

# Influence of the Preoperative Decision-Making Process on the Postoperative Outcome after Hysterectomy for Benign Uterine Pathologies

Der Einfluss des präoperativen Entscheidungsfindungsprozesses auf das postoperative Outcome nach Hysterektomie aufgrund benigner uteriner Pathologien

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## Key words

- hysterectomy
- laparoscopy
- patient-reported outcomes
- sexual function
- quality of life
- gynaecology

## Schlüsselwörter

- Hysterektomie
- Laparoskopie
- Patient-reported Outcomes
- Sexualfunktion
- Lebensqualität
- Gynäkologie



Deutsche Version unter:  
[www.thieme-connect.de/  
ejournals/gebfra](http://www.thieme-connect.de/ejournals/gebfra)

received 4. 11. 2015  
revised 25. 11. 2015  
accepted 27. 11. 2015

## Bibliography

DOI [http://dx.doi.org/  
10.1055/s-0041-110396](http://dx.doi.org/10.1055/s-0041-110396)  
Geburtsh Frauenheilk 2016; 76:  
383–389 © Georg Thieme  
Verlag KG Stuttgart · New York ·  
ISSN 0016-5751

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## Abstract

**Introduction:** The aim of this study was to assess whether the preoperative decision-making process might influence treatment success in premenopausal women undergoing hysterectomy for benign uterine pathologies

**Materials and Methods:** All premenopausal women treated with hysterectomy for benign uterine pathologies between April 2011 and June 2013 at a tertiary university center were enrolled in this prospective observational cohort study. Five parameters of the preoperative decision-making process were assessed upon their correlation with postoperative quality of life, sexual function and patients' satisfaction. These outcome measures were assessed for the pre- and postoperative (six months after surgery) status using two validated questionnaires (EQ-5D and "female sexual function index" (FSFI). Patients' satisfaction with the postoperative outcome was assessed with a self-developed questionnaire.

**Results:** 255 of 402 (63%) patients completed the study. A correlation between the co-variables "interval between first counseling and decision to surgery", "subjectively perceived quality of the preoperative counseling" and "certainty in the decision for the intervention" and postoperative outcomes were found. The co-variables "person mainly responsible for election of hysterectomy mode" and "discussion of decision for surgery with others" showed no influence on postoperative patients-reported outcomes.

**Conclusion:** We found a correlation between certain parameters of the preoperative decision-making process and postoperative patient-reported sexual function, quality of life and patients' satisfaction in premenopausal women undergoing hysterectomy for benign uterine pathologies. An optimization of these factors could contribute to an improvement in treatment outcomes.

## Zusammenfassung

**Einleitung:** Ziel dieser Studie war es zu untersuchen, ob Faktoren des präoperativen Entscheidungsfindungsprozesses vor elektiver Hysterektomie aufgrund benigner uteriner Pathologien den postoperativen Behandlungserfolg beeinflussen.

**Material und Methodik:** Eingeschlossen in diese Beobachtungsstudie wurden alle prämenopausalen Patientinnen, die sich aufgrund benigner uteriner Pathologien im Zeitraum April 2011 bis Juni 2013 in der Universitätsfrauenklinik Homburg einer elektiven Hysterektomie unterzogen. Fünf Faktoren des präoperativen Entscheidungsfindungsprozesses wurden auf eine Korrelation mit den Variablen postoperative Lebensqualität, Sexualfunktion und der Zufriedenheit mit dem durchgeführten Eingriff untersucht. Diese Parameter wurden mithilfe zweier validierter Fragebögen dem EQ-5D und dem „female sexual function index“ (FSFI) für den prä- und postoperativen Status (6 Monate postoperativ) erhoben. Die Zufriedenheit mit dem Operationsergebnis wurde mithilfe eines durch die eigene Arbeitsgruppe entwickelten „Zufriedenheitsscore“ erfasst.

