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Effects of a low-FODMAP diet on patients with endometriosis, a prospective cohort study

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Abstract

Background Patients with endometriosis often experience bowel symptoms such as changing stool, abdominal pain and bloating similar to those associated with irritable bowel syndrome. These symptoms reduce quality of life (QoL). Visceral hypersensitivity seems to be a shared pathogenic factor. The low-FODMAP (Fermentable Oligosaccharides, Disaccharides, Monosaccharides and Polyols) diet is a known visceral hypersensitivity targeted therapy with significant reduction in bowel symptoms. The aim of this study was to evaluate the effect of low-FODMAP diet on bowel symptoms such as constipation and bloating, pain and QoL in patients with endometriosis.

Methods The diet involved four weeks of FODMAP elimination, followed by a reintroduction-period of at least ten weeks, varying by patient. Questionnaires were sent at baseline and after these periods. The primary outcome was constipation change after the reintroduction period compared to baseline, assessed by Groningen-DeFeC-questionnaire (0–30 scale) with paired-T-test or Wilcoxon-signed-rank-test. Secondary outcomes included changes in bloating, QoL and abdominal pain, assessed by Endometriosis Health Profile-30 (EHP-30). P-value < 0,05 indicated statistical significance.

Results Forty-seven patients were included; thirteen withdrew before starting the diet, mostly due to lack of motivation. Of the remaining 34, 24 (71%) completed the diet (i.e. following the prescribed periods) Constipation scores improved significantly after low-FODMAP diet compared to baseline from 7.0 to 5.0 ($p = 0.023$). There was no significant difference observed in bloating, however 53% of patients that completed the diet mentioned a decrease. The following domains of the EHP-30 improved significantly: pain (from 47.8 to 29.2 ($p = 0.002$)), control and powerlessness (from 69.4 to 36.7 ($p = 0.000$)), emotional well-being (from 45.2 to 29.2 ($p = 0.001$)), social support (from 46.4 to 31.3 ($p = 0.0017$)), self-image (from 51.2 to 40.5 ($p = 0.035$)), work-life (from 35.0 to 21.7 ($p = 0.003$)) and sexual intercourse (from 61.6 to 45.7 ($p = 0.023$)). 65% of patients that completed the diet mentioned a decrease in pain, especially chronic pelvic pain.

Conclusions This study suggests the low-FODMAP diet may improve bowel symptoms and QoL in endometriosis patients motivated to follow the diet, highlighting its potential in endometriosis care. However, further research in larger populations is needed to explore factors like endometriosis type, pain intensity and dropout rates to confirm these findings.

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Trial registration ICTRP: NL-OMON28996: Feasibility study: The effect of the low FODMAP diet on women suffering from endometriosis (https://trialsearch.who.int/Trial2.aspx?TrialID=NL-OMON28996) on September 13th 2019.

Key message

This study shows in patients with endometriosis following the low-FODMAP diet a significant decrease in constipation scores and multiple domains of quality of life. It should be noted that these effects were observed in a motivated group that completed the diet. The low-FODMAP diet is a promising non-medical, self-management intervention in endometriosis care.

Keywords Endometriosis, Constipation, Bloating, Pain, Diet therapy, Low FODMAP diet, Self-management, Quality of life

Introduction

Endometriosis is a benign, chronic disease that is defined as the presence of endometrium-like tissue outside the uterine cavity causing a chronic inflammatory reaction [1]. Whilst not all patients are symptomatic, frequently presented symptoms are dysmenorrhea, chronic pelvic pain, dyspareunia, infertility and bowel symptoms. Up to 90% suffer from bowel symptoms like changing stool and bloated feeling [2]. Compared to controls, patients with endometriosis suffer from more severe abdominal pain, constipation, bloating and flatulence, impaired psychological well-being, influence of symptoms on daily life, defecation urgency, and sensation of incomplete evacuation [2]. Almost 30% of patients undergoing laparoscopy for suspected endometriosis experience constipation [3]. These bowel symptoms are similar to those typically associated with irritable bowel syndrome (IBS). Both diseases have a great impact on quality of life (QoL) [4, 5]. Patients with endometriosis have an approximately threefold increased risk of developing IBS [6]. Visceral hypersensitivity is a factor that seems to play a role in both endometriosis and IBS [7]. This is an increased sensitivity to pain signals from internal organs, resulting in lower pain thresholds. Studies on rectal distension show that individuals with IBS and individuals with endometriosis experience more pain compared to healthy individuals [7, 8]. Visceral hypersensitivity also might explain why patients with IBS or endometriosis sometimes experience chronic abdominal pain despite the severity of the disease and the absence of clear structural abnormalities [7, 9].

