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Do expectations determine postoperative disability in women with endometriosis? Study protocol for a clinical mixed-methods observational cohort study

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ABSTRACT

Introduction Overall, 20%–30% of women with endometriosis report endometriosis-related disability after successful laparoscopy. This indicates a potential impact of psychological factors, such as expectations, on treatment outcomes. It is already known that expectations determine treatment outcomes in various health conditions, such as cardiologic or gynaecology. Therefore, we investigate the impact of expectations and other psychological factors on patients' course of treatment outcomes after laparoscopy.

Methods and analysis A longitudinal mixed-methods study with N=300 women treated at a specialised centre of surgical endoscopy and endometriosis will be conducted with one preoperative and eight postoperative assessments of endometriosis-related disability and a priori specified predictors such as expectations. Additionally, two subsamples (each ~n=30) will be either interviewed about their endometriosis-related disability, expectations, and experiences of laparoscopy before and after surgery or asked once per day for 30 consecutive days using ambulatory assessments. Quantitative data will be analysed using multilevel modelling for longitudinal data. Structural content analysis will be used for qualitative data.

Discussion To optimise treatment for women with endometriosis, it is essential to understand how treatment expectations and other psychological and medical factors influence treatment outcomes after laparoscopy.

Ethics and dissemination The Ethics Committee of the Psychotherapeutenkammer Hamburg, Germany, gave ethical approval (ROXWELL-2021-HH, 25 June 2021).

Trial registration number ClinicalTrials.gov Registry (NCT05019612).

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ A mixed-methods study, which includes a clinical cohort, an ambulatory study and an interview-based qualitative module.
⇒ This study follows a large sample (N=300) of women with endometriosis before and 12 months after laparoscopic surgery.
⇒ A priori specified psychological and medical endometriosis-related factors are analysed simultaneously to predict postoperative disability.
⇒ This naturalistic, observational approach is ecologically valid, as it documents clinical procedures in unselected patients and surgeons within a certified centre of surgical endoscopy and endometriosis.
⇒ Generalisation of results may be limited due to recruitment at only one certified centre of surgical endoscopy and endometriosis in Germany.

INTRODUCTION

Expectations determine treatment outcomes in various medical fields.[1] Meta-analytical evidence indicates that preoperative expectations significantly impact the postoperative quality of life, independent of the type of surgery.[2] Consequently, understanding and optimising treatment expectations have become more relevant for different medical conditions.[3 4]

Endometriosis is one of the most common chronic diseases in women of procreative age and is very burdensome. The pooled prevalence is 4.4% in the general female population.[5] It is suggested that 23.8% of infertile women have endometriosis.[5] Women with endometriosis are primarily impaired by dysmenorrhoea, pelvic pain, dyschezia, dysuria or pain during sexual intercourse. In addition, daily activities, self-care and physical functioning, such as sleeping or morbidity, are negatively affected,[6] leading to disruptions to personal identity and feelings of being a burden to loved ones. Furthermore, women with endometriosis more often develop depression and anxiety disorders than women without endometriosis.[7] Overall, affected women's physical and mental quality of life and social well-being are diminished.[8 9]

According to the evidence-based S2k-treatment guidelines for endometriosis in Germany, Austria and Switzerland, laparoscopic surgery and subsequent endocrine pharmacotherapy are the recommended therapies when endocrine therapy has failed.[10] Laparoscopy is a low-risk, minimally invasive surgery performed in the pelvis using small incisions. With the initiation of carbon dioxide and the aid of a laparoscope, surgeons view the affected area in real time and completely resect endometriotic tissue with small surgical instruments. Laparoscopy is performed under general anaesthesia. Successful laparoscopy (ie, when all affected tissue was removed) is associated with considerable short-term improvement of symptoms and quality of life.[11–14]

