivery through CS in the future (Chi-Square=21.810, $p<0.001$).

A binary logistic regression model was built in order to check for the effects of the independent variables of age (numerical), occupation (categorical) and delivery preference (categorical) on CS status, which revealed that birth preference of the women (odds ratio 5.5 [95% CI 2.4–13.0]; Wald=15.965, $p<0.001$) and occupation were the two significant variables affecting CS status. Compared with midwives, who had the lowest proportion of CS history, medical doctors had an odds ratio of 4.4 [95% CI 1.8–10.7] (Wald=11.222, $p=0.001$) in reporting an experience of CS.

Discussion

Key Results

Unlike Angeja et al.'s study^[13] which concluded that educational status of the women did not affect the delivery type preferences, our study confirms the results of other studies such as Zhao Y. and Chen S.,^[14] reporting a higher choice for CD in highly educated women versus those with lower educational qualification. However, this finding should be interpreted in the light that our sample participants were all highly qualified professionals, so there might be some difference in the results with a different research sample.

Table 2. Proportions of NVD vs. CS according to the birth order

	NVD		95% CI		CS		95% CI		Total
	n	%	Lower	Upper	n	%	Lower	Upper	n
1 st delivery	127	44.1	38.4	49.9	161	55.9	50.1	61.6	288
2 nd delivery	82	40.2	33.6	47.0	122	59.8	53.0	66.4	204
3 rd delivery	23	37.1	25.9	49.5	39	62.9	50.5	74.1	62
4 th delivery	4	36.4	13.7	65.2	7	63.6	34.8	86.3	11
5 th delivery	1	50.0	6.1	9.9	1	50.0	6.1	93.9	2
6 th delivery	0	0.0	–	–	1	100.0	–	–	1
Total	237	41.7			331	58.3			568

NVD: Normal Vaginal Delivery; CI: Confidence interval; CS: Cesarean Section.

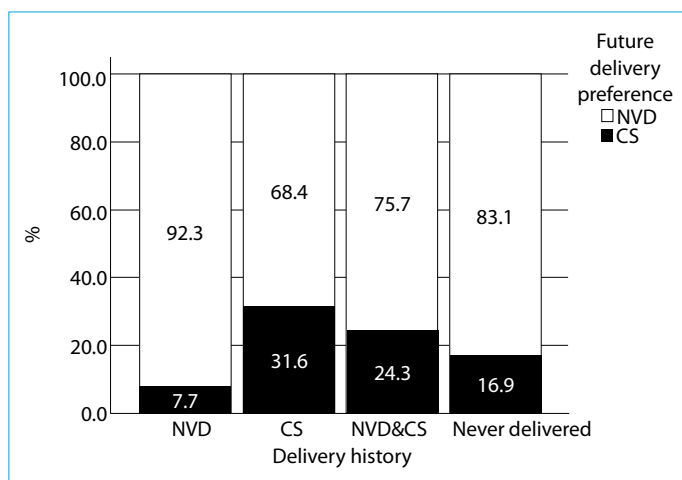


Figure 2. Distribution of future delivery preferences according to delivery experiences.

Table 3. Opinions of participants on normal vaginal delivery and Caesarean sections

	n	%	95% CI Lower
Is it possible to have NVD after a CS			
Yes	315	76.5	72.2
No	83	20.1	16.5
No idea	14	3.4	2.0
Which mode of birth would you prefer in the future?			
NVD	323	78.8	74.6
CS	87	21.2	17.5
Do you have information about the childbirth education classes?			
Yes	303	73.5	69.1
No	109	26.5	22.4
Would it change your delivery preference if your spouse could attend the labor?			
Yes	155	37.6	33.0
No	257	62.4	57.6
What do you think about the CS prevalence of 53.1% in Turkey?			
Acceptable	57	13.8	10.8
Not acceptable	316	76.7	72.4
No opinion	39	9.5	6.9
Do you think the CS figures in Turkey can be lowered to 10–15% as suggested by the WHO?			
Yes	95	23.1	19.2
No	272	66.0	61.3
No opinion	45	10.9	8.2

NVD: Normal Vaginal Delivery; CS: Cesarean Section; WHO: World Health Organization.