The low-FODMAP (Fermentable Oligosaccharides, Disaccharides, Monosaccharides and Polyols) diet is a known visceral hypersensitivity targeted therapy for IBS, with significant reduction in bowel symptoms [10, 11]. The diet involves elimination of poorly absorbed carbohydrates, reducing intestinal water volume and colonic gas production. Gastro-intestinal symptoms such as abdominal pain and a bloated feeling should diminish or even vanish because of reduction of intestinal luminal distension.

Since effective long-term treatment options for endometriosis remain limited, self-management strategies like dietary interventions are used to control symptoms of the disease [12].

Although limited data are available on the impact of dietary interventions such as the low-FODMAP diet on bowel symptoms in patients with endometriosis, some studies suggest promising results. A study using prospectively collected data found that the low-FODMAP diet significantly reduced bowel symptoms in patients with both IBS and endometriosis compared to those with IBS alone [13]. Additionally, a recent prospective study reported that adherence to the low-FODMAP diet or endometriosis diet (i.e. an experience-based diet that emphasizes anti-inflammatory, fiber-rich foods and limits processed foods, sugars, and dairy) resulted in improvements in pain, quality of life, and gastrointestinal symptoms compared to no diet [14]. More prospective studies will add evidence to this field. And, to our knowledge, the effect of the low-FODMAP diet on functional scores, like constipation, in endometriosis has never been studied before.

The previous results and common symptoms in IBS and endometriosis suggest that this diet could, non-invasively, result in bowel symptoms reduction in our population of patients with endometriosis, and therefore improve their QoL. The objective of this study is to evaluate the effect of the low-FODMAP diet on bowel symptoms such as constipation and bloated feeling, QoL and abdominal pain in patients suffering from endometriosis.

Methods

Study design

This single center prospective cohort study was carried out as a pilot study at the Máxima Medical Center, a teaching hospital in Veldhoven, the Netherlands. The study was registered prospectively on September 13th 2019 in the Dutch Trial Register (NL8022) and was conducted according to the principles of the Declaration of Helsinki and approved by the National Central Committee on Research involving Human Subjects (NL71354.015.19) and the medical ethical research

committee of the Máxima Medical Center (file number W19.080).

Study subjects

Patients were recruited at the gynecological outpatient clinic between May 2020 and July 2023.

The inclusion criteria were: (1) premenopausal and aged ≥ 18 years old; (2) diagnosis with endometriosis by physical examination, ultrasound, MRI or laparoscopy; (3) presence of debilitating bowel symptoms such as abdominal pain, bloating, flatulence, constipation, diarrhea, gurgling, urgency or nausea.

The exclusion criteria were: (1) postmenopausal or aged < 18 years old; (2) not able to speak, read or write Dutch; (3) gastro-intestinal co-morbidities such as food allergy, Crohn's disease, Ulcerative Colitis, Coeliac disease; (4) diagnosis with Diabetes Mellitus; (5) currently following another diet; (6) currently pregnant; and (7) planned for endometriosis surgery during the research period.

Patients meeting all the in- and exclusion criteria and willing to participate, signed informed consent and received a referral to an affiliated dietitian afterwards. The costs for guidance of the dietitian were covered by the Máxima Medical Center. Participants could withdraw from the trial at any time. If endometriosis surgery did occur during the study period, patients were excluded from the time of surgery.

Intervention

At baseline, all patients underwent an intake diet consultation by a trained FODMAP dietitian affiliated with the study. During this consult detailed information about the low-FODMAP diet was provided, including handouts with recipes, tips, and meal plans. Thereafter, the diet started with the 4-week elimination period in which all FODMAPs were eliminated from the diet. During this period, the dietitian called the patient to monitor their progress and answer questions. After completing the elimination period, patients were scheduled for a follow up consultation with the dietitian. Following the elimination period, there was a reintroduction period in which they reintroduced the FODMAPs that were restricted before. The FODMAPs were gradually reintroduced one at a time to identify specific triggers. The time required for this phase was determined based on the need for participants to adequately assess their responses and symptoms flare-ups to individual FODMAPs. Additionally, personal circumstances, such as lifestyle or individual preferences, may have influenced the amount of time needed for the reintroduction period. This period was therefore variable between the participants, but lasted for a minimum of 10 weeks. During the reintroduction period, multiple consultations took place, also depending on the time required for this period. The diet was considered finished once both the elimination- and the reintroduction period were completed, resulting in a minimum duration of 14 weeks. It was considered incomplete if patients themselves indicated that they had stopped the diet and no longer attended appointments with the dietitian.

