

Effect of sexual dysfunction on women's preference for delivery methods: a social media-based survey

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Background: Although vaginal delivery (VD) is the natural and preferred mode of delivery, cesarean section (C/S) deliveries increased disproportionately during the last decades. We hypothesized that women's preference of a mode of delivery may have a relationship with their sexual dysfunction. **Methods:** This survey study recruited women who had already had VD or C/S. We evaluated sexual function via the Golombok-Rust Inventory of Sexual Satisfaction (GRISS) and examined the relationship between possible sexual dysfunction and previous preference for delivery mode. Participants were enrolled from among the author's Instagram followers. **Results:** Overall, 190 women were included in the analysis. The median age was 30 years (range: 19–45 years). While 86 participants (45.3%) had VD, 104 participants (54.7%) underwent C/S. Overall and subscale GRISS scores were similar in both groups. We also compared the responses to the 28 questions of the GRISS inventory. No significant difference was found between the groups except for question 11 about the vaginal discomfort felt when a finger is inserted. Patients who had VD were less likely to insert their fingers into their vagina without discomfort. **Conclusions:** With a novel social media recruitment method, we showed that sexual dysfunction was not related to the mode of delivery among participant women. However, we found that patients who had VD were less likely to feel discomfort when they insert their fingers into their vaginas.

Keywords

Sexual dysfunction; Cesarean section; Vaginal delivery; Mode of delivery

1. Introduction

Vaginal delivery (VD) is the natural and hence the preferred mode of delivery in most pregnancies. However, in some clinical circumstances, cesarean section (C/S) is necessary to preserve the health of the fetus and mother [1–4]. However, recent decades witnessed a disproportionate and unjustified increase in the rates of C/S deliveries. Maternal requests account for a considerable portion of this demand for C/S delivery. Several attempts have been made to curb the increase in the rate of C/S in favor of VD [5]. However, in many middle- and high-income countries, C/S rates are still unacceptably high [6, 7]. The code on the conditional use of C/S was enforced in 2012 in Turkey; however, C/S rates continued to increase between 1993 and 2003 [8].

To reverse this trend, the reasons behind women's preference for C/S should be understood well. Several studies to date undertook this daunting task. It is daunting, because multiple factors, including cultural, educational, and regulatory rules, affect the final choice of mode of delivery [6].

The impact of C/S delivery on postpartum sexual functioning has been thoroughly investigated. A meta-analysis [9] investigating the influence of mode of delivery on short- and long-term sexual function in ten studies comprising 2851 Chinese primiparous women concluded that the mode of delivery did not affect the short-term or long-term sexual satisfaction after delivery. However, to the best of our knowledge, the opposite effect (the effect of sexual function on the preference for the delivery mode) has not been examined yet.

We hypothesized that sexual dysfunction might cause some fears and prejudices about vaginal birth. Hence, such women may prefer C/S over vaginal birth. Since a better understanding of the driving forces for the preference of C/S is of paramount importance, we aimed to evaluate whether sexual dysfunction had any effect on the preference of a mode of delivery.

2. Materials and methods

2.1 Study design and enrollment procedure

This study was a survey study in which the relationship between the choice of delivery method and sexual satisfaction of women was investigated. In this study, we recruited women who had already delivered a baby by vaginal birth or C/S. We evaluated sexual function via the Golombok-Rust Inventory of Sexual Satisfaction (GRISS) and examined the influence of potential sexual dysfunction on the previous preference about the mode of delivery.

In this study, we enrolled women aged 18–45, who give first birth and preferred the delivery method with their own will. In Turkey, fears of women about their sexuality and genitalia are very common. Unlike western countries, vaginismus is a prevalent disorder. Also, women frequently have fears of childbirth. Due to these factors, C/S is preferred by some women without other medical criteria that necessitate

it. Women who had undergone C/S against their will or because of compelling medical indications and vaginal delivery with an intervention (forceps and vacuum) were excluded from the study. Also, patients with systemic diseases such as diabetes, hypertension, and patients with a known psychiatric condition and those using a drug for this condition were excluded from the study.

To reach more people, we used the author's Instagram account for volunteer participant enrollment. At the time of the enrollment, the number of followers was 13,433, almost 50% of whom were women. Ninety percent of the followers were residents of Istanbul, Turkey, and 86% were between the ages of 18 and 45.

