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Evidence for the role of multidisciplinary team care in people with pelvic pain and endometriosis: a systematic review

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Authors' contributions

Authors 1, 4 and 5 conceived and developed the protocol. Author 1 performed the literature search, screen and synthesised the data. Authors 1, 2, 3, 4 and 5 interpreted results. Author 1 drafted the manuscript and Authors 1, 2, 3, 4 and 5 provided feedback, edited and approved the final version of the manuscript.

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Key Words: endometriosis, pelvic pain, multidisciplinary team care, holistic care

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Abstract

Background: Endometriosis is a chronic, inflammatory condition characterised by the presence of endometrial-like tissue outside the uterine cavity. Given the multi-system nature of the disease and the potential for significant negative impact on quality of life, there has been a long-standing recognition of the need for multidisciplinary care for people with endometriosis. However, there is paucity to the data supporting this approach, and much of the evidence is anecdotal.

Aim: This systematic review aims to describe recent evidence-based models and patient-centred perspectives of multidisciplinary care for endometriosis, to improve understanding of the role of an integrated, multidisciplinary team in effectively addressing patients' care needs.

Materials and Methods: PubMed, Medline, Embase and Web of Science were searched for relevant articles published between 1 January 2010 to 7 July 2022.

Results: Nineteen studies met the inclusion and exclusion criteria and pinpointed a multidisciplinary team consisting of gynaecologists, pain specialists, nurses, physiotherapists, psychologists, sex therapists, nutritionists, complementary medicine practitioners, and social workers to be most commonly utilised in holistically managing people with pelvic pain and endometriosis. Furthermore, patient perspectives on care highlighted the need for reliable information, respect and validation of experiences or preferences, discussion of long-term treatment plans and social and emotional supports.

Conclusion: The trend for multidisciplinary team care for people with endometriosis is growing. Further consumer-driven clinical studies and outcome evaluations need to be conducted to determine the effect of multidisciplinary care on improvements to quality of life for people living with endometriosis and or pelvic pain.

Introduction

Endometriosis is a chronic, inflammatory condition characterised by the presence of endometrial-like tissue outside the uterus. It is associated with various forms of pelvic pain (dysmenorrhea, dyspareunia, dyschezia and dysuria), debilitating comorbidities (such as fatigue, poor sleep, migraines, anxiety and poor mental health) and infertility, all of which substantially compromise quality of life[1]. The symptom experience for patients with endometriosis is unique for each individual, and therefore one single management approach is inappropriate. Both surgery (laparoscopy and excision of lesions) and medical management (analgesia and hormonal therapies) are used routinely[1], though results vary between patients.

Even after receiving treatment, many patients continue to experience chronic pelvic pain, for example, following surgery 25% of patients report having remaining pain symptoms[2]. Pain exacerbated by endometriosis leads to poor quality of life and higher anxiety and depression relative to those with asymptomatic endometriosis or healthy controls[3]. Using a biomedical, single-provider model to treat people with endometriosis is limited and antiquated; endometriosis is a complex and chronic condition requiring a multidimensional biopsychosocial model that enhances patient care[4, 5]. The limitations of the biomedical approach include a delay in diagnosis, shortcomings in management and lack of multidisciplinary or holistic treatment[6]. Multidisciplinary care can be defined as a team approach that utilises the skills of individuals from different disciplines, with each discipline approaching the patient from their own perspective, and normally involves separate individual consultations [7]. Often used as an interchangeable term, interdisciplinary care, is a method that integrates separate discipline approaches into a single consultation [7]. Regardless, patients report a lack of coordinated care between various providers[6], which may lead to confusion and frustration.

The biopsychosocial philosophy involves complex interactions between pain and biological, psychological and social factors, which may reciprocally influence each other [8]. Best practice for pain management recommends that "care should be based on the biopsychosocial model" [8]. In view of the clinical complexities involved in treating people with endometriosis and associated chronic pelvic pain, there is a need for an evidenced-based multidisciplinary care that leverages a patient-focused team of practitioners, with extensive knowledge of the management of symptoms associated with endometriosis, and a range of skills across multiple disciplines to improve outcomes for patients with an emphasis on an individualised or personalised approach [9]. The goals of multidisciplinary care for people with endometriosis and pelvic pain should be to provide long term, comprehensive and patient-centred care in a coordinated and systematic fashion that leads to more effective management of the various symptoms associated with the disease[6]. Worldwide to date, endometriosis centres of excellence that specialise in multidisciplinary care are few and far between, as there is no agreed-upon definition of such a centre[10]. Therefore, while it is increasingly accepted that multidisciplinary care is essential, research studies that assess the efficacy of the established multidisciplinary centres are limited[11-14].

This systematic review with narrative approach aims to summarise the literature evaluating the treatment models and philosophies of current multidisciplinary care, and subsequently report on the genuine needs of people with endometriosis and pelvic pain. By comparing and combining the services available to the unmet needs of patients, it is hoped that efforts are directed towards designing and implementing best patient-centred multidisciplinary care so that people with endometriosis receive consistent, evidence-based and cost-effective care to manage their disease more effectively.