Nevertheless, 20%–30% of treated women (so-called non-responders) still report symptoms and disability after surgery,[11 15] which is not explained by laparoscopy itself or a recurrence of endometriosis.[15] These findings support the stated independence of subjective symptom disability and medical factors such as rARSM stadium or the presence of deep infiltration of endometriosis.[16] Therefore, laparoscopy responses may be affected by psychological factors in addition to medical ones. Depression, anxiety, pain catastrophising and younger age are relevant biopsychosocial predictors for persistent complaints in women with endometriosis.[15 17 18] However, these factors do not explain symptom persistence entirely. Treatment expectations are one promising candidate to fill this research gap. Positive effects brought upon by positive expectations or other psychological factors and not by biomedical factors of the treatment itself are called placebo effects, whereas negative effects brought upon by negative expectations, anxiety or other psychological factors and not by the treatment itself are called nocebo effects. Placebo-response rates of up to 32% have been documented in women with endometriosis following a sham laparoscopy.[11] Furthermore, supporting the influence of treatment expectations, a randomised experimental study showed no difference in pain improvement between women who just had a laparoscopy for biopsy extraction compared with women who had both a biopsy extraction and endometriosis excision in one step.[19] In other gynaecological settings, research also implies a remarkable impact of expectations on treatment outcomes, such as quality of life in women with breast cancer.[3] Likewise, this suggests a potentially important role of expectations for treating endometriosis, especially, considering nocebo effects due to unfavourable expectations may have a vital role in understanding the persistence of endometriosis-related disability postoperatively.[20] Up to date, no study has investigated nocebo effects in women with endometriosis.

Objectives and research questions

To the best of our knowledge, this is the first study to investigate the prospective influence of expectations and other psychological factors on patients' course of endometriosis-related preoperative pain disability, symptoms, quality of life and well-being after laparoscopy.

According to the presented theoretical background and objectives, the following research questions will be addressed using a mixed-methods study design (clinical cohort study, embedded interview and diary modules).

Clinical cohort study

1. Do preoperative expectations influence postoperative endometriosis-related disability?
   H1: Participants with more negative preoperative expectations report significantly more postoperative endometriosis-related disability.
2. Do psychological factors (ie, endometriosis-related preoperative pain disability, depressive mood, anxiety, pain catastrophising) impact postoperative endometriosis-related disability?
   H2a: Participants with higher preoperative levels of depression and anxiety report significantly more postoperative endometriosis-related disability.
   H2b: Participants with higher preoperative pain catastrophising report significantly more postoperative endometriosis-related disability.
3. Do medical factors (ie, rARSM stadium, deep infiltration of endometriosis, duration of endometriosis symptoms) impact postoperative endometriosis-related disability?
   H3: Defined medical factors do not impact postoperative endometriosis-related disability.
4. Which patients with endometriosis have unfavourable preoperative treatment expectations?
5. How do endometriosis-related disability and postoperative expectations develop over 12 months following laparoscopy?
6. Do postoperative expectations impact postoperative endometriosis-related disability or vice versa?

Embedded interview module

1. Which endometriosis-related complaints and disability do participants name?
2. Which changes in endometriosis-related complaints and disability and quality of life do participants expect and experience after laparoscopy?
3. Which positive and negative expectations do participants name regarding laparoscopy?
4. Which individual beneficial and obstructive factors for treatment outcomes do participants name?

Embedded diary module (explorative)

1. How stable are postoperative endometriosis-related disability and complaints in everyday life?
2. How stable are postoperative expectations in everyday life?
3. Are postoperative expectations associated with postoperative endometriosis-related disability and complaints?
4. Are more negative preoperative expectations or other potential influencing preoperative factors associated with more postoperative endometriosis-related disabilities and complaints?

METHODS AND ANALYSES

Study design

A mixed-methods, clinical observational cohort study will be conducted with patients undergoing laparoscopic surgery for endometriosis. The study includes (1) a 12-month clinical cohort study with one preoperative and eight postoperative assessments, (2) an embedded two-step qualitative interview module with audio recordings and (3) an embedded ambulatory smartphone-based diary module.

Participants

The target population are women (N=300) with a clinical indication for laparoscopy according to endometriosis-related complaints with or without an unmet wish to have children.

Recruitment

Clinical cohort study

Participants will be recruited by a specialised centre of surgical endoscopy and endometriosis (Frauenklinik an der Elbe, Germany). Women with an appointment for laparoscopy and sufficient German language skills will be informed about the study by the receptionists of the ambulatory clinic and study psychologists by telephone.

Embedded study modules

Eligible and consenting patients will be informed about the interview and diary modules after completing the clinical cohort study's baseline assessment (see the Procedure section). Interested women enter their contact data and will be contacted by the study team for an interview appointment.

