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Clinical-Psychological Aspects Involved in Gynecological Surgery: Description of Peri-Operative Psychopathological Symptoms and Illness Behavior

Aspectos clínico-psicológicos implicados en la cirugía ginecológica: descripción de los síntomas psicopatológicos perioperatorios y el comportamiento de la enfermedad

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Abstract.

Background. Within the current literature concerning the gynecological surgery, there are only a few studies that focus on the psychological aspects that characterize the peri-operative period. In this research, the psychopathological symptoms and the illness behavior were assessed in order to confirm previous results about clinical variables such as the type and method of intervention, as well as psychological aspects regarding the positive anamnesis for mental disorders. Moreover, other factors including the desire for maternity and previous surgical interventions and pregnancies were also investigated. **Methods.** In this observational research, 58 women (age = 41.5±8.8), that undergone gynecological surgery (conservative and non-conservative) for benign pathologies, were consecutively recruited. Information on psychopathological symptoms was collected 15 days (T0) and one day before surgery (T1), and at the time of discharge (T2) through the Symptom Questionnaire (SQ). At T2, the Illness Behavior Questionnaire (IBQ) was also administered. **Results.** The descriptive analyzes conducted on the total sample demonstrated that while anxious activation and irritable mood decrease from T0 to T1, somatizations and depression mood increase between T1 and T2. Moreover, the comparisons between groups, dividing the sample according to the clinical-medical and psychological variables, highlighted that the type and modality of the intervention, as well as a positive history for the presence of psychological disorders, the desire for maternity, and previous surgical interventions and pregnancies, can influence the course of psychopathological symptoms. **Conclusion.** This study highlights the need to include a clinical-psychological evaluation and to pay attention to specific clinical variables regarding women that are undergoing a conservative or non-conservative gynecological surgery. Considering the psychological impact of these type of interventions, the clinical history of these women, as well as their fears and desires, could facilitate a better management of the patients in terms of well-being, adherence to treatment, and recovery.

Resumen.

Fundamento. Dentro de la literatura actual referente a la cirugía ginecológica, existen pocos estudios que se centren en los aspectos psicológicos que caracterizan el perioperatorio. En esta investigación se evaluaron los síntomas psicopatológicos y la conducta de enfermedad con el fin de confirmar resultados previos sobre variables clínicas como el tipo y método de intervención así como aspectos psicológicos en cuanto a la anamnesis positiva para trastornos mentales. Además, también se investigaron otros factores, como el deseo de maternidad y las intervenciones quirúrgicas y embarazos previos. **Métodos.** En esta investigación observacional, se reclutaron consecutivamente 58 mujeres (edad=41.5±8.8), sometidas a cirugía ginecológica (conservadora y no conservadora) por patologías benignas. La información relativa a los síntomas psicopatológicos se ha recogido durante 15 días (T0) y un día antes de la cirugía (T1), y en el momento del alta (T2) a través del Cuestionario de Síntomas (SQ). En T2 también se administró el Cuestionario de Conducta de Enfermedad (IBQ). **Resultados.** Los análisis descriptivos realizados sobre la muestra total demostraron que mientras la activación ansiosa y el estado de ánimo irritable disminuyen de T0 a T1, las somatizaciones y el estado de ánimo depresivo aumentan entre T1 y T2. Además, las comparaciones entre grupos, dividiendo la muestra de acuerdo con las variables clínico-médicas y psicológicas, destacaron que el tipología y modalidad de la intervención, así como una historia positiva para la presencia de trastornos psicológicos, deseo de maternidad y antecedentes quirúrgicos, las intervenciones y los embarazos pueden influir en el curso de los síntomas psicopatológicos. **Conclusión.** Este estudio pone de relieve la necesidad de incluir una evaluación clínico-psicológica y prestar atención a variables clínicas específicas en mujeres que se someten a una cirugía ginecológica conservadora o no conservadora. Considerando el impacto psicológico de este tipo de intervenciones, la historia clínica de estas mujeres, sus miedos y deseos podría facilitar un mejor manejo de las pacientes en términos de bienestar, adherencia al tratamiento y recuperación.

Keywords.

Gynecological Surgery; Health psychology; Psychological aspects; Psychopathological symptoms; Recovery.

Palabras Clave.

Cirugía Ginecológica; Psicología de la salud; Aspectos psicológicos; Síntomas Psicopatológicos; Recuperación.