**Resultate:** Von 402 initial eingeschlossenen Patientinnen konnten die Ergebnisse von 255 Patientinnen (63%) ausgewertet werden. Für die Faktoren „Sicherheit bei der Entscheidung für den Eingriff“, „subjektiv empfundene Güte der präoperativen Aufklärung“ und „Zeit bis zur Entscheidungsfindung“ konnte eine Korrelation mit dem postoperativen Outcome gezeigt werden. Für die Faktoren „subjektiv empfundener Hauptentscheidungssträger für die Auswahl des Operationsverfahrens“ und „Beeinflussung des Entscheidungsfindungsprozesses durch externe Personen“ wurde keine Korrelation mit dem postoperativen Outcome beobachtet.

**Schlussfolgerung:** In dieser Studie konnte gezeigt werden, dass einzelne Faktoren des präoperativen Entscheidungsfindungsprozesses das postoperative Outcome elektiver Eingriffe wie in diesem Falle der elektiven Hysterektomie im Hinblick auf Lebensqualität, Sexualfunktion und Patientenzufriedenheit in signifikantem Ausmaß beeinflussen können. Eine Optimierung dieser Schritte könnte zu einer Verbesserung des Behandlungsergebnisses beitragen.

## Introduction

The preoperative decision-making process and the preoperative medical consultations are integral components of a surgical treatment. These processes are complex and are influenced by various factors [1]. Recent findings like those from the group of Hempowicz et al. showed that the preoperative decision-making process is not only influenced by various factors such as, for example, the extent of the preoperative consultations or the nature of the planned intervention itself but can also have an impact on the postoperative treatment outcome [2]. The guidelines of the German Society of Gynaecology and Obstetrics (Deutsche Gesellschaft für Gynäkologie und Geburtshilfe [DGGG]), newly published in February 2015 which comprehensively deal with the indications and methods of hysterectomy for benign uterine diseases, emphasise the significance of the preoperative decision-making process in a separate section on preoperative patient information [3]. However, to the best of our knowledge, there is no study systematically assessing the impact of preoperative factors on postoperative outcome following hysterectomy for benign uterine diseases so far. Traditionally, assessments of the treatment success of surgical therapy are based on clinical parameters such as intraoperative blood loss, duration of the surgery, postoperative complication rates or the duration of postoperative hospitalization [4]. However, these parameters do not always reflect patient's subjective perception of the therapeutic success of the operation [5]. Therefore the so-called "patient-reported outcome measures" (PROMs) have gained more and more impact for assessment of the success of a surgical treatment over the last decade. This is a general term for various concepts to measure subjectively perceived and recorded health conditions such as patients' preferences, quality of life, patients' satisfaction or subjective awareness of clinical symptoms [6]. The aim of this study was to examine whether factors of the preoperative decision-making process for hysterectomy for benign uterine diseases have an impact on the postoperative treatment success as evaluated by patient-reported outcomes.

The variables postoperative quality of life, sexual function, and "subjective satisfaction with the surgical result" were assessed upon correlation with factors of the preoperative decision-making process. On the basis of previous publications, the covariables "interval between first counseling and decision to surgery", "subjectively perceived quality of the preoperative counseling", "certainty in the decision for the intervention", "person mainly responsible for election of hysterectomy mode" and "discussion of decision for surgery with others" were chosen for this purpose [2].

## Materials and Methods

In this prospective observational study all patients who underwent hysterectomy for benign uterine pathologies at the Department of Gynaecology and Obstetrics, Saarland University Hospital, Homburg, Germany between April 2011 and June 2013 were included. Three different techniques for hysterectomy were used: total laparoscopic hysterectomy (TLH), supracervical laparoscopic hysterectomy (LASH) and vaginal hysterectomy (VH). In previous work by our group it was shown that the techniques of hysterectomy examined in this study did not differ significantly with regard to postoperative quality of life and sexual function. For this reason operative technique was not considered as an influencing factor in this study [7]. The hospital's ethics board approved the study protocol. The following inclusion criteria were defined:

1. hysterectomy for benign pathologies
2. completely filled out questionnaire
3. "American Society of Anesthesiologists physical status classification" (ASA) status I to II assessed preoperatively by the anesthesiological faculty of our hospital.