Inclusion and exclusion criteria

Participants have to fulfil the following criteria to be included in the clinical cohort study and the embedded interview and diary modules: (1) age of 18 years at least, (2) endometriosis-related complaints with or without an unmet wish to have children, (3) good speaking and comprehension of the German language, (4) female sex, (5) informed consent for study participation, (6) indication for laparoscopy and (7) visually diagnosed endometriosis by clinicians. Exclusion criteria are (8) incomplete excision of endometrial tissue and (9) malignant biopsy result of endometrial tissue.

Power analysis

The required sample size was estimated a priori using the software G*Power.[21] Based on the meta-analysis of Auer *et al*,[2] reporting a small to a medium association between preoperative expectations and postoperative quality of life, we expected (1) a small to medium effect size for the main effect of preoperative expectation and (2) a small effect size for the interaction of preoperative expectations and time course over 26 weeks on endometriosis-related disability (primary outcome) in our study. As an approximative power analysis for individual growth modelling, we determined that a number of 287 participants would provide 90% power to detect an effect f^2=0.03 in a multiple linear regression with 20 predictors and an α error rate of 0.05. Given that 20%–30% of women are non-responders,[11 15] n=60–90 women are expected to report persisting symptoms and disability after laparoscopy. We assumed an attrition rate of 10% to obtain a rounded required sample size of N=330.

Procedure

Clinical cohort study

The assessments will be conducted online over 12 months, including one preoperative baseline assessment (T_0), seven postoperative monthly assessments (T_1–T_7) and a follow-up assessment (T_8) at 54 weeks (ie, 12 months) after laparoscopy (see figure 1). In addition, surgeons will document endometriosis-related medical characteristics

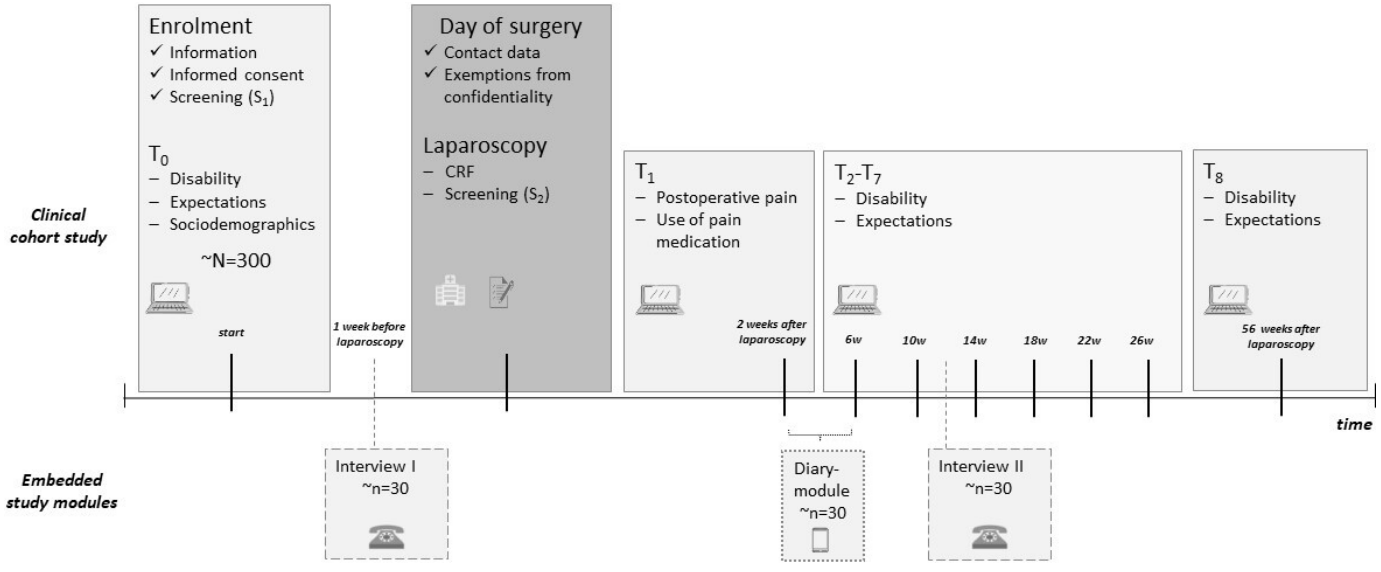

Figure 1 Schedule of the clinical cohort study and embedded interview and diary modules. CRF, case report form.

and relevant information about surgery within a case report form (CRF).