1. Introduction

Gynecologic surgery involves a wide range of surgical procedures (Falandry et al., 2022). Although it is a rich field of clinical-medical research, not much has been written about the related clinical-psychological aspects (Carter et al., 2010; Maksimović et al., 2009; Öztürk et al., 2018; Pellegrini et al., 2017; Salehi et al., 2018). Furthermore, the opinions among researchers are also conflicting (Birsan et al., 2018; Ferrandina et al., 2020; Frumovitz et al., 2020; Hartmann et al., 2004; Helström & Nilsson, 2005; Mann et al., 2020). Some studies have suggested that hysterectomy could reduce symptoms of depression and anxiety, increase general well-being (Aziz et al., 2005; Mattsson et al., 2020; Persson et al., 2010), and improve their interpersonal functioning in terms of a better perception of the body image and sexual functioning (Klock et al., 2021; Pauls, 2010). However, other researchers found evidence of a decrease in well-being and in the quality of life (Darwish et al., 2014; Khastgir et al., 2000; McPherson et al., 2005).

Recently, the attention of the researchers started to focus specifically on the period just before the surgery to highlight the cognitive attitude and the illness behavior related to it. A study of Amorim and colleagues (2018) underlined that in the moment of reading the informed consent, the most widespread emotion is the fear of the risks of the procedure, followed by indifference and resignation. According to these researchers, both attitudes, however, are accompanied by the motivation to undergo surgery in order to eliminate pain and restore the well-being prevented by the disease. Also, other authors have emphasized the psychological value of the moment of signing informed consent (Bonadies et al., 2011; Brain et al., 2004; Tiller et al., 2005). For instance, in women with gynecological cancer, it was found that patients use the moment of communication of diagnosis to gain as much information as possible on risk management options. If a surgical intervention were the best option, detailed information was on the potential effects on quality of life after surgery (Etchegary et al., 2018).

Other studies even wanted to highlight psychological factors that predict depression and well-being in the post-operative period. The results of a study with women undergoing hysterectomy for benign indication showed that baseline levels of pre-operative depression, energy, and positive well-being predict their respective levels after surgery (Theunissen et al., 2017).

One of the points that accords all the researchers is the fact that there are many factors capable of influencing post-operative recovery and peri-operative symptoms. The current research continues to pay attention to the inter-individual variability, and a growing field of studies has identified a subgroup of women reporting substantial negative psychological outcomes (Flory et al., 2005). It appears that the emotions and psycho-

logical factors most involved are pre-operative pain and trait anxiety (Carr et al., 2005; Vandyk et al., 2011), as well as perceived social support (Thornton et al., 1997). Currently, the role of biological explanations that emphasize hormonal influences on mood (Schwartz et al., 2002) is given less weight and it is considered together with other factors such as a history of a psychiatric disorder that was repeatedly confirmed as the major predictor of the psycho-physical recovery after surgical interventions (Cooper & Gath, 1983; Khastgir et al., 2000; Oates & Gath, 1989; Yen et al., 2008).

Although it is difficult to understand the interplay between all these factors, it is important for the gynecologist to be familiar with the psychiatric/psychological history of the patient. In the scientific field, however, there is a need to deepen this line of studies and to indicate the most useful information to consider for the patients' health and recovery after surgery. Thus, our study fits within the line of studies that identify clinical variables (both medical and psychological) that can influence the peri-operative symptoms. The authors focused on a variety of clinical-medical variables and included an analysis on clinical-psychological variables as well. In this research, the assessment of psychopathological symptoms and a description of the illness behavior are included.

1.1 Aims of the Work

At a descriptive level, the authors expect to find different manifestations of psychological distress according to the peri-operative moment, because it is supposed that anxiety may increase as the day of the operation approaches. Conversely, we expect to detect depressive symptoms post-operatively, when functional limitations and pain invalidate the woman's life.

The main object of the present study was to evaluate the potential clinical-medical and psychological role in conservative and non-conservative gynecological surgeries for benign pathologies. In particular, the authors focused on indications, methods, and typology of the intervention as well as the positive/negative anamnesis for psychological disorders, surgical interventions, abortions, and voluntary interruptions of pregnancy. These aspects are supposed to be related to the relevant symptoms and behavior of the disease. More specifically, it is hypothesized that there may be significant differences in psychopathological symptoms depending on the type of pathology and intervention (more invasive interventions can create greater anxiety and concern before the intervention). Furthermore, it is also hypothesized that previous surgical interventions or pregnancies in the history may be a cause of greater anxiety activation. Nevertheless, considering the more purely psychological aspects, we expect to confirm the results obtained by previous studies regarding the positive anamnesis for mental disorders as a risk factor for the onset of psychopathologi-

cal symptoms during the peri-operative period. Lastly, it is assumed that other psychological aspects may also influence the level of well-being in women undergoing gynecological surgery. Thus, it will be investigated if even the desire for maternity can be a risk factor for a greater emotional imbalance. In particular, it is hypothesized that women who hope to have future pregnancies can experience gynecological interventions and their outcomes with greater apprehension.