The following conditions were defined as exclusion criteria:

1. refusal to participate in the study
2. additionally performed uni- or bilateral adnexectomy since this procedure can induce a postoperative decrease in libido in premenopausal patients [8]
3. extensive or deeply infiltrating endometriosis (stage IV according to Enzian score) [9]
4. chronic-pelvic pain syndrome defined as not menstruation-associated pelvic pain over a period of more than six months
5. severe intraoperative complications defined as iatrogenic injury to bladder, ureter, intestines or larger vessels for intraoperative conversion to laparotomy or abandonment of the intended surgical procedure
6. severe postoperative complications defined as grade IV or V complications according to the Clavien-Dindo classification for surgical complications [10].

All surgeries were performed in the hospital's Department of Gynaecology under general anesthesia by an experienced consultant or registrar. All patients received perioperative antibiotics, comprising a single-shot dose of cefuroxime (1.5 g i.v., Fresenius, Bad Homburg, Germany) and metronidazole (0.5 g i.v., Fresenius, Bad Homburg, Germany), and low-molecular-weight heparin as thromboembolism prophylaxis (Enoxiparin 40 mg s.c., once daily, Sanofi Aventis, Paris, France). Detailed descriptions of the surgical techniques employed can be found in previous publications of our group [7, 11]. Age at time of surgery, body mass index (BMI) and menopausal status as well as surgical parameters were extracted from the patients' records. Additionally the duration of surgery (from time of first skin incision to closure of all trocar sites), the pre- and postoperative haemoglobin concentrations, duration of postoperative hospitalization (first postoperative

day to day of discharge) and intra- and postoperative complications according to the Clavien-Dindo classification for surgical complications were recorded [10].

### Selection of the covariables

On the basis of previous publications, five influencing factors of the preoperative decision-making process were selected [2]. In detail, the parameters “interval between first counseling and decision to surgery”, “subjectively perceived quality of the preoperative counseling”, “certainty in the decision for the intervention”, “person mainly responsible for election of hysterectomy mode” and “discussion of decision for surgery with others” were chosen. The answer options for the questions concerning the covariables were grouped together into two or three main categories (● Fig. 1). In detail, the following response options were available: For the question “who contributed most to the decision for this surgical procedure?” the five possible answers were grouped into the two main categories “subjective self-determined decision” (patients who felt that they were subjectively involved in the decision process for the choice of surgical procedure or who subjectively believed that they alone had made the decision) and “Decision subjectively taken by others” (cases in which the decision for the surgical procedure was subjectively taken by a third person). For the question “how certain were you about your decision?” the possible answers were grouped together in the categories “certain about the decision” and “uncertain about the decision”. For the question “have you spoken with other people about your decision?” two groups were formed: “extensive discussions with others” (patients who spoke extensively with others about their decision) and “little discussions” (patients who spoke little or not at all with other people about their decision). For the covariable “subjectively perceived quality of the preoperative counseling” the possible answers were divided into the categories “subjectively insufficiently informed” and “subjectively sufficiently informed”.

### Assessment of treatment success

Pre- and postoperative (6 months after surgery) quality of life, sexual function and postoperative patients' satisfaction with the results of the operation as assessed by patient-reported outcomes were evaluated as surrogate parameters for the postoperative treatment success. Sexual function and quality of life were assessed with two validated questionnaires, the female sexual function index (FSFI) and the EuroQuol-5D (EQ-5D) to assess the specific quality of life of an individual person. The FSFI is a validated multimodal survey tool to evaluate female sexual function [12]. The questionnaire consists of 19 individual questions on the topics lubrication, sexual arousal, orgasm, sexual satisfaction and pain. On the basis of the individual answers a specific FSFI value is calculated. Between 2 and 36 points can be obtained. The EQ-5D health questionnaire is a validated health questionnaire to assess the health-related quality of life of an individual person [13]. The questionnaire consists of two parts, the first descriptive part deals with the five dimensions of quality of life (mobility, self-care, usual activities, pain/discomfort and anxiety/depression). There are three possible responses for each dimension (no problems, minor problems, major problems) to choose from. Using the time tradeoff (TTO) method, an age- and ethnicity-specific EQ-5D index score (range: 1, full quality of life, to -0.207, worst health status) is calculated for each patient. The second part of the questionnaire comprises a vertical visual analog scale (VAS)