Methods

This systematic review with narrative synthesis was performed according to the Preferred Reporting Items for Systematic Reviews (PRISMA) protocol (Prospero ID CRD42023409854). An electronic search of PubMed, Medline, Embase and Web of

Science was performed to identify all potential articles from 1st January 2010 to 7th July 2022 (see search strategy in **Supplementary Table 1**). Medical Subject Headings (MeSH) terms and keywords used to balance the sensitivity and specificity in the search included: *endometriosis* AND *multidisciplinary* OR *multidisciplinary team* OR *patient care* OR *interdisciplinary* AND *clinic** OR *centre** OR *center**. EndNote (Version X9) was used to store and record all stages of the review process. Duplicates were removed and the title and abstract of each paper was screened using the inclusion and exclusion criteria outlined in **Table 1**. The complete texts of the studies were then obtained and read in full. The research question, inclusion and exclusion criteria, and protocol were designed by Authors 1, 4 and 5. The literature search and screening process was conducted by Author 1. Any indecision was discussed and resolved by Authors 1 and 4.

Information from the studies that qualified for inclusion was extracted and summarised to describe the components included in multidisciplinary care models for those with endometriosis. Data points extracted included country of origin, study design, participant number, study objectives and main results and conclusions. Additionally, information was extracted that related to the perspectives of patients with endometriosis, or their carers, on multidisciplinary care. Extracted data regarding patient experience included listing the discipline, the number of studies that included the discipline, the number of studies that suggested or recommended the discipline and patient-reported need for the discipline. These were also subsequently grouped into common concepts that emerged from the relevant studies and considered in more detail in the results.

Results

The PRISMA flow chart of the search strategy and selection process employed for this narrative review is shown in **Figure 1.** A total of 1,625 records were extracted in the initial data retrieval process. During screening, 660 records were eliminated due to duplication, and 944 were removed following screening of the study title and abstract. Of the twenty-one full text articles reviewed, two were excluded for not meeting the inclusion criteria.

Nineteen studies were finally included in the study for review and data extraction. The main findings of these nineteen articles are summarised in **Table 2**. Briefly, many of the studies were undertaken in Australia (n = 6, with n = 1 jointly in Australia and Aotearoa New Zealand), followed by European (n=7) and North American countries (n = 4). Most studies were cross-sectional in design (n = 10), followed by prospective (n = 5), retrospective studies (n = 3) and 1 audit. Study size ranged between 21 and 938 participants.

Current structures of multidisciplinary team centres in endometriosis

Multidisciplinary care has been adopted by multiple centres around the world and retrospective and prospective studies have been conducted to assess the efficacy of the multidisciplinary approach in managing the healthcare needs and the array of symptoms that people with endometriosis experience. Members of the multidisciplinary care team explored in the final nineteen articles are presented in **Table 3**. Gynaecologists, physiotherapists and psychologists were reported most commonly in existing multidisciplinary care models (n = 4 each), with psychologist (n = 10) and pain specialists (n = 6) among the most frequently cited for suggested inclusion in future or improved multidisciplinary care design. With respect to the needs of patients, phycology (n = 4) was again highly ranked as a discipline for inclusion in multidisciplinary care along with complementary medicines (n = 4).

Most commonly, the multidisciplinary centres included in this review integrated gynaecologists that provided gynaecologic management (including minimally invasive surgery and hormonal therapy), pelvic floor physiotherapists to treat pelvic pain and restore pelvic muscle function, and psychologists that provided therapies including cognitive behaviour therapy and mindfulness-based therapy (**Table 3**). On top of the aforementioned specialists and programs, Yong et al. included an additional sexual education seminar in its multidisciplinary care [13, 14].

The multidisciplinary models of endometriosis care have been evaluated by clinical endpoints such as long-term pain and quality of life improvements, and the data indicate that the multidisciplinary approach may improve outcomes in people with endometriosis and pelvic pain. Allaire et al. reported an improvement in chronic pelvic pain severity, functional quality of life, health care utilisation and psychological comorbidities[11]. Wilkinson et al. reported a reduction in number of presentations, short stay admissions and daily opiate use in regular users[12]. In a similar vein, Yong et al. reported an improvement in the severity of dyspareunia[13] and sexual quality of life[14]. These findings are from non-randomised observational cohorts, and while promising, still require validation in more robust scientific investigations including long-term follow-up studies. Firm conclusions cannot be made about specific interventions and its efficacy, other than providing initial evidence for a positive impact of a multidisciplinary approach in managing people with endometriosis and associated symptoms including chronic pelvic pain.

Patient’s perspectives on multidisciplinary care

This systematic review has helped to identify important aspects of patient-centred care that may increase treatment satisfaction, and have been identified by patients themselves. In addition to the individual specialities outlined in **Table 3**, the following commonly identified concepts were reported; receiving reliable information about endometriosis and available treatments, healthcare professionals validating an individual’s experiences and preferences, having a long-term plan for treatment, and having social and emotional support from partners and family members[15-19]. These patient-centred care aspects are explored in more detail in the following sections.