First, eligible women receive the link to the baseline assessment (T_0) with their confirmation date for laparoscopy by receptionists of the endometriosis centre. Study information is given after clicking on this link, and study-related questions are answered via telephone or email by the study team. Second, written online informed consent is obtained. Third, eligibility criteria (eligibility screening S_1) are confirmed: age of 18 years and older and endometriosis-related complaints with or without an unmet wish to have children. Fourth, participants complete the baseline assessment (T_0) (lasting approximately 15–20 min). On the day of surgery, participants receive written study information, provide contact data and sign an exemption from confidentiality for the CRF. After the laparoscopy, surgeons fill out the CRF, which is used for the second screening (eligibility screening S_2). Participants ultimately remain included if the following criteria are fulfilled: visually diagnosed endometriosis, complete excision and benign histology. Participants who do not fulfil the S_2 criteria will be excluded from the study. A total of eight postoperative assessments take place at the measuring points 2 weeks (T_1), six times 4 weekly (T_{2-7}), including the primary endpoint at T_7 and 54 weeks as a follow-up (T_8) after surgery (each lasting approximately 5–8 min).

Embedded interview module

The interview module takes place 1 week before (preoperative, interview I) and 2.5 months after laparoscopy (postoperative, interview II). Each interview lasts approximately 20–25 min and is audio recorded by study psychologists.

Embedded diary module

The 30-day diary module starts 2 weeks after laparoscopy. Participants will be prompted every evening for 30 consecutive days to rate their endometriosis-related complaints, disability, pain medication and expectations using single items (lasting approximately 3 min). The diary assessment starts and ends with a status measurement ($T1_a$ and $T1_b$, respectively). Assessments will take place with a customised smartphone application (m-Path) that will be applied to personal or study-provided smartphones, depending on participants' preferences.

Quantitative measures

Primary outcome measure

Endometriosis-related pain disability will be assessed by the German version of the Pain Disability Index (PDI-D).[22 23] The PDI-D assesses the self-reported pain disability and comprises seven items with 11 response options (0=no disability to 10=total disability). The PDI-D was adapted to endometriosis-related disability for this study. The total score ranges from 0 to 70; higher sum scores indicate a higher disability due to pain. Good reliability has been proven, ranging from Cronbach's α=0.86–0.90.[22 23] The PDI-D will be assessed at the measuring points T_0 and T_{2-8}.

Secondary outcome measures

The severity of endometriosis-related symptoms will be assessed by five self-conducted items using Numerical Rating Scales ($NRS_{symptom}$), as recommended for pain related to endometriosis in a systematic review by Bourdel *et al*.[24] The $NRS_{symptoms}$ comprise the five most prevalent endometriosis symptoms (dysmenorrhoea, pelvic pain, dyspareunia, dyschezia, dysuria) with 11 response options (0=no pain to 10=worst pain imaginable).

Women's mental well-being will be assessed by the Short Warwick-Edinburgh Mental Wellbeing Scale (SWEMWBS).[25] The SWEMWBS comprises seven thoughts and feelings with five response options (1=never to 5=always). The total score ranges from 7 to 35; higher sum scores indicate a higher level of mental well-being. Cronbach's α was 0.84–0.86 for the total score.[26]

Women's health-related quality of life will be assessed by the Endometriosis Health Profile (EHP-5).[27] The EHP-5 measures the effects of endometriosis on women's life, covering five items with five response options (0=never to 4=always). The total score ranges from 0 to 20; higher sum scores indicate a higher level of self-reported impairment. Cronbach's α was 0.83–0.93 for the total score.[27]

Current treatment effects will be assessed by the Generic Rating Scale for Treatment Effects ($GEEE_{ACT}$).[28] The $GEEE_{ACT}$ assesses present treatment effects on endometriosis-related complaints using three items with 11 response options (0=no improvement/worsening/complaints to 10=greatest improvement/worsening/complaints imaginable). The $GEEE_{ACT}$ will be assessed postoperatively at the measuring points T_{2-8}. The other secondary outcomes will be assessed at T_0 and T_{2-8}.

