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ORIGINAL RESEARCH

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Cervical conization in women of reproductive age from patient's perspective: how much do we know?

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Abstract

Background: Surgical procedures involving the female reproductive system significantly influence the lives of women, particularly those within the reproductive age bracket. There exists a paucity of data regarding the personal distress associated with cervical conization among women of reproductive age. The objective of our investigation was to evaluate the effects of surgical intervention for cervical dysplasia in this demographic, with a specific focus on acute perioperative stress. **Methods**: We conducted a cross-sectional study, engaging in interviews with 135 patients during their postoperative follow-ups after cervical conization. Participants supplied sociodemographic and medical histories while completing Beck's anxiety and depression inventories. **Results**: Among the 135 patients surveyed, 27 (20.0%) reported no stress related to the conization procedure. The most prevalent concern was the fear of disease progression into malignancy (observed in 39.3% of cases), succeeded by apprehension regarding potential fertility impairment (14.8%). In 25.93% of instances, women expressed stress related to additional factors, general anesthesia (16 patients), postoperative pain (10 patients), and perioperative complications (4 patients). The median anxiety score of 7.5 was found to be highest among women who expressed worries about future fertility, whereas the median depression score of 2 was the lowest in this same cohort. **Conclusions**: The results of our research indicate that fears surrounding disease progression and concerns regarding fertility impairment constitute significant perioperative anxieties for women of reproductive age. Further investigations into psychological stressors and the necessity for postoperative psychological support for women of reproductive age undergoing conization are warranted.

Keywords

Cervical conization; Cervical dysplasia; Psychological stressors; Perioperative stress; Anxiety score; Stress related disease; Fertility impairment; Reproductive age

1. Introduction

Any surgical intervention on female genital organs has a high psychological impact on women of reproductive age [1]. There is a wide spectrum of fears among surgical patients which include: fear of surgical complications, fear linked to the duration and degree of disability after the surgery, concerns about general anesthesia and the associated loss of control, and fear of the discomfort and pain during and/or after surgery [2, 3]. Preoperative anxiety and consequently psychological distress are related to poor postoperative pain control and increased morbidity with harmful implications both clinically and economically [2, 3].

Implementation of cervical cancer screening has led to decreased morbidity of cervical cancer, and an increasing number of women diagnosed with cervical preinvasive disease [4]. Currently, the incidence of preinvasive cervical lesions is increasing worldwide, particularly in reproductive-age women [5]. Affected women are facing both oncological and obstetrical risks, issues of sexual transmission of the disease, as well as social unacceptance of disease transmission. Little is known about women treated for preinvasive diseases, despite a large body of research on the health-related quality of life (HR-QoL) in patients undergoing fertility-sparing surgery for invasive diseases. Despite not being life-threatening, these illnesses may impair women's emotional and physical health. In addition to the condition itself, post-operative issues related to infertility, obstetric and neonatal morbidity also have an impact on these women's long-term outcomes [6]. The data on personal distress caused by cervical excision during the reproductive period have not widely investigated in the literature yet.

By evaluating women long time after the procedure, the presented study intent to gain insight into psychological responses to surgical therapy for cervical dysplasia in women of reproductive age, unfiltered by acute perioperative stress and

frequent immediate postoperative follow-up. We think that this kind of information could be helpful for medical professionals who are treating and monitoring these women to make sure they get the proper psychological support and assistance during perioperative period and later.

2. Materials and methods

The authors conducted a cross-sectional study in a single referral University affiliated hospital, from April 2014 to October 2016. Before the patient's enrollment Ethics Committee approval was obtained. Inclusion criteria were as following: age from 18 to 45 years, histologically confirmed squamous intraepithelial lesion of the cervix (either low or high grade), treatment by cervical excision: large loop excision of the transformation zone (LLETZ) or cold knife conization (CKC) two or more years before the interview, Serbian native speaker, thus eligible to fully understand the questions asked during the interview. Exclusion criteria were pregnancy, menopausal status, histologically diagnosed invasive cervical cancer or any other malignancy, re-excision, presence of any major gynecological disease, referral for abnormal cytology and/or colposcopy, any other surgery on reproductive organs except cesarean section (CS), any psychiatric, neurological or another major disease possibly influencing HR-QoL and/or psychological status of the participants and missing relevant data. All patients gave written informed consent for the study. All patients were interviewed by the principal investigator during regular postoperative follow-up exams.