First, the author's Instagram followers were informed about the study. They were asked to participate in a study about the relationship between sexual dysfunction and the mode of delivery. E-mail addresses of those who wanted to participate were obtained. Consent forms about this study were sent to these e-mail addresses. We prepared a survey form using Google Forms to probe whether the potential participant had given birth previously and if they did, what was the delivery type (C/S or vaginal)? The rest of the questionnaire involved 28 questions of the GRISS. Links for this survey were sent to e-mail addresses of the participants who signed and returned the consent forms. The collected data was transferred to the statistician for analysis. Among 259 collected forms, 69 were excluded because they did not meet the study criteria.

2.2 Evaluation of sexual satisfaction

The Golombok-Rust Inventory of Sexual Satisfaction (GRISS) was used to evaluate the sexual dysfunction of the study participants. The GRISS, developed by Rust and Golombok, is composed of 28 items to assess the presence and severity of sexual problems in heterosexual couples [10]. The studies for the validity and reliability of a Turkish version of GRISS were carried out by Tugrul *et al.* [11]. We used the female version of GRISS. The questions were five-point Likert type, with answers ranging from "never" to "always". The questionnaire provides a raw score between 28 and 140, where higher scores indicate more severe sexual dysfunction. GRISS also provides scores for seven subscales, including infrequency, non-communication, dissatisfaction, avoidance, non-sensuality, vaginismus, and anorgasmia. Cronbach's alpha values were 0.962 for the whole scale, 0.495 for infrequency, 0.779 for non-communication, 0.905 for non-sensuality, 0.847 for avoidance, 0.913 for dissatisfaction, 0.692 for vaginismus, and 0.913 for anorgasmia, which indicated high reliability.

2.3 Participants and data collection

Within 24 hours of initial sharing, the history involving the questionnaire was viewed by 1569 people, 501 people clicked the link, and 259 completed the questionnaire. At the 24th hour, the data collection phase was ended. The data was collected in the Google tables that were formed in association

with the Google questionnaire form. Sixty-nine participants were excluded because of incomplete data.

2.4 Statistical analysis

The NCSS (Number Cruncher Statistical System, version 2007, Kaysville, UT, USA) software was used for the analysis. In evaluating the data, descriptive statistical methods (mean, standard deviation, median, frequency, percent, minimum, maximum) were used. The Kolmogorov-Smirnov and the Shapiro-Wilk tests and graphical methods were used to check the numerical variables' distribution. For the two-group comparisons of normally distributed numerical variables, Student's *t*-test was used. The Mann-Whitney U test was used when the numerical variables were not normally distributed. In comparing more than two groups whose variables were not normally distributed, the Kruskal-Wallis test was used. Post-hoc binary comparisons were performed with the Bonferroni-Dunn test. In the comparison of the categorical variables, the Pearson chi-square test was used. Statistical significance was accepted when a *p*-value < 0.05 was obtained.

3. Results

3.1 Demographic features

Overall, the number of participants included in the analysis was 190. The median age was 30 years (range: 19–45 years). Half of the study subjects were aged between 26 and 30 years. The majority of the participants (62.6%) had a university or postgraduate degree. While 86 participants (45.3%) had VD, 104 participants (54.7%) underwent cesarean delivery. The demographic features of the participants are shown in Table 1. Participants who underwent C/S were significantly older compared with participants who had VD. Forty-six percent of the C/S group were over 30 years compared to only 31% of the VD group. Education levels also differed significantly between the delivery method groups. While primary and secondary school degrees were more common among the VD group, higher education levels were significantly more common among the C/S group (Table 1).

3.2 The GRISS scores

The stanine scores of the GRISS subscales are shown in Table 2. The highest and lowest mean scores were observed in the dissatisfaction and the anorgasmia subscales, respectively. In total, 115 participants (60.5%) stated that they did not have a problem regarding reaching orgasm. Ninety-six participants (50.5%) revealed that they avoid having sex with their partners, the level of sensuality in both their physical and sexual relationships was not sufficient, and the frequency of sexual intercourse was not high enough.

3.3 The GRISS scores according to the type of delivery method

When we compared the subscale scores, none of the mean subscale scores were significantly different between the groups (Table 3). Overall scores were also similar in both groups.

Table 1. Demographic characteristics of the participants.