Predictors and other predefined measures

Treatment expectations about laparoscopy will be assessed by the Treatment Expectation Questionnaire (TEX-Q)[29] and the Generic Rating Scale for Treatment Expectations ($GEEE_{EXP}$).[27] The TEX-Q assesses patients' self-reported treatment expectations and consists of 15 items covering six dimensions (eg, treatment benefit, adverse events) that are presented on 11-point Likert scales. For all required analyses, mean subscale scores and the mean total score, each ranging from 0 to 10, will be used. Higher scores indicate more positive treatment expectations, except for the subscales 'adverse events' and 'negative impact', where higher scores indicate more negative treatment expectations. The $GEEE_{EXP}$ assesses current experiences of treatment-related effects and consists of three items with 11 response options (0=no improvement/impairment to 10=greatest improvement/worsening imaginable; 0=no complaints to 10=greatest complaints imaginable). The TEX-Q and $GEEE_{EXP}$ will be assessed at baseline (T_0).

Expected endometriosis pain disability will be assessed by an adapted version of the $PDI\text{-}D_{expect}$.[22 23] The $PDI\text{-}D_{expect}$

assesses the expected endometriosis-related pain disability and consists of seven items with 11 response options (0=no disability to 10=total disability). The total score ranges from 0 to 70; higher sum scores indicate a higher expected disability due to pain. The PDI-D_{expect} will be assessed at the measuring points T_0 and $T_{2–8}$.

Women's symptoms expectations will be measured by a self-conducted $NRS_{symexpect}$. The $NRS_{symexpect}$ assesses the expected symptom severity of the five most prevalent endometriosis symptoms (dysmenorrhoea, pelvic pain, dyspareunia, dyschezia, dysuria) with 11 response options (0=no pain to 10=worst pain). The $NRS_{symexpect}$ will be assessed at the measuring points T_0 and $T_{2–8}$.

Pre-experiences with endometriosis laparoscopy will be assessed by the Generic Rating Scale for Previous Treatment Experiences ($GEEE_{pre}$).[28] The $GEEE_{pre}$ comprises three items and assesses prior treatment experiences, including improvement as well as worsening and potential side effects (0=no improvement/worsening/complaints to 10=greatest improvement/worsening/complaints imaginable). The $GEEE_{pre}$ will be assessed at baseline (T_0).

State depression and anxiety will be assessed by the Patient Health Questionnaire (PHQ-4).[30] The PHQ-4 assesses core symptoms of anxiety and depression and consists of four items with four response options (0=not at all, 1=several days, 2=more than half the days, 3=nearly every day). The total score ranges from 0 to 12, and the anxiety and depressive subscale scores range from 0 to 6 each. Higher sum scores indicate a higher level of depression and anxiety. Cronbach's α was 0.82 for the total score. The PHQ-4 will be assessed at baseline (T_0).

Pain catastrophisation will be measured by the subscale catastrophisation of the Coping Strategies Questionnaire ($CSQ_{paincatastrophising}$).[31] $CSQ_{paincatastrophising}$ comprises six items with seven response options (0=never do that to 6=always do that). A total sum score will be examined, ranging from 0 to 36; a higher sum score indicates a higher level of pain catastrophisation. Cronbach's α was 0.97. The $CSQ_{paincatastrophising}$ will be assessed at baseline (T_0).

Women's somatic symptom severity will be assessed by the PHQ-15.[32] The PHQ-15 consists of 15 physical symptoms with three response options (0=not at all to 2=bothered a lot). The total sum score ranges from 0 to 30; higher sum scores indicate a higher level of impairment. Cronbach's α was 0.80 for the total score.[32] The PHQ-15 will be assessed at the T_0 and $T_{2–8}$.

In addition, relevant sociodemographics (eg, age, profession, occupational disability, migrant background) will be assessed at baseline (T_0) and current pregnancy (self-constructed item; yes/no) at the measuring points T_0 and $T_{2–8}$.

Postoperative pain will be assessed by six self-constructed items with 11 response options (0=no pain/disability to 10=greatest imaginable pain/disability).

Medication will be assessed by three self-constructed items with free-text entries. One item refers to pain medication and two items to hormonal medication. Pain medication will be assessed at the measuring points T_0 and $T_{2–8}$.

Surgery information and endometriosis characteristics will be assessed by surgeons using a nine-item CRF, including surgery date, duration, intraoperative complications (Clavien-Dindo classification[33]), endometriosis classification (revised American Society for Reproductive Medicine (rASRM) Score, #Enzian classification[16]), endometriosis entities and postoperative treatment recommendations.

For an overview of all measures, see table 1.

Qualitative measures

A semistructured interview will be used for the embedded two-step interview module. The preoperative interview (interview I) comprises 14, and the postoperative interview (interview II) 16 open-ended questions referring to endometriosis-related disability, expectations and experiences of laparoscopy.