For each patient, medical charts were examined for extraction of the clinical data. Patients were asked which was the major stress they had regarding surgery, if they have had difficulty telling their partner about the disease, and if their sexual interest is the same as it was at the time of surgery. Data about smoking status, marital status and barrier contraception use were also collected. After the interview, and before the exam, all patients filled on both Beck's anxiety and Beck's depression inventory. Based on the answers on the greatest stress they had about the conization, a total of 135 patients were divided into four groups: (A) 27 patients who were not distressed by conization at all; (B) 53 patients who were worried about the progression of the disease into invasive cancer; (C) 20 patients who were worried for future fertility; (D) 35 patients worried about other issues (use of general anesthesia, postoperative pain, immediate perioperative complications, family issues during the treatment). Statistical evaluation was performed by using the SPSS 17 software (IBM, Chicago, IL, USA), with a significance level set at $p \leq 0.05$.

3. Results

Out of a total of 135 patients, 27 (20.0%) did not claim any stress related to conization. The most frequent one was fear of disease progression into malignancy (in 39.3% of the cases), followed by fear of impaired fertility (14.8%). In 25.9% of the cases, women were stressed about other issues (group D), mostly use of general anesthesia (16 patients), postoperative pain (10 patients), and perioperative complications (4 patients). The mean age of the study population at the time of interview was 35.09 $\pm$ 5.44 (range 22–44), and 30.39 $\pm$ 5.21 (range 19–41) at the time of the surgery. Patients were youngest in group C reporting dominant concerns over future fertility without statistically significant difference. The period after the conization ranged from 2 to 18 years, with a median of 4 years in all groups, except group B in which it was 5 years. Regarding previous deliveries at the time of the interview, groups exhibited significant differences, as only 10% in group C reported delivery before the interview. Considering the history of abortions there was no significant difference between the groups. Data collected regarding sociodemographic features, as well as obstetric history are reported in Table 1. A summary of patients' perioperative clinical and sociodemographic data is presented in Table 2.

There were no significant differences between the groups concerning indications and kind of excision, final specimen histology and surgeon's experience, barrier contraception use, and marital status at the time of surgery. The preoperative grade of the dysplasia was also not different between the groups (data not shown, $p = 0.308$). Nevertheless, groups exhibited highly significant differences in relation to preoperative deliveries, fertility interest at the time of surgery, and smoking at the time of surgery. Patients in group C were parous in only 10% of the cases, consequently, they were interested in future reproduction in 100% of cases, and 30% of them were smokers in contrast to all other groups with smoking ranging from 63.0 to 71.4%. Regarding the question if they have had difficulty telling their partner about the disease patients in groups A and D less frequently have had such issues when compared to other groups. Noteworthy, one patient in group A had difficulty telling her partner about the disease. In terms of postoperative data, groups were not different regarding all the investigated data, only abnormal postoperative Papanicolau (PAP) smears were more frequent in group C. Fertility interest at the time of the interview was close to the level of statistical significance ($p = 0.0501$). More than half of all patients were still interested in childbearing, most frequently in group C (80.0%) *vs*. 45.3% in group B. A total of 29.6% of women expressed less interest in sex after the treatment, and 27.4% reported unpleasantness during follow-up colposcopy examination. Data are shown in Table 3.

4. Discussion

Plentiful variables have been examined as potential indicators of disease recurrence after conization; however, there exists a deficiency in the literature concerning the psychological and psychosocial ramifications of the treatment. The presence of effective coping strategies and adequate social support systems is crucial for achieving a favorable health outcome subsequently any therapeutic intervention. Individualized concerns may possess comparable importance, as empirical evidence has demonstrated that psychological distress and coping strategies can influence the pathophysiology of cervical neoplasia by modulating the immune system's response to human papillomavirus (HPV) infection [6]. Identifying potential stressors may enhance women's psychosocial functioning and overall well-being, which could mitigate the long-term sequelae associated with cervical dysplasia and the impairment of health-

TABLE 1. Patients' baseline data at the time of the interview.