2. Materials and Methods

2.1 Participants and Study Design

In this observational and cross-sectional study, 58 women, aged between 28 and 59 years old (mean 41.5 ± 8.8), that should have undergone a gynecological surgical intervention (conservative or non-conservative) for benign pathologies were consecutively recruited from the Obstetrics and Gynecology Unit of the Hospital of Carpi (Modena, Italy). The criteria for the inclusion in the study were: Italian nationality or good comprehension of Italian language; absence of sensory disturbances of sight and/or hearing that limit the administration of the tests (i.e. previous head trauma, neurological condition, alcoholism or substance abuse, or neoplasms); age from 28 to 60 years; either fertile age or menopause; conservative and non-conservative gynecological interventions for uterine pathologies (myometrium and endometrial), and benign adnexal pathologies, and prolapse with methods of the intervention being laparotomy, laparoscopy, or vaginal procedure. Women that underwent gynecological surgical interventions for neoplasm, examinations of the uterine cavity, sterilization, and post-partum complications were excluded from the sample.

2.2 Procedures

A clinical psychologist administered the psychometric tests and conducted a clinical interview aimed at explaining the purpose of the study and collecting the patient's clinical-medical and clinical-psychopathological history. The following variables were investigated: indications, methods, and typology of the intervention; positive/negative anamnesis for psychological disorders; previous surgical interventions, abortions, and voluntary interruptions of pregnancy. Patients were taken to a quiet room and were informed by a research assistant about the study procedures. At T0 (15 days before the intervention), the informed consent was obtained and the patients were asked to complete a questionnaire that investigates psychopathological symptoms. One day before the intervention (T1) and on the day of discharge (T2), the psychopathological symptoms were assessed again. At T2, a questionnaire that describes the illness behavior was also administered (see below).

2.3 Measures

The Symptom Questionnaire (SQ; Fava et al., 1983) was used to assess the pre-post operative course of the psychopathological symptoms. The SQ is a self-assessment questionnaire composed of 92 dichotomous items that investigates the state of well-being/distress perceived by the subject during a specific period. It contains four scales based on the factorial analysis of the psychological symptoms of Anxiety (A), Depression (D), Somatization (S), and Hostility (H). Each scale can be divided into 2 sub-scales, one concerned with symptoms and the other with well-being, for a total of 8 sub-scales. Therefore, each of the main scales includes items from both the symptoms and the well-being sub-scales. The clinical cut-off corresponds to 4 for all the scales of the test. The SQ has been demonstrated to have excellent test-retest reliability (Benasi et al., 2020). This instrument demonstrated to have high sensitivity and specificity levels—80% and 76% in general practice, respectively; 86% and 74% in hospital medical wards; and 83% and 85% in emergency departments (Rucci et al., 1994)—. Such observations allowed this instrument to be particularly adequate, not only for the initial assessment of the patients' complex clinical profiles, but also for monitoring the course of their self-reported symptoms overtime. This test has weekly, daily, and hourly versions. At T0, the weekly version was used, while at T1 and T2, the daily version was used.

The Illness Behavior Questionnaire (IBQ; Fava et al., 1982; Pilowsky & Spence, 1994) quantifies aspects of the way individual experience and respond to their health status and can also be used as a screening instrument (Pilowsky et al., 1984). It is a 62-items questionnaire that was originally developed as an expansion of the 14-item Whiteley Index of Hypochondriasis (Pilowsky, 1967). The 52-item original version was expanded to 62-items to ensure that each of the seven scales comprised at least 5 items. The scales were derived from a factor analytic study of the responses of 100 pain clinic patients, and have derived support from two independent studies. The validity and reliability of the scales are described in detail in the Manual for the Illness Behavior Questionnaire (Pilowsky & Spence, 1994). The resultant 62-item IBQ comprises seven primary scales: General Hypochondriasis (GH), Disease Conviction (DC), Psychological vs. Somatic Focusing (SF), Denial (D, purported to be direct measures of illness behavior), and Affective Inhibition (AI), Affective Disturbance (AD, or Dysphoria), and Irritability (I, measures of affect). Two second-order factors are also commonly derived from the IBQ. Disease Affirmation is a composite measure comprising Disease Conviction and Psychological vs. Somatic Focusing, while Affective State consists of General Hypochondriasis, Affective Disturbance, and Irritability. The cut-off scores used in the present research were obtained from a study conducted on internal medicine

