



## Research article

# Patient-centered endometriosis care implementation at tertiary and secondary care hospitals in Indonesia

Achmad Kemal Harzif<sup>a,b,\*</sup>, Beryliana Maya Anisa<sup>a</sup>, Eva Suarthana<sup>c</sup>,  
Cut Rika Maharani<sup>d</sup>, Rusnaidi<sup>d</sup>, Hilwah Nora<sup>d</sup>, Rajuddin<sup>d</sup>, Ade Permana<sup>e</sup>,  
Heidi Dewi Mutia<sup>a</sup>, Nafi'atul Ummah<sup>b</sup>, Putri Nurbaeti<sup>b</sup>,  
Aisyah Retno Puspawardani<sup>b</sup>, Budi Wiweko<sup>a,b</sup>

<sup>a</sup> Department of Obstetrics and Gynecology, Faculty of Medicine, Universitas Indonesia, Jakarta, Indonesia

<sup>b</sup> Human Reproduction, Infertility, and Family Planning Research Center, Indonesian Medical Education and Research Institute, Jakarta, Indonesia

<sup>c</sup> Department of Obstetrics and Gynecology, McGill University, Montréal, Canada

<sup>d</sup> Department of Obstetrics and Gynecology, Faculty of Medicine, Universitas Syiah Kuala, Aceh, Indonesia

<sup>e</sup> Department of Obstetrics and Gynecology, Faculty of Medicine and Health Sciences, Universitas Jambi, Jambi, Indonesia

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## ABSTRACT

**Background:** Endometriosis has a high recurrence rate within five years (40–50 %). High recurrence remarkably reduces Health-Related Quality of Life (HRQOL). Patient-centered endometriosis care (PCEC) is a range of care that respects the patient's preferences and needs while being guided by the patient's values and may provide better treatment for patients. Our study is the first to evaluate the implementation of PCEC in Indonesia.

**Materials and methods:** We evaluated PCEC at Dr. Cipto Mangunkusumo Hospital in Jakarta (Center-1), Raden Mattaher Hospital in Jambi, and dr. Zainoel Abidin Hospital in Aceh (Center-2) from October 2021 to May 2022. Center-1 represented tertiary care, and center-2 represented secondary care. This study used the ENDOCARE Questionnaire (ECQ) instrument, which produced mean important score (MIS), percentage of negative performance (PNP), and patient-centeredness score (PCS) as outcomes. Higher PCS reflects greater patient-centered care of the center.

**Results:** A total of 73 patients were recruited and divided into two groups of centers. Patients from Center-1 had significantly higher patient-centeredness scores vs. patients in centers without the training and guideline: dimension "Respect for patients' values, preferences, and needs" (Center-1 7.33, 6–10, Center-2 6, 6–6;  $p < 0.001$ ), dimension "Coordination and integration of care" (Center-1 6, 4.44–8.67, Center-2 5.5, 4–6;  $p = 0.006$ ), dimension "Information, communication, and education" (Center-1 7.14, 6–8.29, Center-2 5.14, 5.14–6;  $p < 0.001$ ), dimension "Physical comfort" (Center-1 6, 6–8, Center-2 6, 6–6;  $p = 0.033$ ), dimension "Endometriosis clinical staff" (Center-1 6, 6–9, Center-2 6, 6–6;  $p = 0.049$ ). Subjects with higher education and experienced endometriosis recurrences statistically had higher patient-centeredness scores.

**Conclusion:** Our findings suggest that endometriosis training and having endometriosis clinical guidelines could improve patients' experience in receiving PCEC. Information for patients should be made simple so they can understand the purpose of the treatment.

\* Corresponding author. Department of Obstetrics and Gynecology, Faculty of Medicine, Universitas Indonesia, Jakarta, Indonesia.

E-mail address: [kemal.achmad@gmail.com](mailto:kemal.achmad@gmail.com) (A.K. Harzif).