Primary and secondary outcomes

The primary outcome was constipation after the diet, i.e. after the reintroduction period. The Constipation Scoring System, as described by Agachan et al. [15], was calculated using the answers to the validated Groningen DeFeC questionnaire [16]. Constipation scores ranged from 0 to 30, with 0 indicating normal and 30 indicating severe constipation. The secondary outcomes included bloating, QoL and abdominal pain post-diet. Bloating was assessed using the Groningen DeFeC questionnaire and the following question that was asked after the diet: 'Did the diet improve your bowel symptoms? If yes, which symptoms?' QoL was measured by the Endometriosis Health Profile-30 (EHP-30) [17]. The EHP-30 consisted of two parts: a core questionnaire, which is applicable to all patients with endometriosis, containing 30 items in five subscales (pain, control and powerlessness, emotional well-being, social support, and self-image) and a modular questionnaire, which does not necessarily apply to all patients with endometriosis, containing 23 items in six subscales (work, relationship with children, sexual intercourse, medical profession, treatment, and infertility). Answers of EHP-30 can be rated on a 5-point scale (0 = never to 4 = always). The total scores range from 0 to 100 with 0 indicating the best health status. Abdominal pain was assessed using the 'pain' domain of the EHP-30. This consists of 11 items that assess pain intensity and its impact on social life, daily activities, sleep, movement, and eating. Furthermore, abdominal pain was assessed with the following question that was asked after the diet: 'Did the diet improve your pain symptoms? If yes, which symptoms?'.

After the diet, patients were contacted by the researcher to answer additional questions about the diet. These included the previous questions about bowel- and pain symptoms, whether patients would recommend the diet to other endometriosis patients, and the extent to which they adhered to the diet. Adherence to the diet was measured by asking the question: 'What percentage did you deviate from the diet?' The percentage calculated from this was used as a measure of non-adherence, indicating the extent to which participants did not strictly follow the prescribed diet. Deviating from the diet was defined as not adhering to the diet, such as consuming FODMAPs that should be avoided. Participants were also asked which FODMAPs they had reacted to. A reaction

was defined as an increase in symptoms after reintroducing a particular FODMAP. Electronic questionnaires were sent by ResearchManager Electronic Data Capture software at baseline, after the elimination period, and after completing the diet. All data were derived from participants' self-reported responses to the questionnaires.

Sample size

It was not possible to perform a proper sample size calculation because of the absence of data on variability of the outcomes. For this prospective pilot study we had chosen to include 30 patients in order to calculate a standard deviation to be used in future studies and to be able to make an estimate of the clinical relevance of the outcomes. During the study, we decided to include an additional 17 patients due to an unexpectedly high dropout rate. In order to make more reliable conclusions on the effect of the fully completed diet, we decided to increase the sample size.

Statistical analysis

The Statistical Package for the Social Sciences (SPSS) version 22 was used to perform statistical analyses [18]. Descriptive statistics were expressed as numbers with percentages for categorical data, medians with interquartile ranges (IQR) for non-normal distributed continuous variables, and means with standard deviations (SD) for normal distributed continuous variables.

Mean individual changes of primary and secondary outcomes after the diet compared to baseline were evaluated using a paired T-test or Wilcoxon signed rank test. We also performed an analysis on patients with available data and who were loss to follow-up or who did not complete the diet for other reasons. Missing data were handled using the listwise deletion method, where only participants with complete data for both baseline and follow-up measurements were included in the analysis. $P < 0.05$ was considered significant.