Statistical analyses

Clinical cohort study

Multilevel modelling for longitudinal data will be used to investigate and predict the course of primary and secondary outcomes over time (H1, H2a, H2b, H3). Measurement points are nested within participants. We examine the effects of predictors measured over time (level 1 predictors) and baseline (level 2 predictors). Level 1 predictors include time and symptom expectations (within-person and between-person effects). Level 2 predictors include treatment expectations, preoperative endometriosis-related disability, treatment pre-experiences, state depression and anxiety, pain catastrophisation, somatic symptom severity, the reason for laparoscopy, age (in years), pain catastrophisation, state depression and anxiety, and medical characteristics (rARSM stadium, deep infiltration of endometriosis, intraoperative complications, postoperative pain, medication and duration of endometriosis symptoms in years). The main effects of treatment expectations and their interaction with time are of particular interest regarding our primary and secondary outcomes. All predictors will be included as fixed effects; the time variables will serve as an additional random effect. Moreover, we include intercepts as fixed and random effects. Sensitivity analyses include a rerun of primary analyses deleting cases who (1) needed another surgery for a complete restoration, (2) gave baseline information on the surgery date as opposed to days or weeks before surgery, and (3) had missing data in the predictor variables.

In addition, we will identify women with unfavourable expectations at baseline (Q4) and conduct a longitudinal group-based trajectory model to replicate the three groups identified by Comptour *et al*[34] (no/no more prolonged pain, considerable improvement of pain, continued severe pain; Q5) and estimate a cross-lagged panel model to identify whether symptom expectations predict treatment outcome or vice versa (Q6).

Table 1 Schedule of enrolment and measures according to SPIRIT

	Time point											
	Enrolment and screening	Laparoscopy	Screening									
Assessments and measures	**$-T_1$ and S_1**	**T_0**	**S_2**	**T_1**	**EMA**	**T_2**	**T_3**	**T_4**	**T_5**	**T_6**	**T_7**	**T_8**
Study information	✓											
Informed consent	✓											
Eligibility screening S_1 (pre)	✓											
Eligibility screening S_2 (post)			✓									
Primary endpoint												
Endometriosis-related pain disability (PDI)		✓				✓	✓	✓	✓	✓	✓	✓
Total endometriosis-related pain disability (1 constructed item)					✓							
Secondary endpoints												
Endometriosis-related symptoms ($NRS_{symptoms}$)		✓				✓	✓	✓	✓	✓	✓	✓
Strongest endometriosis health-related pain intensity (1 constructed item)					✓							
Well-being (SWEMWBS)		✓				✓	✓	✓	✓	✓	✓	✓
Endometriosis-related quality of life (EHP-5)		✓				✓	✓	✓	✓	✓	✓	✓
Predictors and other predefined measures												
Current treatment effects ($GEEE_{treatmenteffects}$)						✓	✓	✓	✓	✓	✓	✓
Severity of somatic symptoms (PHQ-15)		✓				✓	✓	✓	✓	✓	✓	✓
Treatment expectations ($GEEE_{expectation}$, TEX-Q)		✓										
Symptom expectations ($NRS_{symexpect}$)		✓				✓	✓	✓	✓	✓	✓	✓
Expected strongest endometriosis-related pain intensity (1 constructed item)					✓							
Expected endometriosis pain disability ($PDI\text{-}D_{expect}$)		✓				✓	✓	✓	✓	✓	✓	✓
Expected total endometriosis-related pain disability (1 constructed item)					✓							
Treatment experiences ($GEEE_{pre}$)		✓										
Pain catastrophisation ($CSQ_{subscale}$)		✓										
State depression and anxiety (PHQ-4)		✓										
Sociodemographic factors (12 constructed items)		✓										
Pregnancy (1 constructed item)		✓				✓	✓	✓	✓	✓	✓	✓
Pain medication (1 constructed item)		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
Hormonal medication (2 constructed items)		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
Duration of symptoms		✓										
Postoperative pain (6 constructed items)				✓								
Case report form												
Surgery date and duration		✓										
Surgery complications (Clavien-Dindo classification)		✓										
Endometriosis entities		✓										
Endometriosis classification (rASRM-Score, #Enzian classification)		✓										
Postoperative treatment recommendation		✓										