Who contributed most to the decision for this surgical procedure?	
Myself alone	Subjectively self-determined
Myself and my gynaecologist together	
Myself and the hospital together	
My gynaecologist	Decision subjectively taken by others
The hospital	
How much time did you need to make the decision for surgery?	
>6 months	> 6 months
1–6 months	1–6 months
1–4 weeks	< 1 month
≤ 1 week	
How certain were you about your decision?	
Very certain	Certain
Certain	
So/so	Uncertain
Hardly	
Not at all certain	
Have you spoken with other people about your decision?	
Very often	Extensively
Often	
Sometimes	Little
Hardly	
Not at all	
What do you think about the preoperative conseling?	
Very good	Subjectively sufficient
Good	
So/so	Subjectively insufficient
Poor	
Very poor	

**Fig. 1** Questions about factors of the preoperative decision-making process.

ranging from “optimal health status” (100 points) to “worst health status” (0 points).

For evaluation of the variable “subjective patient satisfaction with the result of the operation” a self-developed questionnaire was used. This is a “self-assessment sum score” that was validated in previous work by this group and allowed for values between 5 points (minimum score) and 40 points (maximum score) [14, 15]. The respective difference values (Diff) between the pre- and postoperative FSFI, EQ-5D scores results were then calculated.

### Statistical analysis

To investigate the relationship between the covariables and the treatment success, the pre- and postoperative FSFI-, EQ-5D, VAS and satisfaction scores for the individual covariable subgroups were compared in an univariate analysis. First, the normality of data distributions was assessed using the Kolmogorov–Smirnov

**Table 1** Patient characteristics and surgical outcomes (SD: standard deviation); \* postoperative complications recorded according to the Clavien-Dindo classification for surgical complications [9].

	Supracervical hysterectomy (LASH) n = 72	Total laparoscopic hysterectomy (TLH) n = 98	Vaginal hysterectomy (VH) n = 67	p
	Mean (SD)	Mean (SD)	Mean (SD)	
Age (years)	46.76 (6.71)	45.32 (8.23)	47.62 (9.41)	0.12
Body mass index (BMI; kg/m <sup>2</sup> )	26.93 (6.57)	28.17 (7.16)	26.14 (5.92)	0.66
Duration of operations (min)	114.66 (49.52)	122.73 (53.26)	73.13 (36.35)	≤ 0.01
Pre-postoperative haemoglobin concentration (g/dL)	1.57 (0.770)	1.48 (0.61)	1.69 (0.83)	0.91
Length of hospitalisation (days)	4.18 (1.97)	4.12 (1.13)	4.57 (1.81)	0.08
	n	n	n	
Postoperative complications (Clavien-Dindo)*				
▶ Grade I–II	2	3	4	–
▶ Grade III	1	1	3	–
▶ Grade IV–V	0	0	0	–

test. As the data were not normally distributed, the Kruskal–Wallis one-way analysis of variance and the Mann–Whitney U-test with post hoc Bonferroni correction were used for further calculations. A p value of < 0.05 was considered to be significant. In a second step the covariables were correlated with the difference values of the FSFI, EQ-5D, VAS and satisfaction score results in a multiple linear regression analysis. The covariables exhibiting an association with the collected patient-reported outcomes were identified stepwise by forward and backward selection. The tables in the results section show the covariables for which a correlation with the respective FSFI, EQ-5D, and VAS difference values or the postoperative satisfaction score was found by multiple linear regression analyses. In the forwards and backwards selection the list-wise case exclusion involved a 2-sided significance level of 10%.