Characteristic	Total N = 135	Group A N = 27	Group B N = 53	Group C N = 20	Group D N = 35	*p*
Age (yr), mean ± SD	35.1 ± 5.4	34.7 ± 6.7	36.3 ± 4.9	33.6 ± 5.2	34.4 ± 5.1	0.187[a]
Age at surgery (yr) mean ± SD	30.4 ± 5.2	30.0 ± 6.5	31.2 ± 4.9	29.6 ± 4.8	29.8 ± 4.7	0.506[a]
Years after the surgery, median (range)	4 (2–18)	4 (2–18)	5 (2–15)	4 (2–8)	4 (2–11)	0.781[b]
Menarche (yr), mean ± SD	13.1 ± 1.7	13.3 ± 1.8	13.0 ± 1.8	13.1 ± 1.4	13.2 ± 1.6	0.907[a]
Abortions, n (%)						
No	102 (75.6)	18 (66.7)	36 (67.9)	18 (90.0)	30 (85.7)	0.071[d]
Yes	33 (24.4)	9 (33.3)	17 (32.1)	2 (10.0)	5 (14.1)	
Deliveries, n (%)						
No	74 (54.8)	14 (51.9)	23 (43.4)	18 (90.0)	19 (54.3)	0.005[c]
Yes	61 (45.2)	13 (48.1)	30 (56.6)	2 (10.0)	16 (45.7)	
BMI (kg/m^2), mean ± SD	22.2 ± 2.9	22.0 ± 2.6	22.4 ± 2.7	21.7 ± 2.6	22.4 ± 3.6	0.779[a]
Actual marital status, n (%)						
Married/coupled	86 (63.7)	16 (59.3)	35 (66.0)	12 (60.0)	23 (65.7)	0.911[c]
Single/divorced	49 (36.3)	11 (40.7)	18 (34.0)	8 (40.0)	12 (34.3)	
Education level, n (%)						
≤12 yr	69 (51.1)	17 (63.0)	23 (43.4)	9 (45.0)	20 (57.1)	0.309[c]
>12 yr	66 (48.9)	10 (37.0)	30 (56.6)	11 (55.0)	15 (42.9)	
Employment, n (%)						
No	24 (17.8)	5 (18.5)	11 (20.8)	3 (15.0)	5 (14.3)	0.894[d]
Yes	111 (82.2)	22 (81.5)	42 (79.3)	17 (85.0)	30 (85.7)	
Current barrier contraception use, n (%)						
No	83 (61.5)	16 (59.3)	31 (58.5)	14 (70.0)	22 (62.9)	0.826[c]
Yes	52 (38.5)	11 (40.7)	22 (41.5)	6 (30.0)	13 (37.1)	
Current smoker, n (%)						
No	50 (37.0)	10 (37.0)	18 (34.0)	14 (70.0)	8 (22.9)	0.006[c]
Yes	85 (63.0)	17 (63.0)	35 (66.0)	6 (30.0)	27 (77.1)	
Beck's anxiety inventory score, median (range)	6 (0–26)	6 (0–22)	6 (0–25)	7.5 (0–26)	4 (0–24)	0.649[b]
Beck's depression inventory score, median (range)	3 (0–39)	3 (0–15)	4 (0–20)	2 (0–39)	2 (0–11)	0.485[b]

[a]*One-way ANOVA;* [b]*Kruskal Wallis test;* [c]*Chi square test;* [d]*Fisher exact test. SD: standard deviation; BMI: Body mass index.*

TABLE 2. Patient's perioperative data.

Characteristic	Total N = 135	Group A N = 27	Group B N = 53	Group C N = 20	Group D N = 35	*p*
Preoperative abortions, n (%)						
No	102 (75.6)	18 (66.7)	36 (67.9)	18 (90.0)	30 (85.7)	0.071[c]
Yes	33 (24.4)	9 (33.3)	17 (32.1)	2 (10.0)	5 (14.3)	
Preoperative deliveries, n (%)						
No	74 (54.8)	14 (51.9)	23 (43.4)	18 (90.0)	19 (54.3)	0.005[c]
Yes	61 (45.2)	13 (48.1)	30 (56.6)	2 (10.0)	16 (45.7)	
Kind of indication, n (%)						
Colposcopy	9 (6.7)	1 (3.7)	4 (7.5)	1 (5.0)	3 (8.8)	
Cytology	50 (37.3)	11 (40.7)	19 (35.8)	7 (35.0)	13 (38.2)	0.993[d]
Histology	75 (56.0)	15 (55.6)	30 (56.6)	12 (60.0)	18 (52.9)	

TABLE 2. Continued.