		Total N (%)	C/S (n = 104)	VD (n = 86)	p-value
	Min–Max (Median)	19–45 (30)	19–45 (30)	19–40 (29)	0.041 ^b
	Mean ± SD	29.81 ± 3.77			
Age (years)	≤25	19 (10.0)	8 (7.7)	11 (12.8)	
	26–30	96 (50.5)	48 (46.2)	48 (55.8)	
	>30	75 (39.5)	48 (46.2)	27 (31.4)	
	Primary school	23 (12.1)	0 (0)	23 (26.7)	0.001 ^a
Education	Secondary school	48 (25.3)	7 (6.7)	41 (47.7)	
	University	59 (31.0)	38 (36.5)	21 (24.4)	
	Postgraduate	60 (31.6)	59 (56.8)	1 (1.2)	
	0–2000	28 (14.7)	5 (4.8)	23 (26.7)	
Income (TL/month)	2000–3000	56 (29.5)	14 (13.5)	42 (48.8)	
	3000–4000	50 (26.3)	37 (35.6)	13 (15.1)	0.001 ^a
	4000–5000	36 (18.9)	31 (29.8)	5 (5.8)	
	>5000	20 (10.5)	17 (16.3)	3 (3.5)	
Type of delivery	C/S	104 (54.7)			
	VD	86 (45.3)			

SD, standard deviation; C/S, cesarean section; VD, vaginal delivery; TL, Turkish lira.

^aPearson chi-squared test. ^bStudent's *t*-test.

Table 2. Stanine scores of GRISS subscale in the whole study group.

	Min–Max (Median)	Mean ± SD	Disorder	
			Absent	Present
Infrequency	1–9 (4)	4.39 ± 1.87	96 (50.5)	94 (49.5)
Non-communication	1–9 (5)	4.73 ± 2.40	89 (46.8)	101 (53.2)
Non-sensuality	1–9 (4)	4.56 ± 2.26	96 (50.5)	94 (49.5)
Avoidance	1–9 (4)	4.26 ± 2.08	96 (50.5)	94 (49.5)
Dissatisfaction	1–9 (6)	5.96 ± 2.41	45 (23.7)	145 (76.3)
Vaginismus	1–9 (5)	5.23 ± 1.71	52 (27.4)	138 (72.6)
Anorgasmia	1–9 (4)	4.12 ± 1.90	115 (60.5)	75 (39.5)
Overall score	1–9 (5)	5.36 ± 2.92	75 (39.5)	115 (60.5)

SD, standard deviation.

Table 3. Comparison of groups for overall GRISS score and subscale scores.

		Type of delivery		p-value ^a
		C/S (n = 104)	VD (n = 86)	
Infrequency	Min–Max (Median)	1–9 (5)	1–9 (4)	0.206
	Mean ± SD	4.55 ± 1.89	4.20 ± 1.83	
Non-communication	Min–Max (Median)	1–9 (5)	1–9 (4.5)	0.534
	Mean ± SD	4.83 ± 2.43	4.60 ± 2.37	
Non-sensuality	Min–Max (Median)	1–9 (5)	1–9 (4)	0.235
	Mean ± SD	4.74 ± 2.24	4.34 ± 2.27	
Avoidance	Min–Max (Median)	1–9 (4)	1–9 (5)	0.910
	Mean ± SD	4.26 ± 2.10	4.27 ± 2.07	
Dissatisfaction	Min–Max (Median)	1–9 (6.5)	1–9 (6)	0.331
	Mean ± SD	6.09 ± 2.43	5.81 ± 2.40	
Vaginismus	Min–Max (Median)	1–9 (5)	1–9 (5)	0.149
	Mean ± SD	5.39 ± 1.63	5.02 ± 1.80	
Anorgasmia	Min–Max (Median)	1–9 (4)	1–8 (4)	0.423
	Mean ± SD	4.22 ± 1.94	3.99 ± 1.86	
Overall score	Min–Max (Median)	1–9 (6)	1–9 (5)	0.314
	Mean ± SD	5.55 ± 2.94	5.14 ± 2.89	

SD, standard deviation; C/S, cesarean section; VD, vaginal delivery.

^aMann Whitney U test.

Table 4. Evaluation of the GRISS questions according to the type of delivery.