Data were collected in an Excel database (Excel 2010, Microsoft Corporation, Redmond, WA, USA), and statistical calculations were performed with IBM SPSS software (v. 23; SPSS Inc., Chicago, IL, USA).

## Results

Of the 434 patients initially included in the study, 32 were excluded from participation because of severe intra- or postoperative complications. Of the 402 questionnaires dispatched postoperatively, 255 patients responded (response rate 63%). Eighteen patients were excluded due to incompleteness of questionnaires, leading to 237 patients for the final analysis. 98 patients (42%) were treated with TLH, 72 with LASH (30%) and 67 (28%) with VH. The main indications for hysterectomy were uterus myomatous (61%), endometriosis (11%), cervical dysplasia (5%) and other benign uterine pathologies (8%). The most frequent preoperative symptoms were dysfunctional bleeding disorders (48%), lower abdominal pain (37%) and pain radiating to the lumbal and/or sacral region (14%). Patients' characteristics and surgical parameters are presented in **Table 1**. With the exception of the duration of surgery which was significantly shorter (73.13 ± 36.35 minutes) in the VH group (p ≤ 0.01) compared to the two laparoscopic hysterectomy procedures (TLH 122.73 ± 53.26 minutes; LASH 114.66 ± 49.52 minutes), there were no significant differences between the three surgical procedures (**Table 1**). The pre- and postoperative number of patients living

in a relationship did not differ significantly (206 [87%] vs. 208 [88%] [p = 1]).

### Covariable “Person mainly responsible for election of hysterectomy mode”

For the question “Who contributed most to the decision for this surgical procedure?” 197 (83%) patients in the entire collective answered that they had made the decision “subjectively self-determined”. 40 patients (17%) stated that the decision was rather “subjectively taken by others”. With regard to the FSFI, EQ-5D and VAS results, there were no differences between the pre- and postoperative values of the two groups. In the multiple regression analyses there was no correlation between the decision making for surgery and the FSFI, EQ-5D, VAS difference values and the satisfaction score (**Tables 2 to 5**).

**Table 2** Multiple linear regression analyses for the correlation of the covariables and the FSFI differences (for the variables “person mainly responsible for election of hysterectomy mode”, “discussion with others” and “interval between first counseling and decision to surgery 1–6 months vs. > 6 months”, no correlation was found after forwards and backwards selection.

Variable	Regression coefficient B	p
<b>Certainty of decision</b>	2.30	< 0.05
Certain (vs. uncertain)		
<b>Subjectively perceived quality of counseling</b>	5.24	< 0.01
Subjectively sufficient (vs. subjectively insufficient)		
<b>Interval between first counseling and decision to surgery</b>	– 2.95	< 0.01
< 1 month (vs. > 6 months)		

### Covariable “Certainty of decision”

For the question “How certain were you about your decision?” 190 patients (81%) answered that they were “certain” about their decision and 46 patients (19%) that they were “uncertain”. With regard to the pre- and postoperative FSFI, EQ-5D and VAS values, there were no significant differences between the two groups. In multiple regression analysis there was a correlation between the “certainty of decision” and the FSFI difference values (regression



**Table 3** Multiple linear regression analyses for the correlation of the covariables with EQ-5D differences (for the variables “person mainly responsible for election of hysterectomy mode”, “certainty of decision”, “subjectively perceived quality of the preoperative counseling”, “discussion with others”, and “interval between first counseling and decision to surgery 1–6 months vs. > 6 months”, no correlation was found after forwards and backwards selection).

Variable	Regression coefficient B	p
Interval between first counseling and decision to surgery < 1 month (vs. > 6 months)	– 0.7	0.03

coefficient B 2.3 [ $p < 0.05$ ]; [Table 2](#)) and the satisfaction score values (regression coefficient B 3.3 [ $p < 0.01$ ]; [Table 5](#)).

### Covariable “Discussion of decision for surgery with others”

For the question “Have you spoken with other people about your decision?” 100 patients (42%) reported that they had spoken extensively with other people about their decision for the operation and 137 patients (58%) stated that they had not spoken much about the operation. With regard to the comparison with the FSFI, EQ-5D, VAS and satisfaction score values, no significant differences between the two groups were found for any of the investigated parameters.