Characteristic	Total N = 135	Group A N = 27	Group B N = 53	Group C N = 20	Group D N = 35	*p*
Kind of operation, n (%)						
LLETZ	93 (68.9)	20 (74.1)	35 (66.0)	17 (85.0)	21 (60.0)	0.235[c]
CKC	42 (31.3)	7 (25.9)	18 (34.3)	3 (15.0)	14 (44.0)	
Fertility interest at surgery, n (%)						
No	37 (27.4)	10 (37.0)	16 (30.2)	0 (0.0)	11 (31.4)	0.026[c]
Yes	98 (72.6)	17 (63.0)	37 (69.8)	20 (100.0)	24 (68.6)	
Experience of the surgeon (yr), median (range)	16 (1–33)	17 (1–29)	15 (1–31)	17.5 (6–26)	15 (2–33)	0.963[a]
Final histology, n (%)						
LSIL	35 (25.9)	6 (22.2)	12 (22.6)	6 (30.0)	11 (31.4)	0.749[c]
HSIL	100 (74.1)	21 (77.8)	41 (77.4)	14 (70.0)	24 (68.6)	
Barrier contraception use at the time of surgery, n (%)						
No	89 (65.9)	19 (70.4)	34 (64.2)	12 (60.0)	24 (68.6)	0.865[c]
Yes	46 (34.1)	8 (29.6)	19 (35.8)	8 (40.0)	11 (31.4)	
Smoking at the time of surgery, n (%)						
No	53 (39.3)	10 (37.0)	19 (35.8)	14 (70.0)	10 (28.6)	0.019[c]
Yes	82 (60.7)	17 (63.0)	34 (64.2)	6 (30.0)	25 (71.4)	
Difficulty telling partner*, n (%)						
No	113 (83.7)	26 (96.3)	40 (75.5)	15 (75.0)	32 (91.4)	0.038[c]
Yes	22 (16.3)	1 (3.7)	13 (24.5)	5 (25.0)	3 (8.6)	
Marital status at the time of surgery, n (%)						
Married	63 (46.7)	12 (44.4)	29 (54.7)	7 (35.0)	15 (42.9)	0.435[c]
Other	72 (53.3)	15 (55.6)	24 (45.3)	13 (65.0)	20 (57.1)	

**I have had difficulty telling my partner about the disease.*
[a]One-way ANOVA; [c]Chi-square test; [d]Fischer exact test.
LLETZ: large loop excision of the transformation zone; CKC: cold knife conization; LSIL: low-grade squamous intraepithelial lesion; HSIL: high-grade squamous intraepithelial lesion.

TABLE 3. Patient's postoperative data.

Characteristic	Total N = 135	Group A N = 27	Group B N = 53	Group C N = 20	Group D N = 35	*p*
Menstrual cycle change, n (%)						
No	87 (64.4)	16 (59.3)	31 (58.5)	14 (70.0)	26 (74.3)	0.410[c]
Yes	48 (35.6)	11 (40.7)	22 (41.5)	6 (30.0)	9 (25.9)	
Abnormal cytology after the surgery, n (%)						
No	104 (77.0)	21 (77.8)	47 (88.7)	12 (60.0)	24 (69.6)	0.033[c]
Yes	31 (23.0)	6 (22.2)	6 (11.3)	8 (40.0)	11 (31.4)	
Diagnostic interventions after the surgery, n (%)						
No	121 (89.6)	26 (96.3)	49 (92.5)	15 (75.0)	31 (88.6)	0.117[d]
Yes	14 (10.4)	1 (3.7)	4 (7.5)	5 (25.0)	4 (11.4)	
Unpleasantness during colposcopy, n (%)						
No	98 (72.6)	17 (63.0)	41 (77.4)	15 (75.0)	25 (71.4)	0.584[c]
Yes	37 (27.4)	10 (37.0)	12 (22.6)	5 (25.0)	10 (28.6)	
Postoperative infertility, n (%)						
No	117 (86.7)	25 (92.6)	46 (86.8)	16 (80.0)	30 (85.7)	0.638[d]
Yes	18 (13.3)	2 (7.4)	7 (13.2)	4 (20.0)	5 (14.3)	

TABLE 3. Continued.