		Type of delivery method		<i>p</i> -value ^a
		CS (n = 104)	VD (n = 86)	
Q1. Do you feel uninterested in sex?	Min–Max (Median)	0–4 (2)	0–4 (2)	0.362
	Mean ± SD	1.73 ± 0.99	1.58 ± 0.99	
Q2. Do you ask your partner what he likes or dislikes about your sexual relationship?	Min–Max (Median)	0–4 (2)	0–4 (2)	0.434
	Mean ± SD	2.12 ± 1.32	1.97 ± 1.33	
Q3. Are there weeks in which you don't have sex at all?	Min–Max (Median)	0–4 (1)	0–4 (1)	0.264
	Mean ± SD	1.40 ± 0.95	1.23 ± 0.93	
Q4. Do you become easily sexually aroused?	Min–Max (Median)	0–4 (2)	0–4 (2)	0.352
	Mean ± SD	2.14 ± 1.33	1.97 ± 1.33	
Q5. Are you satisfied by the amount of time you and your partner spend on foreplay?	Min–Max (Median)	0–4 (2)	0–4 (2)	0.352
	Mean ± SD	2.14 ± 1.33	1.97 ± 1.33	
Q6. Do you find that your vagina is so tight that your partner's penis cannot enter it?	Min–Max (Median)	0–4 (0)	0–4 (0)	0.368
	Mean ± SD	0.68 ± 1.00	0.63 ± 1.07	
Q7. Do you try to avoid having sex with your partner?	Min–Max (Median)	0–4 (1)	0–3 (1)	0.864
	Mean ± SD	1.16 ± 1.08	1.16 ± 0.99	
Q8. Are you able to experience an orgasm with your partner?	Min–Max (Median)	0–4 (2)	0–4 (2)	0.352
	Mean ± SD	2.14 ± 1.33	1.97 ± 1.33	
Q9. Do you enjoy cuddling and caressing your partner's body?	Min–Max (Median)	0–4 (2)	0–4 (2)	0.352
	Mean ± SD	2.14 ± 1.33	1.97 ± 1.33	
Q10. Do you find your sexual relationship with your partner satisfactory?	Min–Max (Median)	0–4 (2)	0–4 (2)	0.352
	Mean ± SD	2.14 ± 1.33	1.97 ± 1.33	
Q11. Is it possible to insert your finger in your vagina without discomfort?	Min–Max (Median)	0–4 (4)	0–4 (3)	0.024*
	Mean ± SD	3.29 ± 1.11	2.87 ± 1.33	
Q12. Do you dislike stroking and caressing your partner's penis?	Min–Max (Median)	0–4 (1)	0–3 (1)	0.864
	Mean ± SD	1.16 ± 1.08	1.16 ± 0.99	
Q13. Do you become tense and anxious when your partner wants to have sex?	Min–Max (Median)	0–4 (0.5)	0–3 (1)	0.878
	Mean ± SD	0.87 ± 1.03	0.80 ± 0.92	
Q14. Do you find it impossible to have an orgasm?	Min–Max (Median)	0–4 (1)	0–3 (1)	0.864
	Mean ± SD	1.16 ± 1.08	1.16 ± 0.99	
Q15. Do you have sexual intercourse more than twice a week?	Min–Max (Median)	0–4 (2)	0–4 (2)	0.352
	Mean ± SD	2.14 ± 1.33	1.97 ± 1.33	

Table 4. Continued.