Table 1

Clinical-medical characteristics regarding indications, typology, and method of the intervention of the total sample (n = 58)

Indications	
Uterine pathologies (myometrial and endometrial)	
Fibromatosis	
Symptomatic, N(%)	11 (19.1)
Menometrorrhagic, N(%)	6 (10.3)
Volumetric, N(%)	14 (24.1)
Adnexal pathologies, N(%)	6 (10.3)
Prolapse, N(%)	21 (36.2)
Typology	
Total/subtotal hysterectomy, N(%)	23 (39.7)
Gynaecological interventions excluding uterus removal, N(%)	35 (60.3)
Method	
Laparoscopy, N(%)	27 (46.6)
Laparotomy, N(%)	26 (44.8)
Vaginal Procedure, N(%)	5 (8.6)

patients by the authors of the instrument and correspond to GH=3.44, DC=2.9, SF=2.82, D=4.5, AI=4.12, AD=4.4, I=4.56. Cronbach's alpha ranges between .71 and .89 for each sub-scale.

2.4 Data Analysis

Statistical analysis was performed using Microsoft Excel and IBM SPSS Statistics software (Version 28.0.1.0). The following descriptive statistics were computed: mean and standard deviation of the scores obtained from the total sample in the sub-scales (A, D, S, and H) of the SQ in the three administrations (T0, T1, and T2); mean and standard deviation of the scores obtained from the total sample in the sub-scales of the IBQ administered at T2.

One of the purposes of this study was to identify the possible impact of the different clinical characteristics on the SQ and IBQ, so the sample was divided into sub-groups by the following variables: (1) Total/subtotal hysterectomy vs. gynecological interventions excluding uterus removal; (2) Indications for the intervention: uterine pathologies (endometrial and myometrium), adnexal pathologies, prolapse; (3) Methods of the intervention: laparotomy, laparoscopy, vaginal procedure; (4) Pertaining symptomatology absent vs. present; (5) Positive vs. negative anamnesis for prior surgical interventions; (6) Positive vs. negative anamnesis for prior pregnancies; (7) Positive vs. negative anamnesis for abortion (spontaneous/therapeutic) and/or voluntary termination of pregnancy (VTP); (8) Desire for maternity: absent vs. present; (9) Positive vs. negative psychopathological personal history. Tests for Skewness, Kurtosis, and Kolmogorov-Smirnov were used to determine normality of distribution. Since the assumption of normality has not been respected, the following analyses were computed: the Mann-Whitney U test was used when the sample was divided in two independent groups according to

the clinical variable considered, while the Kruskal-Wallis test was used when the sample was divided in more than two independent groups depending on the clinical variable considered.

3. Results

By considering the large standardized Cohen's effect size ($d = .5$), a type I error of 5% ($\alpha = .05$) and a type II error of 5% ($\beta = .05$; power =95%), an a-priori power calculation using GPower 3.1 (Faul et al., 2009), revealed that 66 participants were required. Although the subjects recruited in the actual research is less than 66, a post-hoc power analysis revealed that a sufficient power of 0.83 was achieved with the current sample size of 58. Considering the socio-demographic characteristics of the sample, all the women were employed, married, or partnered, and 72% of them ($n = 42$) had at least one child. The distribution of women according to their educational level (middle school, high school diploma, or University degree) was equal. The clinical-medical data of the sample are reported in Table 1.

Table 2

Descriptive analysis of the Symptom Questionnaire on the three administration: at T0 (15 days before the intervention), at T1 (the day before the intervention), and at T2 (the day of discharge) (mean and standard deviation)

	T0		T1		T2	
	M	SD	M	SD	M	SD
Anxiety (A)	7.10	4.36	6.53	5.29	4.35	4.34
Depression (D)	5.05	3.77	4.6	2.63	5.14	2.7
Somatization (S)	7.9	5.63	5.33	4.22	10.4	4.32
Hostility (H)	3.45	3.08	1.78	2.47	1.14	1.19

The average values and the standard deviation of the obtained scores from the entire sample at SQ scales and sub-scales confirm that the psychopathological symptoms course in the peri-operative period (from 15 days before the intervention to the discharge day) is characterized by an important inter-individual variability (see Table 2).

From a descriptive point of view (see Figure 1), the anxious hyper activation trend confirms the hypothesis and shows a decreasing trend with values higher than the clinical cut-off (=4) in the period prior to the intervention and lower values at the discharge. On the contrary, depressive symptoms tend to stay constant and near the threshold level before the operation, with an increase in post-operative period as expected. Moreover, the Somatization scale shows elevated values in the operative period, with significant decrease in the day before the intervention. Finally, hostility shows a decreasing trend but with all values being under the clinical cut-off (=4).