Characteristic	Total N = 135	Group A N = 27	Group B N = 53	Group C N = 20	Group D N = 35	*p*
Postoperative ART, n (%)						
No	127 (92.4)	26 (96.3)	49 (92.5)	18 (90.0)	31 (97.1)	0.657[d]
Yes	8 (5.9)	1 (3.7)	4 (7.5)	2 (10.0)	1 (2.9)	
Current interest in fertility, n (%)						
No	57 (42.2)	10 (37.0)	29 (54.7)	4 (20.0)	14 (40.0)	0.050[c]
Yes	78 (57.8)	17 (63.0)	24 (45.3)	16 (80.0)	21 (60.0)	
Marital status change after the surgery, n (%)						
No	99 (73.3)	23 (85.2)	40 (75.5)	15 (75.0)	21 (60.0)	0.153[c]
Yes	36 (26.7)	4 (14.8)	13 (24.5)	5 (25.0)	14 (40.0)	
Barrier contraception use change, n (%)						
No	113 (83.4)	24 (88.9)	46 (86.8)	18 (90.0)	25 (71.4)	0.197[d]
Yes	22 (16.3)	3 (11.1)	7 (13.2)	2 (10.0)	10 (28.6)	
Interest in sex after the surgery, n (%)						
Same	95 (70.4)	17 (63.0)	37 (69.8)	14 (70.0)	27 (77.1)	0.685[c]
Less	40 (29.6)	10 (37.0)	16 (30.2)	6 (30.0)	8 (22.9)	
Postoperative deliveries, n (%)						
No	103 (76.3)	24 (88.9)	40 (75.5)	12 (60.0)	27 (77.1)	0.149[c]
Yes	32 (23.7)	3 (11.1)	13 (24.5)	8 (40.0)	8 (22.9)	

[c]Chi-square test; [d]Fischer exact test. ART: assisted reproductive technology.

related quality of life (HR-QoL).

It poses a significant challenge to juxtapose our findings with extant literature, given the scarcity of relevant studies due to divergent study designs and methodologies employed, as well as the heterogeneity of assessed outcomes. To the best of our understanding, no prior investigations have specifically examined patients several years succeeding the conization procedure. Furthermore, none of the antecedent studies has concentrated exclusively on women of reproductive age, who constitute a particularly susceptible demographic within any society. The rationale for our focus on this population lies in the fact that fertility-related concerns cannot be address in older women, while anxiety regarding cancer may persist irrespective of age. Our research elucidated that woman who have undergone conization may display either an absence of concerns or exhibit considerable anxiety, encompassing fears related to the potential progression to cervical cancer, apprehensions about future fertility, or other pertinent issues.

Among the female cohort that did not demonstrate emotional distress concerning the pathology and its associated interventions, approximately 48% had given birth previously, 33.3% had undergone abortions prior to the surgical interventions, and the majority possessed an educational attainment of up to 12 years. A considerable segment did not utilize barrier methods of contraception at the time of the surgical procedures (70.4%) and indicated no challenges in disclosing their diagnosis to their partners. Furthermore, 85.2% of these women preserved their marital status after the surgical operations, and up to 88.9% did not modify their contraceptive behaviors. It is significant to note that, despite a considerable inclination towards future fertility articulated by 63.0%, only 11.1% ultimately realized childbirth. The aforementioned findings imply that these women predominantly exhibit lower educational level, are engaged in long-term partnerships, and, despite articulating reproductive aspirations during the treatment phase, largely did not undergo alterations in their familial circumstances after treatment, as demonstrated by the 88.9% who did not experience subsequent childbirth.