Results

From June 2020 to July 2023, 47 patients were eligible and gave consent to participate in the study. Thirteen participants withdrew before the start of the low-FODMAP diet due to various reasons, shown in Fig. 1. One of the reasons was that surgical interventions occurred during the research period. Another reason was that some patients eventually lacked the motivation or time to follow a strict diet. Out of the remaining 34 participants, 24 (71%) completed the diet. Ten participants discontinued the diet at various time points: seven after completing the elimination phase, one during the elimination phase after two weeks, and two during the reintroduction

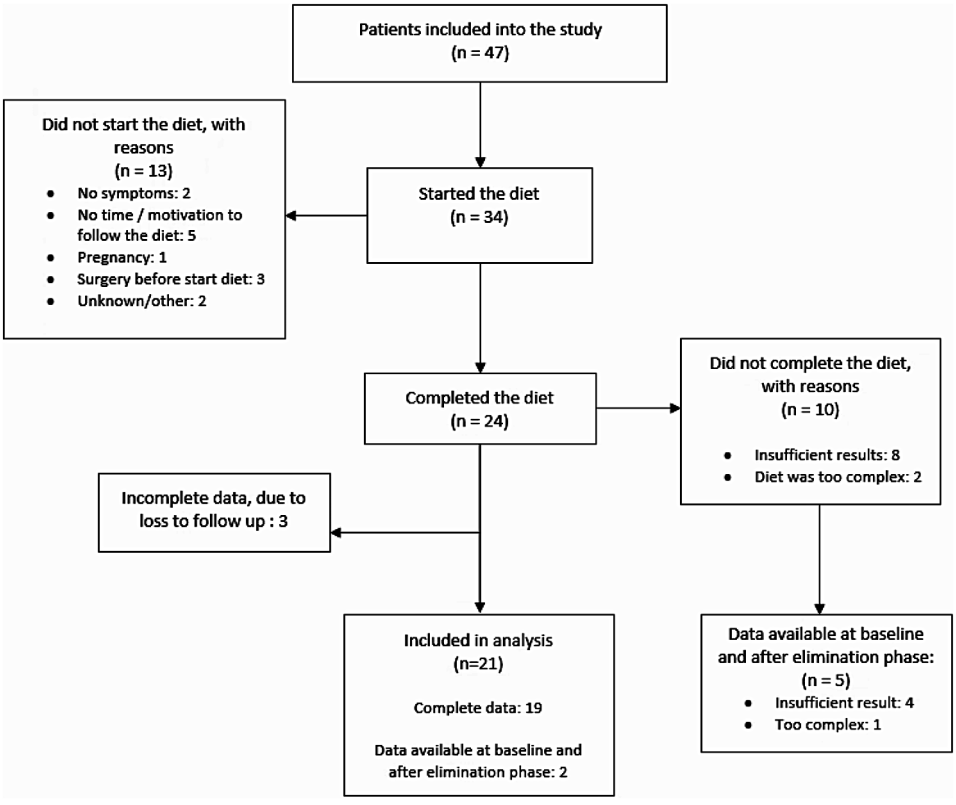

Fig. 1 Flow diagram

phase, although the exact time point is unknown. We distinguished between participants who completed the diet and those who discontinued it. (Fig. 1) Five participants with baseline and post-elimination period data who did not complete the diet were excluded, while two participants who completed the diet but did not submit their final questionnaire were included in the analysis.

Baseline characteristics of the participants who completed the diet and who dropped out are shown in Table 1. There were no statistically significant differences between these two groups.

The participants who completed the diet reported significantly less constipation after the diet compared to their baseline scores with a mean difference of 2.1 (95% CI: 0.4–3.7, $p = 0.023$). There was no significant difference in experiencing bloating. A small decrease of experiencing bloating appeared after the elimination phase, however this was not significant ($p = 0.125$). Better scores of all core domains of the EHP-30 questionnaire and 'work life' and 'sexual intercourse' were reported after the diet compared to their baseline scores. The mean differences were 18.6 (95% CI: 7.6–29.6, $p = 0.002$) for 'pain', 32.7 (95% CI: 21.9–43.5, $p = 0.000$) for 'control and powerlessness', 16.1 (95% CI: 7.8–24.3, $p = 0.001$) for 'emotional well-being', 15.2 (95% CI: 3.0–27.3, $p = 0.017$) for 'social support', 10.7 (95% CI: 0.8–20.6, $p = 0.035$) for 'self-image', 22.0 (95% CI: 9.6–34.3, $p = 0.003$) for work life and 17.7 (95% CI: 2.9–32.5, $p = 0.023$) for sexual intercourse. (Table 2) Within the group of participants who did not complete the diet, there were no significant differences for constipation, experiencing bloated feeling and most QoL domains between follow-up after the elimination phase and baseline. There was only a significant worsening of the QoL domain 'control and powerlessness' (Wilcoxon signed rank test statistic: -6.7 (95% CI: -11.3– -2.0, p =.046). (Additional Table 1) We could not perform a trustworthy comparison between groups who did and did not complete the diet due to small numbers.