Looking at the average values of the IBQ, the same inter-individual variability emerges as well (see Table 3). However, no noteworthy clinical aspects emerged.

Table 3

Average values of the Illness Behavior Questionnaire in the total sample

	<i>M</i>	<i>SD</i>
General Hypochondriasis	2.23	2.03
Disease Conviction	1.93	1.28
Psychological vs. Somatic Focusing	2.19	.93
Denial	3.33	1.29
Affective Inhibition	1.7	1.55
Affective Disturbance	1.61	1.52
Irritability	.95	1.16

However, interesting aspects emerged considering the impact of the different clinical-medical and clinical-psychological variables on the psychopathological symptoms assessed through the SQ and the illness behavior described with the IBQ. Therefore, the statistical analyses conducted confirmed the hypotheses that drove this research and highlighted other aspects related to the specific moment of administration (T0, T1, and T2).

3.1 Clinical Variables, Pertaining Symptomatology, and Illness Behavior: Subgroups in Comparison Indications, Typology, and Methods of the Intervention

A Mann Whitney *U* test was conducted comparing the women undergoing surgical gynecological interventions (with the exclusion of the uterus removal) (*N* = 35) and women undergoing total or subtotal hysterectomy (*N* = 23). The first group reports higher degree of anxiety (*U* = 276; *p* < .05), inability to relax (*U* = 217.5; *p* < .01), hostility (*U* = 262; *p* < .05), and lack of physical wellbeing (*U* = 279; *p* < .05) in the post-operative period (T2).

Regarding the indications for the interventions before the intervention (T0), the Kruskal-Wallis test highlighted that women with uterine pathologies (*N* = 31) report more intense depressive symptoms compared to those with adnexal pathologies (*N* = 21) ($\chi^2 = 6.01$; *p* < .05) and prolapse (*N* = 6) ($\chi^2 = 6.2$; *p* < .05). Instead, at T1, psychological impact is greater for women with adnexal pathologies. In fact, they report higher levels of anxiety ($\chi^2 = 6.43$; *p* < .05) and depression ($\chi^2 = 6.39$; *p* < .05).

Furthermore, the Kruskal-Wallis test that was made considering the methods of the intervention before the intervention, showing that women undergoing laparotomy (*N* = 26) have the greatest compromise of psychophysical well-being with more intense symptoms of anxiety ($\chi^2 = 6.47$; *p* < .05), depression (T0: $\chi^2 = 10.92$; *p* < .01 and T1: $\chi^2 = 12.16$; *p* < .01), and somatic symptoms (T0: $\chi^2 = 7.37$; *p* < .05). However, a day before the operation (T1), subjects operated in laparoscopy (*N* = 27) report the greatest level of anxiety ($\chi^2 = 8.37$; *p* < .05) and depression ($\chi^2 = 6.43$; *p* < .05).

3.2 Symptomatology Associated to the Indication (Present vs Absent)

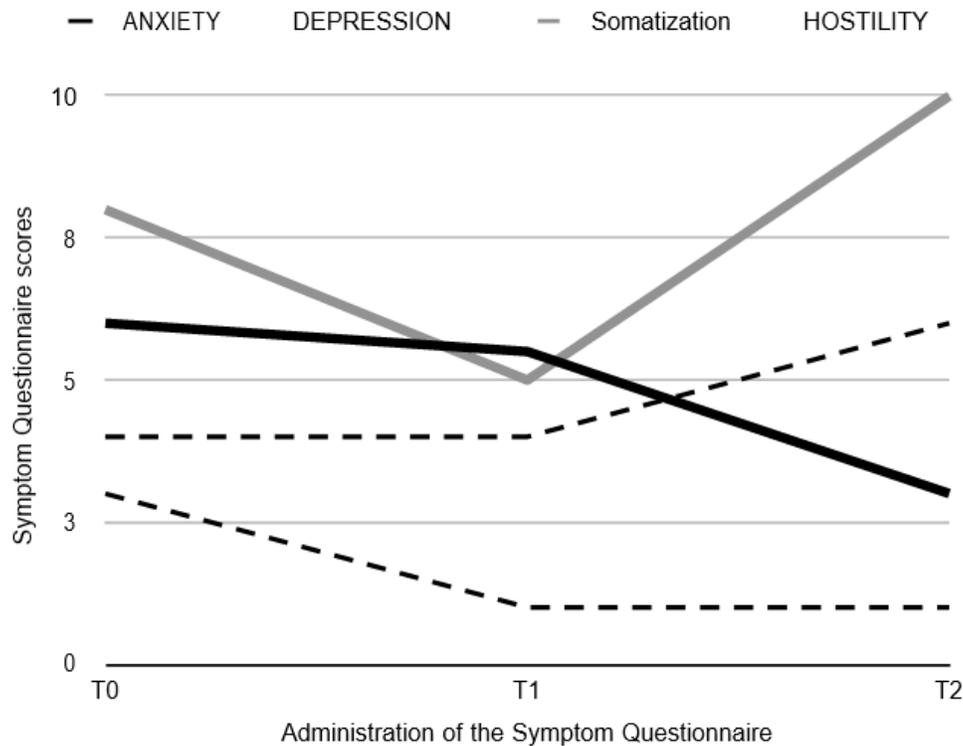
The Mann-Whitney *U* test revealed that subjects (*N* = 38) showing organic symptoms associated with a moderate-intense indication for the intervention report higher levels of somatic symptoms (T0: *U* = 233.5; *p* < .05 and T1: *U* = 249.5; *p* < .05) and lack of physical wellbeing (T0: *U* = 236.5; *p* < .05). Besides, these somatizations are connected to a greater psychological impact after the surgery (T2), which causes more intense anxiety (*U* = 221; *p* < .05) and depressive symptoms (T0: *U* = 247.5; *p* < .05 and T1: *U* = 207; *p* < .01).