Women demonstrating apprehensions related to cancer progression were typically of an advanced age at both the time of surgical intervention and during the interview process and exhibited a greater likelihood of presenting depressive symptoms. Although their depression scores remained within acceptable parameters, the median score on the Beck Depression Inventory (BDI) was significantly higher within this specific subgroup. A substantial proportion of these women were smokers at the time of surgical procedure (64.2%) and were predominantly either married or in committed partnerships. The prevalence of abnormal cytological findings was markedly lower in this subgroup (merely 11.3%), indicating that the concerns articulated were not influenced by subsequent anxieties regarding disease recurrence. In contrast to group A, this subgroup experienced postoperative deliveries in 24.5% of instances. Majority of these women (63.0%) had attained up to 12 years of education, corroborating findings published by Le Mortensen and Adler [7], which indicated that the fear

of cancer among women diagnosed with cervical dysplasia is primarily influenced by their level of understanding regarding their medical condition.

To identify predictors of the fear of cancer recurrence, Hanprasertpong *et al*. [8] employed the Hospital Anxiety and Depression Scale (HADS), the Functional Assessment of Cancer Therapy-Cervical (FACT-Cx) questionnaire, and the short version of the Fear of Progression Questionnaire (FoP-Q-SF). The three biggest anxieties, according to the FoP-Q-SF, were fearing for their family's future, being terrified of pain, and fearing that their illness would worsen. The authors found that the only conditions that were independently linked to a significant fear of cancer recurrence were low HR-QoL and anxiety disorders [8].

The group of women facing fertility issues constitutes the youngest demographic within the research, exhibiting a markedly low prevalence of parous women (merely 10.0%) and an equally low incidence of smokers (30.0%). Each participant expressed a desire for further reproductive opportunities, with the majority being either single or divorced.

Throughout the entire sample, this group showed the highest levels of anxiousness, even though we could not measure statistical significance. Given that our review was limited to people who are reproductive age, the results obtained from this subgroup clearly indicate that young, nulliparous women who have not yet fulfilled their family goals constitute a vulnerable population that may benefit from appropriate psychological support both prior to and following surgical procedures.

Prior investigations have also indicated that women of childbearing age diagnosed with cervical dysplasia form a distinct subpopulation necessitating a particularly sensitive approach from healthcare professionals [9]. The literature corroborates those younger patients with aspirations for fertility experience heightened distress because of a cervical dysplasia diagnosis [10].

Patients preoccupied with alternative issues comprise a heterogeneous collective. It is particularly significant that the prevalence of smoking among these women was 71.4% at the time of treatment, while their smoking status at the time of interview rose to 77.1%. Their concerns varied widely, ranging from apprehension regarding anesthesia to familial apprehensions. These demographic underscores the imperative for further research aimed at elucidating the diverse concerns encountered by women of reproductive age during cervical dysplasia treatment, thereby enabling the provision of appropriate preparatory information to alleviate the distress associated with such medical interventions.

In the end, it is important to remember that none of the cohorts under study showed a significant correlation between psychological discomfort and the kind of conization or degree of dysplasia. This observation implies that factors other than clinical and surgical characteristics are important in determining how women of reproductive age feel about conization. The authors argue that, given these results, additional research is necessary to enable suitable counseling and psychological support for every subgroup identified in our study. Moreover, our findings strongly imply that these kinds of interventions need to be to each patient individually tailored, considering the wide range of different circumstances that lead to substantial suffering related to the treatment.

After more than two years from the start of their treatment, one-third of women in all categories showed less desire to engage in sexual activity. The results were a bit unexpected in terms of sexual attraction. It makes sense that women of reproductive age undergoing treatment for a condition linked to an increased risk of cancer from a sexually transmitted virus would have changed their sexual behavior, especially when it comes to using condoms. But what was unexpected was that the group that showed the least enthusiasm in having sex was also the one that showed the greatest level of apathy toward the conization process.

As previously elucidated in scholarly literature, numerous women perceive conization as a therapeutic intervention for the disease and a procedure that eradicates the HPV infection [11]. They may presuppose that they will not encounter it in the future, particularly as they exhibit a lack of interest in sexual activities. Moreover, considering the patients' age, it is plausible that these women possess a diminished interest in sexual engagement due to their perception of it as a potential risk factor for the recurrence of cervical dysplasia.