✓, used; CSQ, Coping Strategies Questionnaire; EHP-5, Endometriosis Health Profile; EMA, Ecological momentary assessment; $GEEE_{pre}$, Generic Rating for Treatment Experiences; $GEEE_{treatmenteffects}$, Generic Rating for Treatment Effects; $GEEE_{treatmentexpect}$, Generic Rating for Treatment Expectations; NRS, Numerical Rating Scale; PDI, Pain Disability Index; PHQ-4/15, Patient Health Questionnaire; rASRM-Score, revised American Society for Reproductive Medicine Score; SPIRIT, Standard Protocol Items: Recommendations for Interventional Trials; SWEMWBS, Short Warwick-Edinburgh Mental Wellbeing Scale; TEX-Q, Treatment Expectation Questionnaire.

Before model calculations, metric predictors will be centred (grand mean). We will use Full Information Maximum-Likelihood estimation within the individual growth modelling to deal with missing values. Missing data of baseline predictors are expected to be low due to the mandatory online assessment and forced entry; if necessary, values will be imputed using the Expectation–Maximisation algorithm. All quantitative hypotheses are tested one sided with an α level of 0.05. Data will be analysed with IBM SPSS v.27 and R.

Embedded interview module

We will perform a structural content analysis guided by Kuckartz (2019)[35] in six stages. First, the recorded interviews will be transcribed literally. Second, we will develop a priori, primary categories referring to the interview questions. Third, transcribed interviews will be labelled by these primary categories. Fourth, labelled text units will be compiled for each primary category. Fifth, categories will be classified into subcategories by screening the text units within the primary categories to form a new comprehensive category system. Finally, the new category system will be applied to the whole transcribed material. To ensure the reliability of the analytical process, two researchers will discuss each analytical stage intensively. Afterwards, aberrance and congruence between the corresponding results will be addressed. Sampling will be performed until data saturation to ensure the credibility of the research data. The data processing will be conducted with MAXQDA software.

Embedded diary module

The course of endometriosis-related complaints, disability and expectations over 30 consecutive days will be analysed on a descriptive level and via multilevel modelling for longitudinal data. Measurement points are nested within participants.

Patient and public involvement

Patient representatives (ie, women with lived experience of endometriosis) were involved in the process of measurement selection, comprehensibility of study material and study planning process. The study material was shown to seven patients to evaluate choices of measurements, comprehensibility and time demand. Additionally, the results of analysed qualitative data will be discussed with a selection of interview study participants for member checking before publication. All interested participants receive suitably prepared information about the study results.

DISCUSSION

The primary aim of this study is to investigate the impact of psychological factors, especially expectations for treatment course and outcomes in women with endometriosis. Given the evidence for the impact of expectations on treatment outcomes[11 19] and recommendations for being mindful of placebo and nocebo effects,[36] this is the first study considering expectations for treatment outcomes in women with endometriosis. In this way, the study contributes to close large gaps in research and treatment for a highly prevalent and burdensome group of patients.[37]

Results of this mixed-methods clinical cohort study will lead to a better understanding of expectations, the course of the same and endometriosis-related disability after laparoscopy in women with endometriosis. Furthermore, our results might contribute to identifying and characterising risk groups for persistent postoperative endometriosis-related symptoms and modifiable mechanisms such as expectations. Evidence may be given to deduce complementary psychological interventions to the current treatment process to enhance the effectiveness of the same.[36] Psychological interventions addressing expectations have been already proven efficacious in optimising (treatment) expectations and subsequently improving treatment outcomes in patients with breast cancer[3] and hot flushes[38] or reducing postoperative days spent of patients undergoing elective cardiac surgery.[39] Women with persistent endometriosis-related complaints may especially benefit from psychological interventions such as expectations management training (EXPECT) by reducing potential nocebo effects and enhancing placebo effects to obtain better treatment outcomes.

ETHICS AND DISSEMINATION

The Psychotherapeutenkammer Hamburg, Germany, Ethics Committee gave ethical approval (ROXWELL-2021-HH). The trial is preregistered at ClinicalTrials.gov (ID NCT05019612).

Informed consent and exemption from confidentiality will be obtained from all participants. Participants will also receive a written exemption from confidentiality and an information sheet. Finally, the results will be proposed for publication in peer-reviewed journals.

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Competing interests None declared.

Patient and public involvement Patients and/or the public were involved in the design, or conduct, or reporting, or dissemination plans of this research. Refer to the Methods section for further details.

Patient consent for publication Obtained.

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