3.3 Positive vs Negative Anamnesis for Prior Surgical Interventions, Prior Pregnancies, Abortion and/or Voluntary Termination of Pregnancy (VTP)

The psychopathological symptoms assessed at T0 of the women that underwent other (gynecological or not) surgical interventions in the past (*N* = 48) were compared with those of the women that had never undergone any operations (*N* = 10). The experienced group reported higher levels of anxiety (*U* = 126.5; *p* < .05) and greater difficulty of feeling content (*U* = 128.5; *p* < .05), while the second group reported lower levels of hostility (assessed through the SQ) and irritability (assessed through the IBQ) (*U* = 127; *p* < .05 and *U* = 131; *p* < .05) after the intervention (T2).

Furthermore, the Mann-Whitney *U* test revealed that having had prior pregnancies (*N* = 34) is associated with higher levels of reported hostility (*U* = 277; *p* < .05 and *U* = 283.5; *p* < .05). However, lower levels of anxiety (*U* = 265; *p* < .05 and *U* = 267.5; *p* < .05) and greater a-

Figure 1



bility to relax ($U = 279.5; p < .05$ and $U = 282.5; p < .05$) emerge during the pre-operative period (both at T0 and at T1).

No significant differences between the group of subjects with positive anamnesis for VTP ($N = 7$) and the group with positive anamnesis for spontaneous and/or therapeutic abortion ($N = 7$) were found with the Mann-Whitney U test. As a result, these sub-groups were considered jointly. In fact, it appears that both groups of women ($N = 14$) reported greater ability to relax ($U = 198; p < .05$) and to feel content ($U = 147.5; p < .01$) at T1. After the surgery (T2), they reported lighter symptoms of depression ($U = 149; p < .01$), greater relaxation ($U = 172; p < .05$), and a minor impact on physical well-being ($U = 189; p < .05$).

3.4 Psychological Variables: Psychopathologic Anamnesis and Desire for Maternity

Subjects with positive psychopathological anamnesis ($N = 15$) were compared to persons with negative anamnesis using the Mann-Whitney U test in order to confirm the results obtained by previous studies. The first group reported higher levels of anxiety before the intervention (T0: $U = 197; p < .05$ and T1: $U = 175; p < .01$), while the IBQ highlighted higher dysphoria connected to the pathology ($U = 207; p < .05$) and a higher tendency to express their own feelings, especially negative ones ($U = 192.5; p < 0.05$).

Finally, considering the desire for maternity, innovative aspects emerge. In fact, the Mann-Whitney U test demonstrates that women who manifest desire for more pregnancies ($N = 26$), compared to those who do not want to have more children ($N = 32$), report more intense anxiety symptoms (T0: $U = 238.5; p < .01$ and T1: $U = 260.5; p < .01$) and lower ability to relax ($U = 263; p < .05$ and $U = 225; p < .01$) before the intervention. Furthermore, higher hostility levels in the peri-operative period (T0: $U = 280.5; p < .05$ and T1: $U = 260; p < .05$) can be observed.