		Type of delivery method		<i>p</i> -value ^a
		CS (n = 104)	VD (n = 86)	
Q16. Do you find it hard to tell your partner what you like and dislike about your sexual relationship?	Min–Max (Median)	0–4 (2)	0–4 (1)	0.659
	Mean ± SD	1.71 ± 1.32	1.64 ± 1.34	
Q17. Is it possible for your partner's penis to enter your vagina without discomfort?	Min–Max (Median)	0–4 (1)	0–4 (1)	0.408
	Mean ± SD	1.15 ± 1.09	1.00 ± 0.98	
Q18. Do you feel there is a lack of love and affection in your sexual relationship with your partner?	Min–Max (Median)	0–4 (1)	0–4 (1)	0.264
	Mean ± SD	1.40 ± 0.95	1.23 ± 0.93	
Q19. Do you enjoy having your genitals stroked and caressed by your partner?	Min–Max (Median)	0–4 (2)	0–4 (2)	0.352
	Mean ± SD	2.14 ± 1.33	1.97 ± 1.33	
Q20. Do you refuse to have sex with your partner?	Min–Max (Median)	0–4 (1)	0–4 (1)	0.264
	Mean ± SD	1.40 ± 0.95	1.23 ± 0.93	
Q21. Can you reach orgasm when your partner stimulates your clitoris during foreplay?	Min–Max (Median)	0–4 (2)	0–4 (2)	0.352
	Mean ± SD	2.14 ± 1.33	1.97 ± 1.33	
Q22. Do you feel dissatisfied with the amount of time your partner spends on intercourse itself?	Min–Max (Median)	0–4 (2)	0–4 (2)	0.352
	Mean ± SD	2.14 ± 1.33	1.97 ± 1.33	
Q23. Do you have feelings of disgust about what you do during lovemaking?	Min–Max (Median)	0–4 (0)	0–4 (0)	0.427
	Mean ± SD	0.69 ± 0.99	0.77 ± 0.95	
Q24. Do you find that your vagina is rather tight so that your partner's penis can't penetrate very far?	Min–Max (Median)	0–4 (0)	0–4 (0)	0.639
	Mean ± SD	0.67 ± 1.01	0.62 ± 1.02	
Q25. Do you dislike being cuddled and caressed by your partner?	Min–Max (Median)	0–4 (2)	0–4 (2)	0.352
	Mean ± SD	2.14 ± 1.33	1.97 ± 1.33	
Q26. Does your vagina become moist during lovemaking?	Min–Max (Median)	0–4 (2)	0–4 (2)	0.352
	Mean ± SD	2.14 ± 1.33	1.97 ± 1.33	
Q27. Do you enjoy having sexual intercourse with your partner?	Min–Max (Median)	0–4 (2)	0–4 (2)	0.352
	Mean ± SD	2.14 ± 1.33	1.97 ± 1.33	
Q28. Do you fail to reach orgasm during intercourse?	Min–Max (Median)	0–4 (2)	0–4 (2)	0.352
	Mean ± SD	2.14 ± 1.33	1.97 ± 1.33	

Q, question; SD, standard deviation; C/S, cesarean section; VD, vaginal delivery.

^a: Mann Whitney U Test.

*: $p < 0.05$.

We also compared the responses to the 28 questions of the GRISS. Again, none of the responses, except that for question 11, showed a significant difference between the groups. Question 11 asked, "Is it possible to insert your finger in your vagina without discomfort?". There was a significant difference between the two groups regarding their responses to this question (median scores were 4 in the C/S group and 3 in the VD group) (Table 4). Table 3 summarizes the responses to 28 GRISS questions in the VD and C/S groups.

4. Discussion

This study was a survey study that aimed to evaluate any probable effect of sexual dysfunction on the women's preference for the mode of delivery. The study's primary finding was that sexual dysfunction that was evaluated with GRISS was not a determinant of their preference for the mode of delivery. Significant differences between the women who had VD or C/S were observed only in one response, the item that questioned the discomfort associated with the act of inserting one's finger into her vagina. Participants who opted for VD had significantly lower scores in this item compared with participants who preferred C/S. Psychological factors underlying the preferences about the mode of delivery have been investigated in previous studies. Kjerulff *et al.* [12] found that being depressed during pregnancy and fear of childbirth increased the odds of preferring C/S. Gamble and Creedy [13] found that anxious women were more likely to prefer C/S. Although not evaluated previously, women who fear inserting a finger into the vagina may be more anxious and fearful, which caused their avoidance of VD.

The rate of C/S delivery has steadily increased in Turkey in the last decades. Cagan *et al.* [14] evaluated the rate of C/S delivery in a leading tertiary care university hospital in Turkey and found that the rate was only 11.4% in 1976 and increased to 77.9% in 2016. One would expect, more modest rates in community hospitals. And this trend is more or less the same in various parts of the world [7, 15–17]. The majority of C/S operations in the United States are performed due to compelling medical indications. A large study reported that 47.1% and 27.1% of the C/S operations were performed because of labor dystocia and non-reassuring fetal heart rates, respectively [18]. Another important cause of C/S (4–15%) was the maternal request [19].