- Addressing poor mental health in people with endometriosis and pelvic pain

The psychological profiles of people with endometriosis and pelvic pain presenting to a multidisciplinary clinic have been highlighted in seven studies[20-26]. Bryant et al. reported higher levels of anxiety symptoms compared to depressive symptoms in patients with chronic pelvic pain, which was strongly correlated with pain catastrophising and weaker self-efficacy[20]. Similarly, Facchin et al. and Joseph et al. concluded that pain was associated with poorer psychological outcomes in people with endometriosis, and thus higher levels of catastrophic thinking, negatively impacting on quality of life and outcomes[22, 23].

Many patients reported pain catastrophising and weak self-efficacy in association with endometriosis pain symptoms[20]. Self-efficacy is a core determinant of health behaviour, with higher self-efficacy associated with better control and management of pain, resulting in improved quality of life[25]. Therefore, pain management programs, offered through pain specialist, physiotherapist and psychologist, targeting education and subsequent behaviour changes may be more effective. This includes evaluating illness perceptions and where appropriate, challenging unhelpful or inaccurate perceptions and actively linking this to behaviour change[20]. On the contrary, one study concluded that pain improvement was not associated with a marked change in mood[21]. Cagnacci et al., suggested that this could be explained by pain improvement requiring more time to modify mood due to slow changes in neuronal plasticity after experiencing prolonged pain. However, overall, early intervention with a multidisciplinary approach may improve mood in patients with symptomatic endometriosis in the long term.

Patient's sexual satisfaction also has an impact on their psychological morbidity. Netzl et al. reported on sexual dysfunction as a major contributor to mental health decompensation[24]. The inability to have penetrative intercourse, directly impacts on a patient's psychological wellbeing, exacerbating anxious and depressive symptoms[26]. A multidisciplinary approach to this is establishing a program targeting dyspareunia and vulvodynia, encompassing multiple aspects of the condition including psychological, muscle based, and medical, with the support of gynaecologists, clinical psychologists, pelvic floor physiotherapists and sex therapists[27].

- Increasing education and information

Having available, contemporary and quality assured information for both patients and their relatives or carers was identified as an important aspect in multidisciplinary care for people with endometriosis and pelvic pain[28]. A study conducted by Rowe et al. reported patients' frustrations with receiving differing opinions and information, leading to help-seeking behaviours from a variety of other sources[15]. Marki et al. also reported patients with feelings of doubt and uncertainty due to accessing contradictory information[16]. This current inability to obtain sufficient and non-contradictory information will lead to negative healthcare experiences, contribute to a delay in diagnosis, and negatively affect the relationship between healthcare professionals and patients[17]. The consensus reached by Rowe et al. and Marki et al. reported the need for accurate and consistent information to be distributed to patients by healthcare professionals[15, 16]. Similarly, a cross-sectional study by Apers et al. identified the importance of reliable information provision to patients' wellbeing[18]. This is explained by patients perceiving information as a central and enabling factor to take an active role in their endometriosis care, allowing for shared-decision making and true patient-centred care, thus reducing pain catastrophising[28].

The mode of delivering information is of equal importance. A prospective survey conducted by Omtvedt et al. concluded that oral communication was the most favoured method of receiving information, followed by written communication. Other forms included a combination of both oral and written communication, the use of websites, and information videos[28]. This highlighted the different channels of communication available for healthcare professionals to personalise their provision of information to patients' needs and wants. Since there is consistent evidence in the literature regarding the association between receiving accurate information and patient satisfaction, there is a need to establish information provision as a core aspect to a multidisciplinary care model.

- Being listened to with empathy and respect

Showing respect for patients' values, preferences and needs should be central and prioritised in the multidisciplinary care of patients with endometriosis and pelvic pain[28]. However, a recent report highlights the negative patient-provider partnerships rife with invalidating and dismissive behaviours by healthcare providers[4]. In another recent study, patients reported their pain being dismissed by medical professionals as "normal"[15]. This is consistent with Evans et al. study, which reported medical professionals gaslighting patients, downplaying their experiences, causing adversarial patient-provider relationships[4]. This is especially prevalent among patients who used complementary and alternative medicine (including diet, supplements, herbal remedies, heat packs and acupuncture)[15]. A cross-sectional survey by Arentz et al. reported derogatory reference to female users of acupuncture as "desperate"[19]. This not only diminishes patients using complementary and alternative medicine, it further describes the alienation and dissatisfaction patients feel towards their endometriosis care, contributing to mental ill-health and greater comorbidities. Patients reported improved self-efficacy after utilising complementary and alternative treatments because of the holistic care that cultivates their confidence and resilience. This ultimately relieves their social isolation and thus improving quality of life[4, 15, 16, 19].

- Long term treatment plans

Long term treatment plans are important for continuity of care. In studies conducted by Omtvedt et al., Rowe et al. and Evans et al., patients highlighted a lack of information about long term management of endometriosis-related symptoms and a lack of follow-up provided by healthcare professionals[15, 18, 28]. Thus, efforts must be made to utilise a dynamic treatment regime to manage the ever-changing priorities of people with endometriosis and pelvic pain over their life course.