Our study points out that the most common reasons for CD were either physician's advice or medical indication. These findings strongly suggest that doctors, instead of the expectant mothers, may, in fact, be responsible for the sharp increase in CS delivery rates in Turkey. If so, education should also target doctors, not only pregnant women. Moreover, the study demonstrated that CS deliveries among health professionals working in Erzurum were higher as compared to the average Turkish population. Among the significant variables affecting CS deliveries were personal preferences and the medical profession.

Interpretation

The median age of first marriage among our sample was higher as compared to the general Turkish population. According to the Turkey Demographic and Health Survey 2013, the highest median age at first marriage was reported as 22.0 in the 25–29 years age bracket.^[8] Although there is an increasing trend in the nation to marry later in life, the marked difference in our sample could be attributed to the higher education status of our participants if compared to the general population. However, we do not have any statistical or data foundation to confirm this claim.

Although marriage is fundamental in Turkey from a demographic perspective because almost all births take place within marriages,^[7] the fact that nearly 4% of our single participants gave birth suggests that this tradition may be changing.

The CS proportions in our sample are significantly higher than the reported population means for Turkey as a country^[8] but lower than the figures reported from Western parts of Turkey;^[10] perhaps this could be partially attributed to the strict following of people from Eastern Anatolia's to the traditional and patriarchal social values and norms. We hypothesized that people with traditional values might be more bound to NVD compared to CS, as CS is considered to be a modern way of delivering babies.

Despite the warnings of the Turkish Ministry of Health threatening to fine hospitals with the highest CS proportions,^[15] CS deliveries show an increasing trend in Turkey.^[9] Although increases in CS rates up to 10–15% have been previously found to be associated with reductions in maternal, neonatal, and infant mortality,^[16] the World Health Organization (WHO) made a statement on this issue in 2015, mentioning that CS rates above the 15% level are no longer associated with reduced mortality.^[17] High age at first marriage, getting pregnant in a later period, planning to have fewer children, the existence of infertility problems, and the concepts of "risky pregnancy" and "precious baby" have been postulated among the reasons for this increase

Table 4. Comparisons of some study variables according to CS experience

	Ever had a CS delivery								χ^2
	No		95% CI		Yes		95% CI		
	n	Row %	Lower	Upper	n	Row %	Lower	Upper	
Education									
Middle school	11	35.5	20.5	53.0	20	64.5	47.0	79.5	1.107
High school	31	34.8	25.5	45.1	58	65.2	54.9	74.5	
University	49	29.2	22.7	36.4	119	70.8	63.6	77.3	
Occupation									
Medical doctor	8	14.5	7.1	25.6	47	85.5	74.4	92.9	12.804
Academic staff	10	27.0	14.8	42.7	27	73.0	57.3	85.2	
Paramedic	5	27.8	11.5	50.6	13	72.2	49.4	88.5	
Nurse	27	33.8	24.1	44.5	53	66.3	55.5	75.9	
Midwife	41	41.8	32.4	51.7	57	58.2	48.3	67.6	
Is it possible to have NVD after a CS?									
Yes	72	31.7	25.9	38.0	155	68.3	62.0	74.1	1.974
No	14	27.5	16.7	40.7	37	72.5	59.3	83.3	
No idea	5	50.0	22.4	77.6	5	50.0	22.4	77.6	
Which mode of birth would you prefer in the future?									
NVD	84	38.2	32.0	44.7	136	61.8	55.3	68.0	17.796
CS	7	10.6	4.9	19.7	59	89.4	80.3	95.1	
Do you have information about the pregnant classes?									
Yes	74	33.2	27.3	39.5	149	66.8	60.5	72.7	1.151
No	17	26.2	16.7	37.7	48	73.8	62.3	83.3	
Would it change your delivery preference if your spouse could attend the labor?									
Yes	63	33.2	26.8	40.1	127	66.8	59.9	73.2	0.629
No	28	28.6	20.3	38.0	70	71.4	62.0	79.7	
What do you think about the CS prevalence of 53.1% in Turkey?									
Acceptable	3	6.7	1.9	16.7	42	93.3	83.3	98.1	16.78
Not acceptable	80	37.6	31.3	44.2	133	62.4	55.8	68.7	
No opinion	8	26.7	13.5	44.1	22	73.3	55.9	86.5	
Do you think the CS figures in Turkey can be lowered to 10-15% as suggested by the WHO?									
Yes	28	40.0	29.1	51.7	42	60.0	48.3	70.9	3.117
No	53	28.5	22.4	35.3	133	71.5	64.7	77.6	
No opinion	10	31.3	17.3	48.4	22	68.8	51.6	82.7	