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## 1. Introduction

Endometriosis is the most common cause of chronic pelvic pain in women, with a prevalence in the case group of chronic pelvic pain reaching 60 %. Endometriosis affects 2 %–10 % of the general population and 50 % of infertile women. [1] Although data is still limited in Indonesia, referral institutions have reported that the incidence of endometriosis in women of reproductive age ranges from 10.2 % to 23.8 %. [2] Clinical manifestations of endometriosis include pelvic pain, dysmenorrhea, dyspareunia, and infertility. [1,3]

Endometriosis is a recurring and chronic condition. Endometriosis recurrence rates after medical or surgical treatment were estimated to be 21.5 % at 2 years and 40 %–50 % at 5 years. [1] The recurrence rate of endometriosis patients in Indonesia is still high, including cases that have undergone surgical treatment. This condition can put psychosocial pressure on patients because handling this case takes a long time. [4,5] With these clinical manifestations, endometriosis can reduce the patient's quality of life and decrease work productivity. [6]

In Indonesia, patients suspected of having endometriosis will be referred from their primary care facility to a secondary or tertiary care center. Endometriosis management is exclusively conducted in secondary and tertiary care facilities. Secondary care services are provided in hospitals by specialized physicians, with only a few secondary care facilities having sub-specialists. Tertiary care is also given at hospitals, where sub-specialized physicians typically supply services following well-established guidelines. [7] Clinical guidelines have the potential to enhance the quality of health care, reduce variation in treatment, and provide guidance based on the most recent evidence. Clinical decisions on patient management should be based on the approved guidelines. [8,9] Increased adherence to guidelines may minimize morbidity and improve treatment results. [10] Endometriosis patients may benefit from centers that have sub-specialized physicians and follow well-established criteria.

The patient's preferences and values need to be considered to provide therapy with the best outcome for the patient. [11] Treatment with the concept of patient-centered or patient-centered care is needed to provide better treatment for endometriosis patients. [12] Patient-centered endometriosis care (PCEC) is a range of care that respects the patient's preferences and needs while being guided by the patient's values. [3] To provide endometriosis patients with patient-centered care, it is essential to comprehend their most prevalent values, preferences, and needs. [6] Patient-centered care has the potential to provide numerous benefits, particularly in terms of perceived well-being. Tailoring care in a patient-centered manner may alleviate part of the emotional burden, which is commonly manifested as worse quality of life and increased anxiety and despair. An increase in patient-centered care is associated with improved quality of life and decreased anxiety and depression. [13] Researchers have demonstrated the positive impact of patient-centered care in different healthcare domains on several clinical, psychological, and even financial outcome indicators, such as increased well-being and lower costs. [14–17]

One of the instruments to assess patient-centered endometriosis treatment is the ENDOCARE Questionnaire (ECQ). [3] It has ten dimensions that play a role in shaping PCEC, including the patient's condition and the factors of doctors as service providers and health facilities. Previous qualitative and quantitative studies conducted in Europe showed that PCEC resulted in a positive outcome and was significantly associated with Health-Related Quality of Life (HRQOL) in endometriosis patients. [5] Another study showed that the concept of patient-centered care statistically resulted in shorter treatment durations, lower costs in each case, and higher patient satisfaction points in all aspects. However, only some of these studies are specific to the endometriosis group. [18] Previous systematic reviews regarding patient-centered care of endometriosis patients showed that patients want more effective and safe care. [5] There is insufficient and inconsistent data to support the efficacy of interventions to enhance the patient-centeredness of care from various medical specialties. Therefore, further research is required to determine the effectiveness of patient-centered programs. Furthermore, there are no studies of PCEC implementation in Indonesia; thus, this study is necessary to investigate PCEC implementation in Indonesia.

## 2. Materials and Methods

A cross-sectional study was conducted at three hospitals divided into two centers in Indonesia from October 2021 to May 2022. Consecutive samples were collected from the obstetrics and gynecology polyclinic or endometriosis polyclinic. Center-1 consisted of patients from Dr. Ciptomangunkusumo Hospital in Jakarta, while Center-2 consisted of patients from dr. Zainoel Abidin Hospital in Aceh and Raden Mattaaher Hospital in Jambi. Center-1 represents tertiary care, where service is conducted by sub-specialized doctors with well-established endometriosis treatment guidelines. Center-2 represents secondary care, where service is not entirely conducted by sub-specialized doctors and does not have endometriosis treatment guidelines.