- Social and emotional supports

Omtvedt et al., concluded that support groups and involvement of patients' relatives and/or partners in care plans is important to patients[28]. Similarly, Marki et al. and Evans et al. both reported on the importance of social support from endometriosis community members and support from their partners and relatives in coping with endometriosis[4, 16]. The expertise and understanding found within supportive social groups, family members and partners can provide the foundation for patients to develop resilience that equips them to manage the burden of living with endometriosis. Therefore, a multidisciplinary approach that encompasses the involvement of partners, family and friends in consultations, and the facilitation of support groups in parallel with multidisciplinary clinics[16, 28], can not only increase awareness and educate patient's support network, but also enhances patient's sense of empowerment.

Discussion

The complexity of the heterogeneous symptoms experienced by people with endometriosis demands healthcare services provide high quality multidisciplinary care across specialities with an emphasis on the biopsychosocial philosophy. This ensures that a full and diverse range of therapeutic options are considered early to allow appropriate and timely treatments for patients. Yet, there is no validated framework for multidisciplinary team care in this setting. Our study serves to review the current multidisciplinary centres and the perceived efficacy of these models; and to explore important aspects of patient-centred care identified by people with symptomatic endometriosis, to implement best practice in endometriosis care.

Many common themes emerged with respect to reports of existing multidisciplinary frameworks, including utilisation of gynaecologists, physiotherapists and psychologists. Furthermore, the recommendation for inclusion of psychologists and pain specialists in future centres. Unfortunately, it was evident that there was a disconnect between what is currently provided in the multidisciplinary approach for treatment of endometriosis and pelvic pain, and what patients deemed important for their short- and long-term care. Interestingly, our review found that a nurse was not considered integral to the endometriosis multidisciplinary team by providers or patients. This is in contrast to studies from the UK where clinical nurse specialists lead multidisciplinary clinics for people with endometriosis or endometriosis-related symptoms [29, 30]. However, these nurse-led clinics have yet to be evaluated and there is significant variation in how they are run [29].

It is important to acknowledge that a multidisciplinary team may not always be needed to provide adequate management of endometriosis and its associated symptoms. Instead, good therapeutic alliance between a patient and a single provider may be sufficient to make a meaningful difference to meeting the needs of an individual with endometriosis[31]. Furthermore, we also recognise that not all people with endometriosis will require a holistic approach to care and symptom management, for example, 2-11% of those with endometriosis will be asymptomatic[1], and current treatment modalities will result in adequate symptom management in some individuals with endometriosis. For example, a recent meta-analysis found that surgery combined with drug therapy resulted in lower rates of disease recurrence (OR = 0.19, 95% CI [0.11, 0.33]) compared to surgery alone[32].

Increased efforts should be focused towards understanding nociplastic pain plays a role in the development and maintenance of chronic pelvic pain in people with and without evidence of endometriosis[11]. This is important as nociplastic pain could explain the presence of chronic pain in the absence of any peripheral pathology (e.g. endometriosis), and the discrepancy between the magnitude of tissue involvement and magnitude of pain and disability experienced by people with endometriosis and chronic pelvic pain[14]. Nociplastic pain is also associated with symptoms like fatigue, poor sleep, migraine, fibromyalgia, anxiety and low mood[4, 20]. As patients with chronic pain naturally tend to worry, it is recognised that pain neuroscience education can be provided to help reduce the intensity and catastrophising of pain[33]. Therefore, we encourage the need for a multidisciplinary care team with a multifactorial framework targeting both peripheral and central factors of chronic pelvic pain and education [34].

Consumers have not previously been involved in the design of the multidisciplinary clinics. Furthermore, we demonstrated that there were differences between the services offered by a multidisciplinary care team versus those perceived as being important to patients themselves (**Table 3**). For example, several studies reported that patients viewed complementary and/or alternative medicine as an important tool in managing their endometriosis symptoms, however, none of the centres included in this review listed complementary or alternative medicinal practices as part of their program of care. Research is emerging that examines the efficacy of complementary and alternative treatment (acupuncture) for pelvic pain[35]. We know that patient-centred care is proven to improve health outcomes[36]; harnessing this association and including patients' recommendations during the establishment and implementation of multidisciplinary care clinics for endometriosis is the epitome of patient-centredness. However, we acknowledge that there is an unmet need for research into these multidisciplinary care models, and evidence should be collected and evaluated to promote best evidence practices. Therefore, future studies, which invite and integrate patient's perspectives in the designing of endometriosis centres of excellence should be undertaken and subsequently evaluated. Such research would have the potential to determine more conclusively the impact of multidisciplinary care components on quality of life of people with endometriosis.

The role of surgery within a multidisciplinary care model was not reported by these studies. The most recent Cochrane review examining the evidence for the surgical management of endometriosis concludes that it remains uncertain as to whether laparoscopic surgery reduces overall pain associated with endometriosis [37]. The accepted biomedical model of endometriosis-associated pelvic pain supports surgical management, and this is reflected in funding standards for surgical treatment. Future research should guide funding bodies and policy makers with regards to the role of other treatments within the biopsychosocial paradigm in which patients with endometriosis should be managed.