CS: Cesarean section; CI: Confidence interval; NVD: Normal vaginal delivery.

in the CS rates.^[18] The WHO developed a C-Model that provides a customized benchmark for Cesarean section rates in health facilities and systems.^[19] The C-model uses maternal features such as demographic information, obstetric characteristics, and complications, to calculate an individualized expected CS rate. According to a recent study in Turkey, CS rates were higher than the WHO reference population for all Robson groups, women in Group 5 (Multipa-

rous with prior cesarean section, singleton, cephalic, ≥ 37 weeks) playing the dominant role with a 25.2% in size of the group and 24.4% contribution to the CS rate.^[20] Access to CS is considered an essential component of obstetric care.^[21] Therefore, very low population level CS rates are indicative of a lack of access to service, which may contribute to maternal and newborn mortality and morbidity.^[22,23] On the contrary, the very high CS rates point to high levels of

Cesarean use without medical indication, which may result in adverse outcomes such as infection, hemorrhage, and surgical complications.^[24,25] In a recent review by Sandall et al.,^[26] increased risks for the mother (such as uterine rupture, abnormal placentation, ectopic pregnancy, stillbirth, and preterm birth), as well as the baby (such as altered immune development, allergy, atopy, asthma, and reduced intestinal microbiome diversity), were emphasized.

The epidemic trend of CS is actually a global concern, especially for developed countries. In 2010, a study was conducted among specialists of gynecology and obstetrics, midwives, and nurses in China, which reported a 69.7% CS rate.^[27] Compared with the study of Göksal et al.^[10] from Western Turkey, who indicated 74.4% CS proportion among specialists of pediatrics and gynecology & obstetrics, our findings demonstrate even higher rates among medical doctors, confirming our hypothesis. On the other hand, while 78.8% of the participants in Göksal et al.'s study found the CS figures of Turkey for the year 2015 as unacceptable, this percentage was lower in our sample.

One-fifth of the participants intended to deliver by CS in the future, which, as compared to the current practice, was considered low. Furthermore, medical doctors had an almost four-fold increased probability of CS. It can be speculated that doctors may have easier access to CS services due to their potential relationships with their peers. However, there is no literature confirming such a discrepancy in access to care. On the other hand, one-third of our sample did not deliver a baby. Therefore, previous birth experience is a factor to be addressed when we consider limiting the CS proportions. Acknowledging that a third of women were unaware that vaginal delivery could be performed after a CS, their previous experience of the Cesarean section becomes more crucial in their future preferences.

Although there are high-income countries with acceptable CS rates, middle-to high-income countries were shown to have comparatively higher CS proportions.^[4,28] Besides, an increase in CS rates has been shown to be related to access to care.^[4] Hence, we consider that the evident overuse of CS during recent years in Turkey can also be related to the policies of the Turkish Ministry of Health, facilitating access to health care. From this perspective, some liability can be attributed also to the current health system in Turkey. Due partly to the performance-based health system, introduced in 2003,^[29] secondary and tertiary health care centers are trying to attract more patients by doing more tests/interventions, mostly for financial reasons. There seems to be a kind of competition between primary care and secondary/tertiary care clinics. As to health statistics released by the Ministry of Health of Turkey,^[12] out of 8.4 doctor visits/per-

son/year in the year 2015, 2.7 were to the general practitioner while remaining 5.7 were to secondary/tertiary care units. With the negligible number of antenatal visits in the FPC, our results are supporting the overuse of specialized healthcare even for prenatal care. Almost a century later, John Whitridge Williams' words "*the excellence of an obstetrician should be gauged not by the number of Cesareans which he performs, but rather by those he does not do*" ring truer than ever.^[30]

Strengths and Limitations

Although we had an adequate sample size in this study, representing all health professionals, there may be some limitations due to the study design. The general boundaries of questionnaire studies apply to demographic questions only. A regression analysis was done to rule out confounding variables. Some professions such as medical secretaries or cleaning personnel working in health institutions were not included in the sample because their lack of or insufficient medical and/or nursing education, training, and experience would not have been adequate to test our research hypotheses. Also, the local populationspecific to a region in Turkey, as well as the high proportion of well-educated people, have to be remembered when interpreting our findings.