4. Discussions

As for the descriptive analyzes conducted on the psychopathological symptoms, interesting aspects emerged. First, high levels of anxiety and somatizations highlighted the anxious hyper activation that characterizes the pre-operative period. Furthermore, a slight decline in mood was also noted. In fact, it is possible to hypothesize that the preparation for the intervention generates fears and concerns and that this condition remains substantially stable for the two weeks considered, from T0 to T1. Even though on a qualitative level, an opposite trend emerged by observing the scores of the last administration. At the time of discharge, the anxious hyper activation is replaced by a notable increase in symptoms of depression and somatizations. Understandably, the somatic symptoms increase within the outcome of

surgery and, in addition, they are accompanied by a noticeable change in mood. Hence, it is possible to hypothesize that the mood is affected by the presence of painful symptoms that are annoying. Moreover, the limitations resulting from the surgical operation and the medical indications that are usually provided (remain at rest, do not make efforts, etc.) can also generate sadness and perception of disability that can be debilitating itself.

Moreover, the results obtained by the present study confirm the great inter-individual variability that characterized the subjective experience associated with gynecological surgical interventions. In this research specific, clinical medical and psychological variables were described as potential factors responsible for such variance. For instance, confirming previous studies in the literature, psychological impact in the post-operative period is greater for women who underwent interventions, compatibly with the outcomes of the more invasive intervention. These women reported higher levels of anxiety, inability to relax, and sense of general malaise compared to the women that underwent hysterectomy (Darwish et al., 2014; Khastgir et al., 2000; McPherson et al., 2005). Regarding the indications for the intervention, 15 days before it, women with uterine pathologies complained more about intense depressive symptoms, while women affected by adnexal pathologies experienced greater symptoms of anxiety and depression the day before surgery. The same tendency is revealed regarding the methods of the intervention. For instance, two weeks before the subjects underwent laparotomy, they reported greatest levels of anxiety, depression, and somatic symptoms, while in the proximity of the intervention, higher levels of anxiety and depression are experienced by women that underwent laparoscopy surgery. Considering these latter aspects, it is possible to hypothesize that the more invasive interventions generate anxious activation and worries at least two weeks before the surgery. However, even women who have to undergo laparotomy or an intervention aimed at treating adnexal pathologies and prolapse feel fear the day before. Conversely, the slightest psychological impact is associated with gynecological interventions for prolapse and vaginal procedure.

These data suggest that different levels of psychological distress can be attributed to indications, methods, typology of intervention as well as the type of given information. In fact, even in the cases of surgical operations of laparoscopy and in the presence of adnexal pathologies, the possibility of non-conservative uterine interventions or of consequent necessity of laparotomy operation is not excluded. Such possibility is also clearly specified in informed consent signed by the patient. Therefore, it seems that the impact on psychophysical wellbeing can be partially attributed to this state of great uncertainty. In fact, different pieces of given information and the following expectations seem to significantly influence peri-operative symptomatology course and emotional psycho-

logical consequences for women.

In addition, in this research specific data regarding the psychological aspect were collected. Confirming the literature (Cooper & Gath, 1983; Khastgir et al., 2000; Oates & Gath, 1989; Yen et al., 2008), a previous history of psychological disorders seems to modulate the psychopathological symptoms and the distress of these women already vulnerable to stress and emotionally fragile. Nevertheless, also the patient's type of pain perception and the fears and expectations concerning the intervention must be considered before a surgical gynecological intervention. These aspects, strictly related to the "psyche" of the patients, can influence the period of convalescence and physical recovery. Furthermore, the administration after the intervention of the questionnaire that investigates the illness questionnaire allowed highlighting some noteworthy aspects. More specifically, it seems that the presence of emotional instability and difficulty in managing emotions, especially the negative ones, differentiate a psychiatric group from a mentally balanced group.

Nonetheless, an innovative result emerged taking into account the individual history in terms of previous pregnancies and the desire to have children in the future. In particular, the desire for maternity also creates a higher level of tension towards the intervention, probably due to the expectations associated with it, while prior pregnancies are associated with a decrease in anxiety and ability to relax. To our knowledge, the desire for maternity emerged for the first time as a risk factor towards psychopathological suffering. Indeed, women who wish to become pregnant experienced more intense levels of fear related to the surgery and are, understandably, and consistently with our hypotheses, more concerned about its outcomes.

In summary, the psychopathological symptom that emerges most frequently is anxious activation. However, it is also interesting to note that this symptom has a physiological trend because it decreases after the stressful event. It is important to note that anxious activation is part of everyday life: it is an index of adaptation of the body since it promotes the mobilization of useful resources to deal with certain stressful situations. However, if prolonged over time, this activation can become useless and even harmful (Cosentino et al., 2018; De Vincenzo et al., 2022; Selye, 1936). It is fundamental to emphasize that the monitoring of anxious states is necessary. A certain degree of activation is frequent in patients who must undergo surgery, but its trend must be monitored specifically after the surgery in order to be ready to intervene if a return to baseline levels is not observed.