Both C/S and VD are associated with maternal and fetal complications. Although several studies compared the risks and benefits of these two modes of delivery, there is still controversy regarding which method to choose in some situations [1]. Thus, in favor of VD, the World Health Organization recommended the rate of C/S not exceeding 15% [2]. Since one cannot reduce the rate of C/S due to medical indications, the most feasible ones to reduce are VD after cesarean (VDAC) and CS on maternal request in nulliparous women. Numerous studies investigated which factors motivate women to opt for C/S [20–24]. The driving forces and causes of C/S are several and vary from country to country

and from culture to culture [25, 26]. It is important to understand the influencing factors to curb the increase in C/S rates more efficiently.

Sexual dysfunction after cesarean delivery has been studied relatively well. It is plausible to think that cesarean delivery would be more advantageous in terms of postpartum sexual function compared with VD because it is not associated with perineal injury. In contrast to this expectation, most studies [27–30] did not find a difference between cesarean delivery and VD in terms of postpartum sexual dysfunction.

On the other hand, we could not find any study examining the effects (if any) of sexual dysfunction on women's preference for the mode of delivery. We hypothesized that sexual dysfunction might cause some fears and prejudices against vaginal birth. The only difference between the modes of delivery was that fewer participants among those who had VD reported that they could insert their finger into their vagina without discomfort compared with the participants who underwent a C/S operation. This difference might reflect that patients who hesitated or did not feel comfortable inserting their finger into their vagina might have preferred C/S more commonly since this is a method that has nothing to do with the genital area. This interesting finding should be investigated further.

In our daily practice, we usually observe that pregnant women pay more attention than warranted to the opinions of their mothers, spouses, mothers-in-law, and friends when they decide the mode of delivery. As a result of these inculcations at the beginning of the pregnancy, many women declare that they would prefer VD. Even pregnant women with vaginismus disguise this condition, and consequently, after the start of the delivery, they change their opinion, or their doctor directs them to C/S. Manipulation of the vagina via the passage of the fetus, episiotomy, and sutures along with the pain might influence a women's decision regarding the mode of delivery. Thus, women's genuine feelings and decisions regarding delivery mode without any coercion from the family and friends would provide a better decision-making process for both the women and the medical staff. A survey form may help to understand women's opinions on this subject.

One of the shortcomings of our approach was that we did not perform a prospective study. We didn't know whether these women had sexual dysfunction before their pregnancy. We could only search for their records from the electronic database of the Ministry of Health, but this database is not all-inclusive. In a further study, we can evaluate sexual dysfunction on birth preference before and after delivery. Instead, we evaluated sexual dysfunction in women who already gave birth either with C/S or VD. Thus, the mode of delivery might have affected the sexual function of the participants. However, several studies showed that the mode of delivery did not have a considerable effect on women's sexual functioning. One other consideration is related to our recruitment method. We effectively used social media to recruit

volunteers who wished to participate in the study. The recruitment model might have caused a bias towards the inclusion of more extroverted women who did not hesitate to register in such a study that evaluated sexual function. Because of this fact, our cohort might not reflect the situation in a specific region and be insufficient to generalize. Also, we had to receive informed consent forms by e-mail. Most of these limitations are due to the effects of the pandemic which forced us to minimize face-to-face contact with our study participants. Despite these limitations, ours is the first study to answer whether sexual dysfunction affects the preference for the mode of delivery.

5. Conclusions

In conclusion, in the current study with a novel social media recruitment method, we showed that sexual dysfunction did not have any association with the selection of delivery mode among the participants. However, we found that patients who had VD were less likely to feel discomfort when they insert their fingers into their vaginas. Further research is needed to elucidate the issue more clearly.

Abbreviations

VD, Vaginal delivery; C/S, cesarean section; GRISS, Golombok-Rust Inventory of Sexual Satisfaction; NCSS, Number Cruncher Statistical System; SD, standard deviation; TL, Turkish Lira; Q, question.

Author contributions

EA conceived, designed, performed the research and wrote the paper; SŞA edited the manuscript. All author read and approved the final manuscript.

Ethics approval and consent to participate

The participants were informed about the procedures, and their informed consent was obtained before the procedures. The study was conducted in accordance with the Declaration of Helsinki, and the protocol was approved by the local ethics committee at İstanbul Gelişim University (Dated 1 October 2020, Approval # 5 July 2020).

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Conflict of interest

The authors declare no conflict of interest.

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