Of the participants who started the diet, 63% agreed or completely agreed that the diet was easy to maintain. The most common FODMAPS the participants had to eliminate were fructo-oligosaccharides and lactose. The participants who completed the diet reported an average of 8% non-adherence. 84% of them experienced a decrease in bowel symptoms and 53% experienced less bloating. Additionally, 65% of them experienced less pain, especially chronic pelvic pain. 50% continued the diet after completing the study, meaning they kept removing the FODMAPs they reacted to from their diet. Finally, the majority of all participants found the low-FODMAP diet a good addition to current therapies for endometriosis (87%) and would recommend the diet to other patients with endometriosis and bowel symptoms (90%). (Additional Table 2)

Table 1 Patient characteristics

	Sample who completed the diet ($n = 24$)	Sample who did start, but did not complete the diet ($n = 10$)	*p*-value
Age in years, M ± SD	32.5 ± 7.9	32.0 ± 7.4	0.866
Education, N (%)	0	0	0.697
Primary Education	2 (8.3)	0	
Secondary Education	10 (41.7)	6 (60)	
Tertiary Education	9 (37.5)	3 (30)	
Bachelor's Degree	3 (12.5)	1 (10)	
Masters/ Doctoral Degree			
BMI kg/m2, M ± SD	24.3 ± 4.7	26.6 ± 4.3	0.226
Lifestyle, N (%)	1 (5.6)	1 (12.5)	0.529
Current smoker	10 (55.6)	7 (77.8)	0.244
Current use of any alcohol			
Endometriosis, N (%)	11 (45.8)	3 (30)	0.498
Superficial	6 (25)	1 (10)	0.315
Endometrioma	11 (45.8)	6 (60)	0.452
DIE	2 (8.3)	0	0.338
Endometrioma + DIE			
Medical history, N (%)	3 (12.5)	1 (10)	0.682
Uterus extirpation	4 (16.7)	0	0.229
Bowel or anus surgery			
(Anamnestically) diagnosed with IBS, N (%)	9 (37.5)	4 (40)	0.594
ROME III at baseline, N (%)	14 (58.3)	5 (50)	0.471
IBS	4 (16.7)	4 (40)	0.154
Functional constipation			
Current treatment, N (%)	3 (12.5)	0	0.338
	3 (12.5)	0	0.338
Combined oral contraceptives	0	0	0.706
	1 (4.2)	0	0.080
Progesteron only pill	0	2 (20)	0.228
Levonorgestrel IUD	3 (12.5)	3 (30)	0.656
NuvaRing	14 (58.3)	50 (50)	
GnRH agonist			
Pain medication			
No medication			

M: mean, SD: standard deviation, DIE: deep infiltrating endometriosis, IBS: Irritable bowel syndrome, IUD: intrauterine device, GnRH agonist: gonadotropin-releasing hormone agonist

Discussion

This study aimed to evaluate the effect of the low-FODMAP diet on bowel symptoms such as constipation and bloating, QoL and abdominal pain in patients suffering from endometriosis. Our results demonstrate significant improvements in constipation scores and multiple aspects of QoL, including 'pain', among participants who completed the diet. Additionally, 65% of the participants experienced less pain, especially chronic pelvic pain after the diet. While the prevalence of bloating was not different after the diet compared to baseline, 53% of the

Table 2 Influence of low FODMAP diet on constipation, bloated feeling and quality of life