### Covariable “Subjectively perceived quality of the preoperative counseling”

For the question “What do you think about the preoperative counseling?” 200 patients (84%) reported that they felt they had been “subjectively sufficiently counseled” and 37 patients (16%) that they had been “subjectively insufficiently counseled”. For the pre- and postoperative FSFI, EQ-5D and VAS values, no significant differences between the two groups were found. The multiple regression analysis showed correlations between “subjectively sufficient counseling” and higher FSFI (regression coefficient B 5.23 [ $p < 0.01$ ]; [Table 2](#)), VAS difference value (regression coefficient B 20.31 [ $p < 0.01$ ]; [Table 4](#)) and high postoperative satisfaction score results (regression coefficient B 1.77 [ $p < 0.05$ ]; [Table 5](#)).

**Table 4** Multiple linear regression analyses for the correlation of the covariables with VAS differences (for the variables “person mainly responsible for election of hysterectomy mode”, “certainty of decision”, “discussion with others”, and “Interval between first counseling and decision to surgery 1–6 months vs. > 6 months”, no correlation was found after forwards and backwards selection).

Variable	Regression coefficient B	p
Subjectively perceived quality of counseling Subjectively sufficient (vs. subjectively insufficient)	20.31	< 0.01
Interval between first counseling and decision to surgery < 1 month (vs. > 6 months)	– 9.12	0.01

### Covariable “Interval between first counseling and decision to surgery”

For the question “How much time did you need to make the decision?” 126 patients (53%) answered that they needed less than a month (< 1 month), 61 patients (26%) that they needed one to six months (1–6 months) and 50 patients (21%) stated that they needed more than six months (> 6 months) to come to a decision. No significant differences between the difference values for the individual groups were found in the univariate analysis.

In the multiple regression analyses a negative correlation was found between the variable “interval between first counseling and decision to surgery < 1 month” and the FSFI (regression coefficient B –2.95 [ $p > 0.01$ ]; [Table 2](#)), EQ-5D (regression coefficient –0.7 [ $p = 0.03$ ]; [Table 3](#)) and VAS difference values (regression coefficient B –9.12 [ $p = 0.01$ ]; [Table 4](#)) in comparison to “interval between first counseling and decision to surgery > 6 months”. For the satisfaction score, a negative correlation with the variable “interval between first counseling and decision to surgery 1–6 months” in comparison to “> 6 months” (regression coefficient B –2.09 [ $p < 0.01$ ]; [Table 5](#)) was found.

**Table 5** Multiple linear regression analyses for the correlation of the covariables with the postoperative satisfaction score values (for the variables “person mainly responsible for election of hysterectomy mode”, “discussion with others”, and “interval between first counseling and decision to surgery 1–6 months vs. > 6 months” no correlation was found after forwards and backwards selection).

Variable	Regression coefficient B	p
Certainty of decision Certain (vs. uncertain)	3.33	< 0.01
Subjectively perceived quality of counseling Subjectively sufficient (vs. subjectively insufficient)	1.77	< 0.05
Interval between first counseling and decision to surgery < 1 month (vs. > 6 months)	– 2.09	< 0.01

## Discussion

In this observational study we found that parameters of the preoperative decision-making process can influence the postoperative outcome of elective interventions as shown here for the case of hysterectomy for benign uterine pathologies with regard to quality of life, sexual function and patient satisfaction.