Our review is not without limitations. Several critical methodological issues should be considered in interpreting the results of this study. First, we recognise that some studies focused on pelvic pain as the primary health concern, and while endometriosis was mentioned in these papers, it was not the main focus of the work[11-14, 19-21, 23]. As chronic pelvic pain can occur in the absence of endometriosis (or continue following successful treatment of endometriosis), our study set may be diluted by non-endometriosis specific findings. Many studies included patients with chronic pelvic pain, which is multifactorial in nature and does not arise due to a single pathophysiological process. In addition to endometriosis, other aetiologies such as adenomyosis, vulvodynia, urinary tract and gastrointestinal pathologies, musculoskeletal conditions, and injuries related to childbirth are involved. However, given the mechanisms by which endometriosis causes pain are similar to those that cause chronic pelvic pain, it is likely that these results remain valid for the subgroup with endometriosis[38]. Moreover, it is not always ethical to make a surgical diagnosis of endometriosis, and rather a symptom-based approach (rather than disease-specific) is desired. Secondly, the non-randomised observational study design of all the included studies does not allow drawing conclusions in terms of causality. Therefore, firm conclusions cannot be drawn about whether a multidisciplinary team and their interventions lead to positive patient outcomes. Thirdly, all cited studies relied on samples from a tertiary care setting. This limited patient diversity means we cannot, therefore, extrapolate these findings to patients in community-based, non-clinical samples. Therefore, overall the subtleties of endometriosis and the symptoms related to endometriosis may not be accommodated for, and it is acknowledged that this may not be possible. Lastly, while the design of this review was developed by multiple authors, the literature search and screening were undertaken by a single author, therefore we cannot rule out subsequent risk of bias.

Conclusions

The current emergence of multidisciplinary endometriosis centres is seen as favourable in managing the heterogenous symptoms of people with endometriosis. In an attempt to gather evidence to support this notion, we can speculate based on our review that a multidisciplinary centre consisting of gynaecologist, pain specialist, nurses, physiotherapist, psychologist, sex therapist, nutritionist, complementary and alternative medicine, and social worker, may provide the best holistic care to patients with endometriosis and pelvic pain. Notwithstanding, inclusion of general practitioners, gastroenterologists (and diagnostic colonoscopy) and specialised imaging providers would further aid in reducing the gap between primary and secondary care and improve differentiation of common comorbidities. Importantly, incorporation of patient-centred care should be weighted in planning and development of multidisciplinary centres. Until all of these frameworks are considered, evaluated and validated, best-practice in multidisciplinary care for people with endometriosis and pelvic pain leading to improved patient satisfaction and quality of life remains to be resolved.

Declaration of interest

No potential conflict of interest was reported by the authors.

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Figure Legends

Figure 1. PRISMA diagram of the study selection.

The PRISMA diagram outlines the search and selection process applied during the literature search and critical review. This step-wise process resulted in nineteen papers that were included in the final review.

Figures

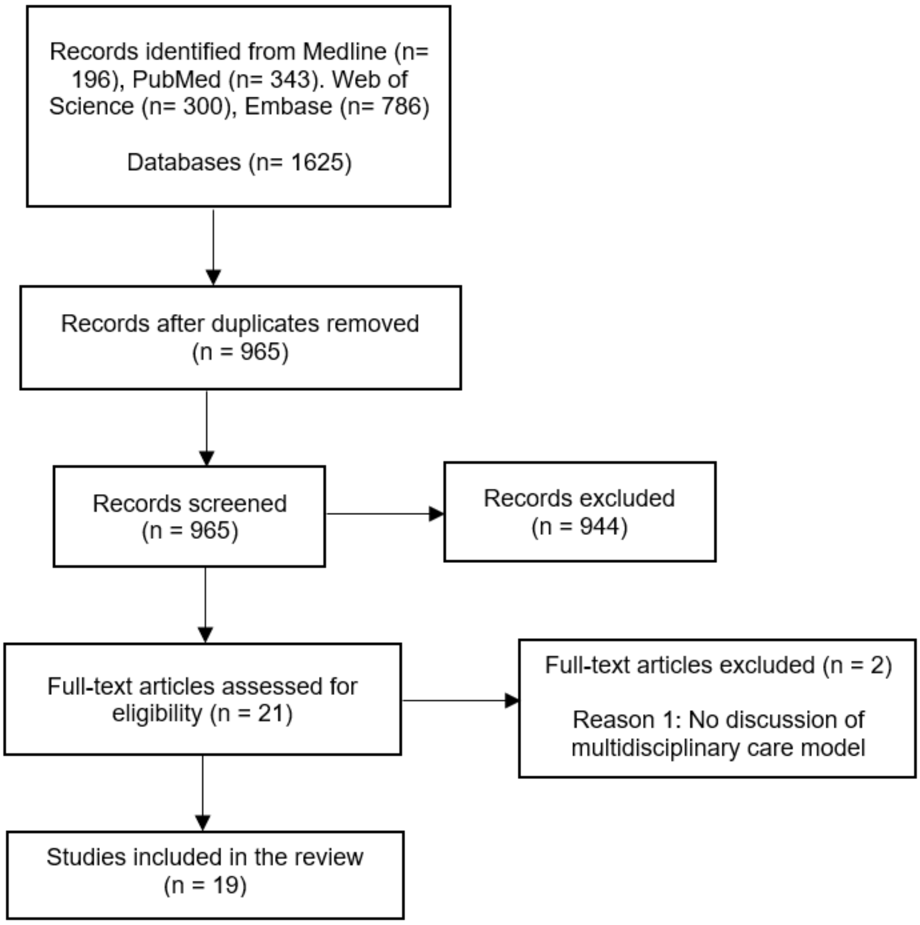

Figure 1. PRISMA diagram of the study selection

Tables

Table 1. Inclusion and exclusion criteria for studies

Inclusion criteria	Exclusion criteria
- Published in English - Published from 1 January 2010 to 7 July 2022 - Full-text, original articles - Randomised controlled trials, non-randomised observational studies (cohort, case-control and cross-sectional studies) and audits assessing the role and benefits of multidisciplinary team approach to endometriosis management	- Review articles, case reports, PowerPoint presentations, abstract-only studies - Studies assessing endometriosis management without reporting a multidisciplinary approach