Conclusion

Compared to the general population, these results demonstrate significantly higher CS rates among the health professionals of our sample. The percentages are even higher among medical doctors, which suggests that access to the facilities might be a significant contributing factor to the alarmingly high CS rates. Although education campaigns might be useful to combat this risky health behavior, it cannot be claimed that health professionals lack knowledge about the risks of CS. Hence, in our opinion, additional steps must be taken, including economic measures, and radical policy changes should have the priority. This study showed that only a minority of the studied women expressed a preference for CS. Although CD on women's demand has been suggested as a relevant factor for the hike of CS rates in many countries, based on our study findings, it seems very unlikely that women's preferences alone would explain the high frequencies in Turkey. Further studies are needed to assess the impact of women's decision on the delivery modes in Turkey, and to better estimate the contribution of obstetricians to the rise of CD rates. Such studies would inform policy changes towards the more rational use of C-sections, hopefully dropping the national rates and bringing them closer to the 10%–15% recommended by the WHO.

Disclosures

Ethics Committee Approval: The ethics committee of Atatürk University Medical Faculty provided the ethics committee approval for this study (30.11.2017-06-09).

Peer-review: Externally peer-reviewed.

Conflict of Interest: None declared.

Authorship Contributions: Concept – E.B.Y., E.O.C.; Design – E.B.Y.; Supervision – E.B.Y., E.O.C.; Materials – E.O.C., E.B.Y.; Data collection &/or processing – E.O.C., E.B.Y.; Analysis and/or interpretation – E.B.Y., E.O.C., B.G.K.; Literature search – E.B.Y., E.O.C.; Writing – E.B.Y., E.O.C.; Critical review – E.B.Y., E.O.C., B.G.K.

Financial Support: None.