	Baseline ***n*** **= 24**	**After elimination phase** ***n*** **= 19**	**After reintroduction phase** ***n*** **= 21**	***P*-value: baseline vs. after reintroduction phase**
Constipation (0–30)[§] Median (IQR)	7.0 (5)	6.0 (5)	5.0 (4)	***0,023***[1]
Bloated feeling, N (%)	24 (100)	15 (78.9)	21 (100)	0
EHP-30 pain (0-100)[±] M ± SD	47.8 ± 20.1	35.8 ± 19.1	29.2 ± 17.3	**0.002**
EHP-30 control & powerlessness (0-100)[±] M ± SD	69.4 ± 14.1	52.4 ± 25.8	36.7 ± 27.1	**0.000**
EHP-30 emotional well-being (0-100)[±] M ± SD	45.2 ± 21.1	33.1 ± 24.2	29.2 ± 23.2	**0.001**
EHP-30 social support (0-100)[±] M ± SD	46.4 ± 27.9	37.2 ± 18.7	31.3 ± 24.3	**0.017**
EHP-30 self-image (0-100)[±] M ± SD	51.2 ± 28.5	45.6 ± 27.7	40.5 ± 29.0	**0.035**
EHP-30 work life (0-100)[±] M ± SD	35.0 ± 27.4 (*n* = 22)	26.2 ± 25.5 (*n* = 17)	21.7 ± 23.2 (*n* = 15)	**0.003** (*n* = 15)[2]
EHP-30 children (0-100)[±] Median (IQR)	25.0 (25.0) (*n* = 7)	27.1 (40.6) (*n* = 6)	25.0 (43.8) (*n* = 5)	0.317[1] (*n* = 5)[2]
EHP-30 sexual intercourse (0-100)[±] M ± SD	61.6 ± 23.7 (*n* = 19)	54.0 ± 31.0 (*n* = 15)	45.7 ± 33.3 (*n* = 14)	**0.023** (*n* = 13)[2]
EHP-30 medical profession (0-100)[±] Median (IQR)	18.8 (64.1)	12.5 (43.8)	0.0 (28.1)	0.132[1]
EHP-30 treatment (0-100)[±] M ± SD	36.7 ± 28.7 (*n* = 20)	41.7 ± 27.7 (*n* = 14)	30.1 ± 32.4 (*n* = 13)	0.389 (*n* = 12)[2]
EHP-30 infertility (0-100)[±] Median (IQR)	65.6 (40.6) (*n* = 10)	62.5 (43.8) (*n* = 7)	37.5 (75.0) (*n* = 11)	0.715[1] (*n* = 7)[2]

EHP-30: Endometriosis Health Profile 30, M: mean, IQR: interquartile range

§ 0 indicating normal, ± 0 indicating best health status

1: Calculated using Wilcoxon Signed Ranks Test

2: Number of participants having data available both at baseline and after reintroduction phase

patients that completed the diet answered that they did experience less bloating.

Patients who did not complete the diet showed a significant worsening in the 'control and powerlessness' domain. When patients completed the diet, in this specific domain of QoL the largest improvement was observed. This result suggests that following the diet empowers patients to take an active role in managing their symptoms. This aligns with previous studies that suggested that self-management strategies have a positive effect on QoL by helping patients to have control over their disease [19].

Our findings are consistent with previous research that has demonstrated the effectiveness of a low-FODMAP diet in alleviating bowel symptoms among patients with endometriosis [13, 14, 20, 21]. A study on the low-FODMAP diet for patients with endometriosis and/or IBS found significant improvement in bowel symptoms for patients with both IBS and endometriosis, with 72% showing more than 50% bowel symptom reduction compared to 49% in those with IBS alone [13]. Additionally, a recent prospective study showed that compared to their baseline pain scores, participants adhering to a diet (low-FODMAP or endometriosis diet) reported significantly less non-cyclical deep dyspareunia, cyclical dysuria, bloating, and tiredness in endometriosis patients after six months [14]. Almost half (44%) of 484 respondents with endometriosis in an Australian cross-sectional study on self-management options reported making dietary modifications, such as eliminating gluten, dairy, and/or FODMAPs. They noted significant improvements in pelvic pain, gastrointestinal symptoms, and fatigue [20]. Aside from anecdotal reports in our study, we were unable to demonstrate a significant effect on bloating, which contrasts with earlier results [14]. Previous research has shown that patients with endometriosis following the low-FODMAP diet reported improvements in three out of eleven QoL domains after 6 months compared to their baseline [14]. Our study demonstrated improvements in QoL in seven out of eleven domains. All contributing to further evidence to support the therapeutic benefits of the low-FODMAP diet.

It should be kept in mind that in this study a large proportion (28%) of patients who were supposed to start the diet eventually did not start due to various reasons, including the lack of motivation and time. Also, 8 out of 34 patients stopped the diet because it appeared to be ineffective for them. The dropout is a good reflection of daily care, though, as it proves to be difficult to get (and keep) patients fully motivated to follow a strict diet. The adherence to the diet is important to maximize the effect of the diet [14]. In our study, adherence was high, with an average non-adherence rate of 8% among those who completed the diet. Although some patients have not completed the diet, they would still recommend it for patients with endometriosis and bowel symptoms because according to them it is accessible and has no harmful effects. To enhance motivation, combining diet therapy with psycho-education might be beneficial. This approach is currently being studied in a randomized controlled trial in Nijmegen, the Netherlands. (Clinicaltrials.gov: NCT06332560) [22].