In detail, “the certainty of the decision”, the “subjectively perceived quality of the preoperative counseling”, and “the interval between first counseling and decision to surgery” were identified as influencing parameters. For the covariables “person mainly responsible for election of hysterectomy mode” and “discussion of decision for surgery with others”, no correlation with the postoperative outcome was observed. Two current studies found similar results. Hempowicz et al. found a relationship between the certainty of the decision in favour of an operation and the postoperative patients’ satisfaction for patients who underwent laparoscopic myomectomy [2]. This result is in accordance with our findings. Beside patient satisfaction, a better postoperative sexual function was observed for patients who were certain about

their decision for surgery in comparison to the group of patients who were uncertain about their decision in our collective. Pellino et al. demonstrated that this certainty in decision for an operation could be positively influenced by preoperative medical consultations and the amount of information provided [18]. Giving these findings, this result is particularly relevant since consequences can be drawn from this outcomes which might help to optimize preoperative medical counseling. The group of Groff et al., who investigated factors relevant for decision-making prior to hysterectomy in a prospective study. They reported the desire for extensive preoperative counseling about the surgery, an informed-consent and the possibility to discuss the operation with close friends or relatives as important factors [15]. The great importance of discussion of decision for surgery with others seen in this cohort could partly be explained by very negative attitude towards the consulting physician. The majority of the trial collective admitted to have very little trust or even no trust at all in the treating doctor. For the patient-reported outcomes assessed in this study, there were no significant differences between the group that had discussed their decision with other people extensively and the group that had hardly or not discussed their decision with other people. With regard to the quality of the medical information, we found better postoperative sexual function, quality of life (VAS) and patient satisfaction in the group of “subjectively sufficiently counseled” patients in comparison to the group of “subjectively insufficiently counseled” patients. A possible explanation for this could be that those patients who felt that they had been adequately informed were more certain of their decision, a factor which according to our results did positively influence the postoperative outcome. Furthermore, sufficient information about the postoperative course, postoperative limitations and the result to be expected can help avoid false expectations and postoperative disappointment. Etchells et al. have demonstrated that an intensive, standardised preoperative medical counseling leads to an improvement in the expectations about the surgical outcome and reduces the anxiety about the operation in the case of elective cardiac interventions [18]. For the covariable “person mainly responsible for election of hysterectomy mode” our analysis did not reveal a correlation with the assessed postoperative treatment outcomes. In contrast Allison et al. showed that involvement of the patients in the preoperative decision-making process concerning the respective treatment procedure resulted in a higher compliance and patients’ satisfaction in a collective of young patients with chronic inflammatory bowel disease who had to undergo surgery [16]. Possible reasons for these divergent results could be explained by the composition of the investigated collectives and in the nature of the investigated intervention. The collective investigated by Allison et al. consisted of young male and female adults aged 18–25 years and the intervention to be performed comprised an emergency operation with the possibility of construction of an anus praeter due to chronic inflammatory bowel disease. Our collective consisted exclusively of female patients between 34 and 52 years who had decided to undergo hysterectomy for benign uterine pathologies. Despite the emotional involvement which can be caused by a hysterectomy [17], it appears that for this elective intervention the possibility to take part in the choice of surgical procedure is of secondary importance for the patients. A sufficient preoperative counseling and enough confidence in the decision for surgery seem to be more important factors in this setting. Both factors might facilitate preoperative mental preparation for surgery and help coping with possible consequences [2].

Elective interventions such as hysterectomy for benign uterine pathologies are not performed as emergency procedures or with high priority, thus the question arises in clinical routine which time interval between the first explanation of therapeutic options and description of the surgical procedure to performance of the operation should be kept. In our cohort we found a negative correlation between “interval between first counseling and decision to surgery < 1 month” and improvement in postoperative sexual function and quality of life in comparison with the group “interval between first counseling and decision to surgery > 6 months”. For example those patients who required less than one month to decide in favour of an operation showed a 2.95-fold lower FSFI difference than those patients who took more than six months for the decision. A comparison of the time periods 1–6 months and > 6 months did not reveal any differences for the three assessed patient-reported outcomes. For the postoperative satisfaction score, there was a negative correlation between the time period 1–6 months and the postoperative satisfaction score in comparison to the time period > 6 months. Thus, the patients who required more than six months to come to a decision were significantly more satisfied with the surgical outcome than those who required 1–6 months.