Another point to consider is the influence of emotional-psychophysiological states on some physical aspects, such as the perception of pain. The presence of depressive symptoms after the operation (e.g., low mood, dys-

functional thoughts, withdrawal and isolation, and poor social involvement) can modulate the attentional focus and, therefore, accentuate the perception of pain and somatic symptoms. From a clinical point of view, physicians and psychologists already know that even the mental representation of pain constitutes a stressful stimulus. For instance, the individuals that are unable to “mentalize” pain tend to deny the physical symptoms. These cases are considered risk factors for the psycho-physical post-operative recovery. On the other hand, other subjects, only by imagining their pain, are considered to be activated from an emotional-psychophysiological point of view and can carry out denial thoughts and avoidance behaviors which are so dangerous to human health (Pruneti & Guidotti, 2020). In other words, the perception of fear, when protracted and no longer connected to the event that triggered it, can favor maladaptive thought processes and the adoption of risk behaviors for health.

In conclusion, this study highlighted several factors that health professionals need to pay attention to. Unfortunately, due to the observational nature of this study, it was possible to describe only with preliminary analyzes the clinical variables capable of modulating the psychological suffering in the days preceding surgery and the emotional experience at the time of discharge. For this reason, further studies with larger sample sizes are needed. Involving a large number of women would make it possible to create more numerous sub-groups and, in this way, more sophisticated and advanced statistical analyzes. More specifically, it would be useful to compute a linear regression in order to highlight the weight of the specific variables taken into consideration and, possibly, also the interactions between them.

Furthermore, other psychological measures could be considered. For instance, further studies could highlight the role of specific behaviors at risk for the development of stress-related symptoms and disorders. Moreover, considering that women with previous mental disorders suffer the most before and after surgery, vulnerability to stress and specific personality traits could highlight high levels of trait anxiety (which predispose to the full-blown anxiety disorders) and introversion (which, instead, is typical of depressive disorders). The P Stress Questionnaire and the 16-Personality Factors Questionnaire could be added to the questionnaire that detects psychopathological symptoms in order to better describe the suffering of these women in its complexity.

Lastly, considering the importance of monitoring the psychological distress, it would be useful to re-assess these women during a follow-up. In fact, the study could be replicated by monitoring the course of post-operative psychological symptoms possibly through administering the questionnaire even one month after surgery. Paying attention to the post-operative convalescence period would allow assessing long-term psychophysical recovery and, likely, intervening with psychological programs.

5. Conclusion

The results of this research allow to underline the clinical variables that influence the well-being of a group of women undergoing gynecological surgery. Some data already existing in the scientific literature have been confirmed, while other aspects seem to emerge for the first time. For instance, more invasive interventions are certainly more worrying. However, less invasive interventions are probably initially underestimated, but then they can generate fear and anxiety just the day before the surgical intervention. Furthermore, on a psychological level, not having had pregnancies and the desire to have them in the future seem to be prominent risk factors for the development of further psychopathological symptoms. To conclude, paying attention to these variables would be helpful in order to guarantee a better experiencing of the surgery and, at the same time, facilitate psychophysical recovery. Hopefully, this line of research currently lacking in literature will become enhanced and it will encourage the adoption of good practices for the clinicians and interdisciplinary teams. Nevertheless, despite the rich literature regarding the interconnection between mind and body, this concept is not always adequately considered and the medicine units that benefit from the presence of clinical psychologist and counseling services are still few in the western countries. An integrated approach would surely allow for a multidisciplinary discussion between various health professionals to pursue the better management of the patients care and their disease.

6. Institutional Review Board Statement

This study was conducted in accordance with the recommendations of the local ethic committee at the Hospital of Carpi (Modena, Italy). In Italy, until 2018, no ethical approval was required for observational nature studies, since they were not defined as medical/clinical research, according to the Italian law No. 211/2003. The study was conducted before 2018 and included non-clinical surveys which used non-invasive measures. Furthermore, this study complies with the Declaration of Helsinki and with Italian privacy law (Legislative decree No. 196/2003). No treatments or false feedback were given, and no potentially harmful evaluation methods were used. Participation was voluntary, and participants could drop out at any time without any negative consequences. All data were stored only by using an anonymous ID for each participant.

7. Informed Consent Statement

All data were handled in accordance with the ethical standards established in the 1964 Helsinki Declaration. Subjects' anonymity was preserved, and the data obtained were used solely for scientific purposes.

8. Data Availability Statement

The data presented in this study are available upon reasonable request from the corresponding author.

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