An important motivation for conducting this study was that patients with endometriosis were engaging in self-management treatments despite the lack of evidence. Before offering and advising this diet to patients in clinical practice, we wanted to investigate effectiveness. When we began our research, this was the first registered prospective study examining the effects of the low FODMAP diet on patients with endometriosis. Recently another study has been published, and our work now adds valuable evidence to this field. Although the studies show similarities, our study demonstrates a large dropout. An important aspect of our study was the referral to dietitians who were not part of the research team. While this approach could have led to a larger dropout, it mirrors real-world scenarios more accurately, as it reflects common practices where external dietitians are often involved. Consequently, the outcomes of our study might be more representative of the results that could be expected following implementation.

Despite the promising results obtained from our study, several limitations should be acknowledged. Our final sample size was small, especially after eliminating patients who did not complete the diet. However, demonstrating a large proportion of participants who did not start or continue the diet importantly reflects a significant outcome and is likely representative of daily care of patients with endometriosis. Nonetheless, the limited number of participants makes it challenging to explore factors and/or confounders, like concurrent use of hormonal medication, type of endometriosis and severity of pain, which may have influenced diet completion and effectiveness. The absence of a control group in our study complicates the ability to rule out potential placebo effects. Another limitation is the potential influence of maturation effects, as natural changes over time, regardless of the intervention, could have contributed to the observed outcomes. We did not measure pain using a standardized score such as the numeric rating scale or the visual analogue scale. Instead, we asked a question about overall pain as recommended by Core Outcome Measures in Effectiveness Trials (COMET initiative), but which is still a work in progress [23]. When patients reported improvement in pain, we attempted to specify it further. Additionally, we assessed pain as an aspect of QoL, however this measures pain interference rather than pain intensity. Finally, this pilot study had a follow-up duration similar to the diet duration itself. It would be interesting to investigate the effects over an extended period in the participants that continued the diet after the study period.

These limitations underscore the need for future research to address these shortcomings. A larger-scale study with a control group is necessary to confirm the efficacy of the low-FODMAP diet in endometriosis patients. Additionally, a longer follow up period would provide valuable insights. Also, exploring the potential synergistic effects of combining the low-FODMAP diet with other treatment modalities could lead to more comprehensive management strategies for endometriosis.

In conclusion, although the potential benefits and harms are still unclear, non-medical management strategies are widely used by patients with endometriosis [24]. This study provides preliminary evidence for the potential benefits of the low-FODMAP diet in managing constipation, pain and improving QoL in patients with endometriosis and who are motivated to adhere to a diet. Our findings highlight the importance of considering dietary interventions as part of a holistic approach to endometriosis management. For an evidence-based recommendation adequately designed trials are needed.

Abbreviations

FODMAP	Fermentable Oligo-, di-, mono-saccharides, and polyols
IBS	Irritable Bowel Syndrome
EHP-30	Endometriosis Health Profile-30
QoL	Quality of Life

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12905-025-03715-1.

Supplementary Material 1

Supplementary Material 2

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Author contributions
AK, VV, MvdK, MB, SC and JM conceptualized the specific research questions and analytic approach for this manuscript. Analyses were conducted by AK. Recruitment of participants was done by AK, VV, MvdK, SC, MB and JM. AK wrote the first draft of the manuscript, and all authors edited and revised the manuscript. All authors read and approved the final manuscript.

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Data availability
Data is provided within the manuscript or supplementary information files.

Declarations

Ethics approval and consent to participate
The study was registered prospectively on September 13th 2019 in the Dutch Trial Register (NL8022) (https://onderzoekmetmensen.nl/en/trial/52456) and was conducted according to the principles of the Declaration of Helsinki and approved by the National Central Committee on Research involving Human Subjects (NL71354.015.19) and the medical ethical research committee of the Máxima Medical Center (file number W19.080). Informed consent was obtained from all individuals included in this study. Date of first approval: 21th of January, 2020 and date of first participant enrollment: 27th of May, 2020.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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