References

- Robson SJ, de Costa CM. Thirty years of the World Health Organization's target caesarean section rate: time to move on. *Med J Aust* 2017;206:181–5.
- Sherrod MM. The History of Cesarean Birth From 1900 to 2016. *J Obstet Gynecol Neonatal Nurs* 2017;46:628–36.
- Ko SY, Park SW, Sohn IS, Lee JY, Kwon HS, Hwang HS, et al. Interventional management for complications following caesarean section. *Br J Radiol* 2011;84:204–9.
- Boatin AA, Schlottheuber A, Betran AP, Moller AB, Barros AJD, Boerma T, et al, Hosseinpoor AR. Within country inequalities in caesarean section rates: observational study of 72 low and middle income countries. *BMJ* 2018;360:k55.
- Betrán AP, Ye J, Moller AB, Zhang J, Gülmezoglu AM, Torloni MR. The Increasing Trend in Caesarean Section Rates: Global, Regional and National Estimates: 1990-2014. *PLoS One* 2016;11:e0148343.
- Koc I. Increased cesarean section rates in Turkey. *Eur J Contracept Reprod Health Care* 2003;8:1–10.
- Turkey Demographic and Health Survey 2008. Ankara: 2008. Available at: http://www.hips.hacettepe.edu.tr/eng/tdhs08/TDHS-2008_Preliminary_Report.pdf. Accessed Jun 02, 2018.
- Turkey Demographic and Health Survey 2013. Ankara: 2013. Available at: <https://dhsprogram.com/pubs/pdf/FR352/FR352.pdf>. Accessed Jun 2, 2018.
- Köse MR, Başara BB, Güler C, Çağlar İS, Özdemir TA, Aygün A, et al. Republic of Turkey Ministry of Health. Health Statistics Yearbook 2016. Ankara: 2017. Available at: <https://dosyasb.saglik.gov.tr/Eklenti/13183,sy2016turkcepdf.pdf?0>. Accessed Sep 29, 2020.
- Göksal E. What Do Obstetricians and Gynecologists and Pediatricians Think About Cesarean Delivery Rates? Bursa Example. Bursa: Uludağ University Medical Faculty; 2017.
- von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP; STROBE Initiative. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. *PLoS Med* 2007;4:e296.
- Başara BB, Güler C, Soyututan İ, Aygün A, Özdemir TA. Republic of Turkey Ministry of Health Health Statistics Yearbook 2015. Ankara: 2016. Available at: <https://dosyasb.saglik.gov.tr/Eklenti/6118,healthstatisticsyearbook2015pdf.pdf?0>. Accessed Sep 29, 2020.
- Angeja AC, Washington AE, Vargas JE, Gomez R, Rojas I, Caughey AB. Chilean women's preferences regarding mode of delivery: which do they prefer and why? *BJOG* 2006;113:1253–8.
- Zhao Y, Chen S. Psychosocial factors for women requesting cesarean section. *IJCM* 2013;4:395–9.
- Republic of Turkey Ministry of Health. Hospitals with unnecessarily high cesarean section rates will be punished. Available at: <https://www.saglik.gov.tr/TR,13458/sezaryen-oranlarigereksiz-yukse-olan-hastaneleri-cezalandiracagiz.html>. Accessed May 25, 2018.
- Betran AP, Torloni MR, Zhang J, Ye J, Mikolajczyk R, Deneux-Tharoux C, et al. What is the optimal rate of caesarean section at population level? A systematic review of ecologic studies. *Reprod Health* 2015;12:57.
- WHO. WHO Statement on Caesarean Section Rates. Available at: http://apps.who.int/iris/bitstream/handle/10665/161442/WHO_RHR_15.02_eng.pdf?sequence=1. Accessed May 23, 2018.
- Bektaş E. Survey on the normal delivery versus cesarean section preferences of the women applying to our outpatient pregnancy follow-up clinics. Master thesis, İstanbul: Dr. Lütfi Kırdar Kartal Education and Research Hospital; 2008.
- Souza JP, Betran AP, Dumont A, de Mucio B, Gibbs Pickens CM, Deneux-Tharoux C, et al. A global reference for caesarean section rates (C-Model): a multicountry cross-sectional study. *BJOG* 2016;123:427–36.
- Eyi EGY, Mollamahmutoglu L. An analysis of the high cesarean section rates in Turkey by Robson classification. *J Matern Fetal Neonatal Med* 2019;1–11.
- WHO, UNFPA, UNICEF, AMDD. Monitoring emergency obstetric care: a handbook. Available at: <https://www.who.int/reproductivehealth/publications/monitoring/9789241547734/en/>. Accessed Sep 30, 2020.
- Dumont A, de Bernis L, Bouvier-Colle MH, Bréart G; MOMA study group. Caesarean section rate for maternal indication in sub-Saharan Africa: a systematic review. *Lancet* 2001;358:1328–33.
- Betran AP, Torloni MR, Zhang JJ, Gülmezoglu AM; WHO Working Group on Caesarean Section. WHO Statement on Caesarean Section Rates. *BJOG* 2016;123:667–70.
- Souza JP, Gülmezoglu A, Lumbiganon P, Laopaiboon M, Carroli G, Fawole B, et al; WHO Global Survey on Maternal and Perinatal Health Research Group. Caesarean section without medical indications is associated with an increased risk of adverse short-term maternal outcomes: the 2004-2008 WHO Global Survey on Maternal and Perinatal Health. *BMC Med* 2010;8:71.

25. Lumbiganon P, Laopaiboon M, Gülmezoglu AM, Souza JP, Taneepanichskul S, Ruyan P, et al; World Health Organization Global Survey on Maternal and Perinatal Health Research Group. Method of delivery and pregnancy outcomes in Asia: the WHO global survey on maternal and perinatal health 2007-08. *Lancet* 2010;375:490–9.
26. Sandall J, Tribe RM, Avery L, Mola G, Visser GH, Homer CS, et al. Short-term and long-term effects of caesarean section on the health of women and children. *Lancet* 2018;392:1349–57.
27. Ouyang YQ, Zhang Q. A study on personal mode of delivery among Chinese obstetrician-gynecologists, midwives and nurses. *Arch Gynecol Obstet* 2013;287:37–41.
28. Miller S, Abalos E, Chamillard M, Ciapponi A, Colaci D, Comandé D, et al. Beyond too little, too late and too much, too soon: a pathway towards evidence-based, respectful maternity care worldwide. *Lancet* 2016;388:2176–92.
29. Tatar M, Mollahaliloğlu S, Sahin B, Aydin S, Maresso A, Hernández-Quevedo C. Turkey. Health system review. *Health Syst Transit* 2011;13:1–186, xiii-xiv.
30. Freyermuth MG, Muños JA, Ochoa MDP. From therapeutic to elective cesarean deliveries: factors associated with the increase in cesarean deliveries in Chiapas. *Int J Equity Health* 2017;16:88.