Table 2. Summary of articles included in this review

Study	Country of origin	Study design	Study population (N)	Study objective(s)	Results and Study Conclusion(s)
Agarwal et al., 2021	USA	Retrospective	638	To characterise demographics, clinical characteristics, and pain severity for patients entering the multidisciplinary endometriosis treatment program.	52% of patients with dysmenorrhoea reported severe pain, 42% of patients with non-menstrual pelvic pain reported moderate pain, 30% of patients with non-menstrual pelvic pain reported severe pain. Indicated that the multidisciplinary approach requires evaluation for improvement to clinical outcomes.
Allaire et al., 2018	Canada	Prospective	525 (296 completed 1 year follow up, 229 lost to follow up)	To describe trends and factors associated with chronic pelvic pain over a 1 year prospective cohort period at an interdisciplinary centre for pelvic pain and endometriosis.	Chronic pelvic pain severity decreased by a median 2 points from baseline to 1 year (6/10 to 4/10, P <0.001). Improvement in functional quality of life (42 to 29% on the pain scale, P <0.001). Reduced physician visits (73 to 36%, P <0.001), or emergency visits (24 to 11%, P <0.001) in the last 3 months.
Apers et al., 2018	Netherland	Cross-sectional	109	Whether multidisciplinary patient-centred endometriosis care (PCEC) is associated with health-related quality of life (HRQOL).	A significant association was found between overall PCEC and the HRQOL-subscale 'social support' (P = 0.026).

					The PCEC-subscales ‘information and continuity’ were significantly associated with the HRQOL-subscales ‘emotional wellbeing’ and ‘social support’ (P <0.05). The PCEC-subscales ‘respect’ was significantly associated with HRQOL-subscale ‘emotional wellbeing’ (P = 0.023).
Arentz et al., 2021	Australia and New Zealand	Cross-sectional	122	To explore Traditional Chinese Medicine practitioners’ understanding and treatment of patients with a history of endometriosis experiencing chronic pelvic pain, and how practitioners integrate their management and care into the multidisciplinary health care system.	91.7% practitioners reported regular treatment of patients with chronic pelvic pain. Once per week was the most common treatment frequency (66.7%) for acupuncture. Meditation (63.7%) and dietary changes (57.8%) were other commonly used approaches. 71.2% of practitioners reported they perceived their treatment was effective in managing pain, following up to 12 treatments.
Bryant et al., 2016	Australia	Cross-sectional	175	To describe the psychological profile of patients, some of whom have a history of endometriosis, presenting with chronic pelvic pain at a tertiary referral centre consisting of a multidisciplinary team approach.	53% experienced either moderate or severe anxiety. 26.7% experienced moderate to severe depression.
Cagnacci et al., 2019	Italy	Prospective	117	To evaluate how pain modification influences mood and quality of life of patients with chronic pelvic pain to inform a multidisciplinary care approach. Patients were	Pain during menses (P <0.001), between menses (P <0.002) and at intercourse (P <0.02) decreased. Quality of life survey data (SF-36) increased (P <0.03), State-Trait Anxiety Inventory data slightly

				recruited at the outpatient service for endometriosis and chronic pelvic pain at a University Hospital.	decreased (P <0.02), while depression did not change (P = 0.36).
Evans et al., 2021	Australia	Cross-sectional	532	To document the frequency of conventional and complementary treatments used by Australian patients with endometriosis and the perceived efficacy of these treatments; and to qualitatively explore patient's treatment satisfaction.	Medication for pain relief was rated as significantly more effective than complementary/self-care strategies (P <0.001). Qualitative data identified that 36% of patients were dissatisfied with treatment, 34% were somewhat satisfied, and 24% were satisfied. Qualitative themes explored include: 1) barrier to treatment; 2) need for holistic, interdisciplinary care; 3) patient knowledge, advocacy and resilience in endometriosis management.
Facchin et al., 2017	Italy	Cross-sectional	210	To evaluate what factors affect the mental health of patients with endometriosis to target multidisciplinary interventions.	Being in a stable relationship was associated with decreased rumination (P = 0.002). A shorter time from diagnosis was associated with greater anxiety (P = 0.015). Pelvic pain severity and 'self' were associated with all mental health variables (Ps < 0.01). Greater self-esteem, body-esteem, and emotional self-efficacy were correlated with better psychological outcomes (Ps < 0.01).
Joseph et al., 2019	New Zealand	Audit	100	To estimate the proportion of patients attending the gynaecology outpatient clinic referred with chronic pelvic pain and endometriosis who have	High level of catastrophic thoughts about pain was reported.