While there is debate regarding the cervix's significance in female sexual function, it is well acknowledged that the loop electrosurgical excision process alters the cervix's anatomical structure. The Female Sexual Function Index (FSFI) and the Female Sexual Distress Scale (FSDS) were used to evaluate 61 sexually active women who had abnormal Papanicolaou smear or cervical punch biopsy results and needed loop electrosurgical excision procedure (LEEP). The study was conducted in Korea. The prevalence of female sexual dysfunction was shown by the FSFI scores, which were 62.5% and 66.7%, respectively, before and after LEEP. Furthermore, LEEP did not significantly impair the frequency of sexual dysfunction in the FSFI's desire, arousal, lubrication, orgasm, pleasure and pain subdomains. According to FSDS scores, however, there was no discernible rise in the experience of sexual anguish following LEEP [12]. The impact of cervical conization on women's sexual function and psychological well-being was evaluated by Michaan *et al*. [13]. The FSDS and FSFI were used to measure sexual distress and function in 55 patients receiving cervical conization who participated in the study [13]. The FSDS domains and the overall FSDS score did not significantly differ between the pre- and post-conization periods, according to the study's findings. However, the proportion of women reporting overall sexual dysfunction rose from 49% to 59% in the latter period [13].

There are limitations that should be considered with relation to this study. Initially, an unstructured interviewing approach was utilized to evaluate the psychological reactions of the female participants. As such, this makes it more difficult to compare our results with previously published literature. Nevertheless, this technique permitted the discovery of additional significant difficulties faced by these women, including the delivery of general anesthesia and the anxiety connected to perioperative discomfort. Second, this inquiry is classified as a cross-sectional study since it records women's perspectives at a certain moment in time. Since their first cervical intervention was performed more than two years before the interview, we

cannot rule out the chance that further unfavorable life circumstances have affected their current anxiety and despair levels, which in turn have influenced their interest in sexual activity. Thirdly, our study's results merely show an association at this particular time; they do not prove a causal relationship between cervical therapy and adverse psychological effects. Finally, there are no baseline data available on women's psychological reactions before or after their first treatment, which would have allowed for comparisons and the tracking of their temporal development.

The main strength of our study is that it has investigated women's perceptions several years after their initial cervical treatment therefore eliminating the impact of immediate perioperative stress on their replies during the interview. Furthermore, data were collected before women had the knowledge of their current colposcopy results as the interview was held before the examination, thus further eliminating the effect of disease status on their replies. The study that is being presented has a few limitations. The primary method among them is the assessment of patients' psychological reactions through unstructured interviews. As such, comparing our results with data that has already been published is challenging. Conversely, unstructured interviews made it possible to identify additional perioperative concerns that these patients were facing, such as pain following surgery. However, the study's strength lies in its investigation of patients up to 16 years post-operation, which effectively eliminates the impact of early perioperative stress. Additionally, as much as possible, the effects of the women's disease condition on the data were eliminated because the data were gathered before the women were informed of the findings of the follow-up exam.

5. Conclusions

The findings of our study point up the significant psychological distress experienced by women of reproductive age who undergoing cervical conization. Fear of disease progression as well as the concerns about fertility impairment are the predominant stressors. Our data suggests that a substantial proportion of patients experience acute perioperative stress, which underscores the necessity for targeted psychological support interventions. The issues identified to be associated with specific kind of distress prior the conization may help physicians to develop preoperative strategies which may reduce the fears women experience during perioperative period. Moreover, this might be helpful to further improve their postoperative HR-QoL. There is a need in the further studies about psychological stressors during the perioperative period and postoperative psychological support for women of reproductive age undergoing conization.

AVAILABILITY OF DATA AND MATERIALS

Data are the property of the University of Belgrade, Serbia and can be released upon request of interested parties, after authorization by the University.

AUTHOR CONTRIBUTIONS

RS, AT—conceptualization; writing review and editing. RS, DB, AT—methodology. RS, MA, MS, DB—investigation. RS, GP, DB—formal analysis. RS, MA, MS, GP—writing-original draft preparation. All authors have read and agreed to the published version of the manuscript.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The study was conducted in accordance with the Declaration of Helsinki and approved by the Ethics Committee of the Clinical Center of Serbia (No 541/4). All patients signed the informed consent prior to participate to study.

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CONFLICT OF INTEREST

The authors declare no conflict of interest. Andrea Tinelli is serving as one of the Editorial Board members of this journal. We declare that Andrea Tinelli had no involvement in the peer review of this article and has no access to information regarding its peer review. Full responsibility for the editorial process for this article was delegated to AEM.

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