A possible explanation for these findings could be that the patients who required a longer time period for decision making have the possibility to obtain more extensive information and are thus more certain about their final decision. Etchells et al. showed that patients are able to perceive more information with an increasing number of preoperative consultations [18]. These findings are especially interesting for the preoperative counseling of patients and might help to answer the question which time period is appropriate before taking the decision for such interventions and to specify the term “appropriate preoperative time for consideration” required in the new guideline of the German Society of Gynaecology and Obstetrics (Deutsche Gesellschaft für Gynäkologie und Geburtshilfe) [3]. A further interesting aspect arising from these results is the role of the local gynaecologist in this decision-making process. Since the optimal time period for making a decision in our study was more than six months a period during which most of the patients have not yet presented to the hospital, this further emphasises the importance of the local gynaecologist for providing sufficient counseling.

The results of this study demonstrate that the preoperative decision-making process can influence the postoperative outcome with regard to postoperative sexual function, quality of life and patient satisfaction. Preoperative counseling, informed medical consent and the time period for taking the decision seem to be important. In detail, the results allow the following conclusions: an adequate time for reflection between diagnosis or indication for treatment and the actual decision for the intervention should be allowed. According to our results this “adequate time for consideration” should be at least more than one month. With regard to postoperative satisfaction with the operation even a period of more than six months could be of advantage. Rushed decisions should thus be avoided whenever possible. Further investigations in order to be able to better define the optimal time period would be worthwhile. A comprehensive consultation of the patients about the planned intervention seems to be of great importance for an optimal treatment outcome. Here further investigations are also needed to identify concrete factors and aspects which from the patient’s point of view contribute to a sufficient counseling. Within the framework of the preoperative counseling and consultations, it should be checked that the patient’s deci-

sion for the operation has been made with sufficient certainty. These findings could contribute to a long-term improvement in postoperative outcomes of elective interventions such as, for example, hysterectomy, through optimisation of the identified aspects and thus should be implemented in clinical routine. The main focus of attention in the improvement of patient care generally lies in optimisation of inpatient care as well as surgical treatment. According to our data, however, preoperative components are also important possible targets for optimising the treatment outcome. Improvements in this area are relatively simple to perform and low in cost and should, above all, address the medical counseling and informed consent discussions. These findings can only be transferred to other surgical procedures with limitations since hysterectomy can be a very emotional procedure for patients and therefore additional factors might alienate the preoperative decision making process and the postoperative outcome which do not play a role in the course of other interventions [2,17]. A systematic investigation of the questions addressed in this study for other gynaecological interventions thus seems to be worthwhile.

The response rate to the questionnaire used in this study must be considered as a limitation. It appears to be moderate with 63% at first sight but in comparison with other studies using a similar study design this value is within normal range. Hempowicz et al. reported a response rate of 38.2% for a survey of female patients undergoing laparoscopic myomectomy using the FSFI and in our own group's preliminary studies with a similar collective a response rate of maximal 63% was seen [2,6]. This is most probably due to the intimate nature of the FSFI questionnaire.

The preoperative parameters identified in this study to have an influence on the postoperative outcome should also be analysed in more detail. With the factors "quality of the preoperative counseling" and "certainty in the decision for the operation", we have identified two factors of the preoperative work-up. Improvements in these two factors could possibly increase the postoperative patients' satisfaction. However the questions remain unsolved which factors help to turn a preoperative counseling into a subjectively perceived sufficient counseling, by which means certainty in the decision for surgery can be increased, and if there are assessment tools which might be able to measure preoperative confidence in the decision for surgery. This provides opportunities for further systematic investigations.

## Practical Conclusions

▼ In this observational study we showed that factors of the preoperative decision-making process can influence the postoperative outcome of elective interventions such as hysterectomy for benign uterine pathologies with regard to quality of life, sexual function and patient satisfaction to a significant extent. The quality of the preoperative counseling and informed consent discussions, the certainty of the decision and a sufficient time period for decision making seem to be particularly important. Improvement of these parameters in clinical routine could lead to an optimisation of treatment outcomes.

## Conflict of Interest

▼ The authors declare that they have not received financial support from any companies of relevance for the present publication.

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