				needs unmet by the current biomedical model of care. Pain catastrophising was used as a psychosocial correlate of this complexity.	77% of patients scored in the high or severe range, with 55% endorsing clinically significant scores for helpless catastrophising.
Marki et al., 2022	Hungary	Retrospective	21	To expand knowledge of (i) the difficulties patients have when living with endometriosis and (ii) their opportunities and mechanisms for coping with the negative impact of the disease to implement a proper multidisciplinary approach in practice.	Patients were highly affected by a lack of information and uncertainty caused by endometriosis. A supporting doctor-patient relationship, active coping, and social support were identified as advantages over difficulties.
Netzl et al., 2022	Germany	Cross-sectional	100	To compare the rates of mental disorders, sexual dysfunctions and childhood maltreatment in patients with endometriosis with either chronic pelvic pain or minimal to no pelvic pain so that multidisciplinary treatment options can be identified to improve mental health.	Patients with chronic pelvic pain had higher rates of current mental disorders (P = 0.019), lifetime mental disorders (P = 0.006) and sexual dysfunctions (P <0.001), but not childhood maltreatment (P = 0.074). This highlights the need for interdisciplinary care and cooperation between different healthcare professionals to adequately manage patients with endometriosis.
O'Hara et al. 2020	Australia	Cross-sectional	620	To describe the characteristics and factors associated with the use of different treatment modalities among patients with surgically diagnosed endometriosis.	A range of practitioners had been consulted for endometriosis in the last 12 months, including general practitioners, medical specialists, allied health, and complementary practitioners. Hormonal treatments were used by 59.2% of respondents. 77.7% respondents used pain medications.

					15.4% respondents have a chronic disease management plan
O'Hara et al. 2021	Australia	Cross-sectional	620	To evaluate what self-management factors are associated with quality of life among patients with endometriosis, such that self-efficacy is improved through a structured chronic disease management programme that utilises a multidisciplinary approach.	Physical and mental quality of life were significantly lower among patients with endometriosis ($P < 0.001$). Physical quality of life was positively associated with greater self-efficacy ($P < 0.001$), but negatively associated with age ($P < 0.001$), pain severity ($P < 0.001$), use of prescription medications ($P < 0.001$), having a chronic disease management plan ($P < 0.05$) and number of self-care activities ($P < 0.05$). Mental quality of life was positively associated with being older ($P < 0.001$), partnered ($P < 0.001$), having a university education ($P < 005$), increasing self-efficacy ($P < 0.001$) and higher partners in health scores ($P < 0.001$).
Omtvedt et al., 2022	Norway	Prospective	938	To find out what patients and relatives consider to be the best possible care in terms of multidisciplinary endometriosis and adenomyosis management and potential development of an endometriosis centre, to prioritise resources towards the most needed aspects.	Better patient information, long term therapeutic plans and integration of their partners into their care were the main concerns. Multidisciplinary care was a key issue for the majority, with 89% stating a need for a consultation with a psychologist, 86% at least one consultation with a nutritionist, 85% a physiotherapist, and 78% needing a sex therapist and 99.7% consider research and 99.8% consider quality assurance initiated by the endometriosis centre to be important.

					Need for updated and easily accessible information, meeting competent health care professionals and being taken seriously/listened to.
Pereira et al., 2021	Portugal	Cross-sectional	105	To evaluate the contribution of psychological morbidity in patients with endometriosis to inform a multidisciplinary intervention.	Frequency of sexual activity had an indirect effect on the relationship between patient's sexual satisfaction and psychological morbidity of patients with endometriosis (P = 0.002). Infertility has an indirect effect in the relationship between diagnosis duration and patient's psychological morbidity (P = 0.009). There's a direct effect between perception of severity of symptoms (P = 0.001) and marital satisfaction (P = 0.001) with psychological morbidity of patients with endometriosis.
Rowe et al., 2021	Australia	Cross-sectional	59 (46 patients, 13 health professionals)	To compare patients' and health professionals' perception of quality of endometriosis health care and opportunities for improvements in multidisciplinary care models.	Patients reported that healthcare professionals may dismiss symptoms, lack essential knowledge and provide inconsistent advice; treatments are seldom successful or without adverse side-effects. Health professionals acknowledged limitations in expertise, persistent myths, and challenges in achieving best practice. Enhancing collaborative care skills, individualised treatment plans, and local referral pathways to multidisciplinary care may improve satisfaction with endometriosis care giving and receiving.

Wilkinson et al., 2021	Australia	Retrospective	100	Evaluate the effect of the multidisciplinary Persistent Pelvic Pain Clinic on the frequency and nature of emergency department presentations, admission, regular opiate usage and surgeries performed on patients where 58% of the population had a prior diagnosis of endometriosis	55.7% reduction in ED presentations (P <0.002). Those who had previously required ED presentations pre-clinic experienced a 63.9% reduction in need to present to ED (P <0.001). No difference in the length of stay for those patients who still presented to ED (P = 0.991). 75.8% reduction in short stay admissions (P = 0.006). Those who were known to use regular opiates pre-clinic attendance estimated a significant total reduction in daily oral morphine milligram equivalents of 365mg/day.
Yong et al., 2015	Canada	Prospective	150	To determine the prevalence, associations, and outcome of patients (18.2% had diagnosis of endometriosis) with concurrent deep-superficial dyspareunia in a multidisciplinary vulvodynia program.	At 6 months post-treatment, patients with concurrent deep-superficial dyspareunia improved in the level of dyspareunia pain and in the Female Sexual Distress survey.
Yong et al., 2018	Canada	Prospective	497 (278 followed up at 1 year, 219 lost to follow up)	To follow up deep dyspareunia severity over 1-year prospective cohort at an interdisciplinary centre for pelvic pain and endometriosis. Sexual quality of life was also measured over the 1 year.	Severity of deep dyspareunia improved over 1 year (P <0.001). Sexual quality of life improved (56% to 43% on the sex subscale of the Endometriosis Health Profile) (P < 0.001).

Table 3. Comparing current multidisciplinary care model with patients' needs

Discipline	No. of studies included (reference)	No. of studies suggested (reference)	Patient-reported need (reference)
Gynaecologist	**4** [11-14]	**2** [26, 28]	**3** [15, 16, 28]
Physiotherapist	**4** [11-14]	**3** [4, 15, 28]	**3** [4, 15, 28]
Psychologist	**4** [11-14]	**10** [4, 15, 16, 18, 20-24, 28]	**4** [4, 15, 16, 28]
Pain specialist	**3** [11, 12, 14]	**6** [4, 17, 20, 23, 24, 28]	**1** [15]
Sex therapist	**2** [13, 14]	**4** [15, 24, 26, 28]	**1** [28]
Nurse	**1** [11]	**1** [20]	**0**
Nutritionist / Dietician	**0**	**1** [28]	**2** [15, 28]
Complementary and alternative medicine	**0**	**1** [19]	**4** [4, 15, 16, 19]
Social worker	**0**	**2** [15, 20]	**0**

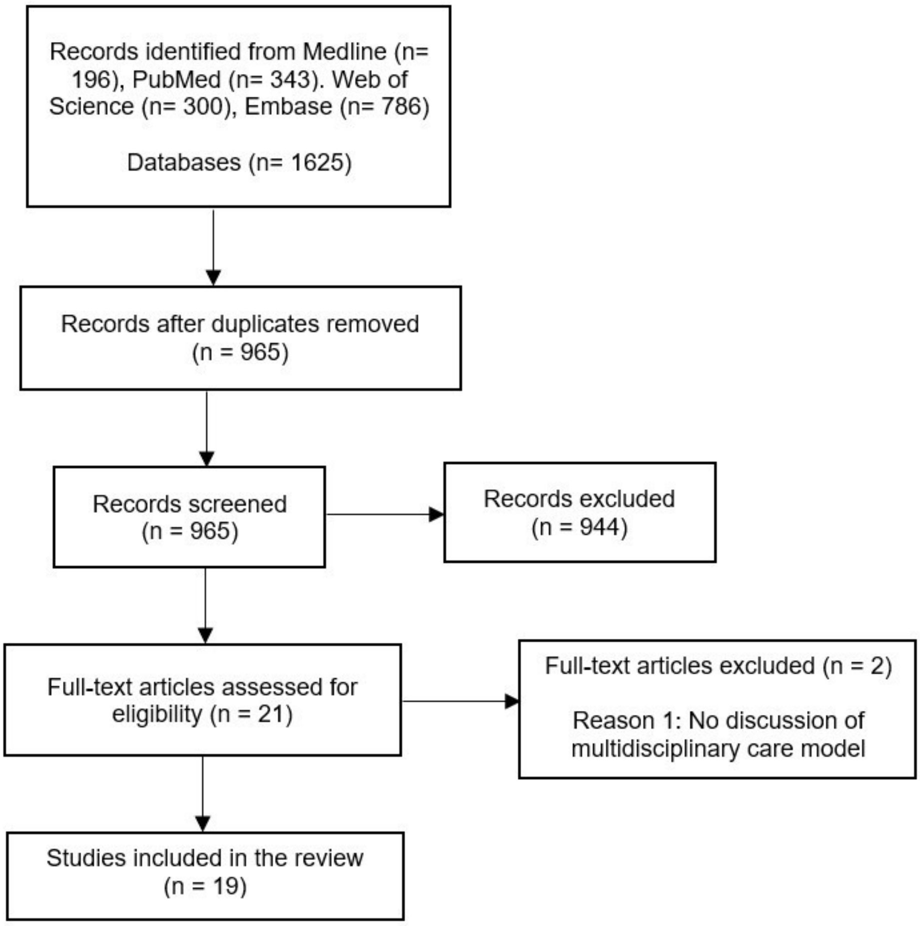
Records identified from Medline (n= 196), PubMed (n= 343). Web of Science (n= 300), Embase (n= 786)
Databases (n= 1625)
Records after duplicates removed (n = 965)
Records screened (n = 965)
Records excluded (n = 944)
Full-text articles assessed for eligibility (n = 21)
Full-text articles excluded (n = 2)
Reason 1: No discussion of multidisciplinary care model
Studies included in the review (n = 19)

Figure 1.jpg