This study used ECQ as the instrument, which had already been tested for validity and reliability in Indonesia. For measuring patient-centeredness score in Indonesia, the ECQ has an overall Cronbach's alpha score  $>0.70$ . [19] The questionnaire consisted of three parts, each with a different function. Demographic and clinical questions made up the first part of the questionnaire. The second part of the questionnaire included statements about different aspects of endometriosis care, consisting of seven different patient-centered aspects. In this part, patients were asked to score between 1 and 4 based on their importance and performance. The third part of the questionnaire was a descriptive comment on the care system and content of the ECQ.

The ECQ generates two values: the Mean Important Score (MIS) and the Percentage of Negative Performance (PNP). The MIS indicates the level of importance of each aspect to the research subjects, with higher values denoting greater importance. On the other hand, the PNP reflects the research subjects' negative perspectives on each aspect, with higher values indicating poorer performance. The Patient-Centered Score (PCS) is obtained from the following formula:  $(MIS \times (100 - PNP)) / 100$  and presented on a 0–10 scale. The higher the score, the greater the patient-centered care of the center. Thus, the assessment was carried out in 3 stages. The first stage was

the specific aspect of care ( $n = 21$ ), the dimensions of patient-centered care ( $n = 7$ ), and the overall score (the last two assessments were the average sum score).

Patients who could not understand the questions or left some questions unanswered were excluded from the study, leaving 73 subjects for the analysis. We used Statistical Package for Social Sciences (SPSS) for Macintosh version 22.0. Data analysis was processed to evaluate patients' demographics and PCEC (i.e., age, ethnicity, education level, currently having sexual partner, and having membership of the endometriosis patients' group). Categorical data were presented as percentages. Numerical data were presented as mean and standard deviation (SD) for normally distributed data, and medians with interquartile range (IQR) when the distributions were abnormal. Univariable analysis was conducted using the Mann-Whitney test to compare medians and an independent  $t$ -test to compare means. The Chi-Square or Fisher test was used to compare percentages between the two centers. Multivariable linear regression analysis was done for PCS by including factors with a  $p$ -value  $< 0.10$ .

This study was approved by the Ethics Committee of the Faculty of Medicine, Universitas Indonesia, under No. KET-669/UN2.F1/ETIK/PPM.00.02/2020. The ethics committee has approved the study to be conducted at Dr. Ciptomangunkusumo Hospital in Jakarta, dr. Zainoel Abidin Hospital in Aceh, and Raden Mattaher Hospital in Jambi. Written informed consent was obtained from all subjects before the study started.

### 3. Results

Of the 73 subjects in the study, the mean age was 36 years, with a mean age of 38 years in Center-1 and 32 years in Center-2 (Table 1). Both centers shared similar ethnic groups. Based on the education level, only 46.93 % of subjects in Center-1 had a university degree, and only 25 % of subjects in Center-2 had a university degree. In both centers, most subjects had intimate partners (Center-1 was 71.42 %, Center-2 was 91.67 %). Only 16.32 % of research subjects at Center 1 were members of the endometriosis group, and no study subjects at Center 2 were members of the endometriosis group.

The mean age of first symptoms of endometriosis in study subjects was 29 years. The study subjects, on average, had experienced symptoms due to endometriosis for six years since the first symptoms appeared. In Center-1, there were 20.40 %, while in Center-2, there were only 4.16 % of subjects who had undergone multidisciplinary surgery. Symptoms of moderate to severe endometriosis were experienced by 30.61 % of subjects at Center-1 and 20.83 % of subjects at Center-2. Table 2 presents the assessment of MIS based on seven aspects.

PNP of each aspect are presented in Table 3. The only significant difference between Center-1 and Center-2 for PNP were the information, communication, and education aspects ( $p < 0.001$ ).

In Table 4, the PCS results revealed that the aspect of "respect for patient's values, preferences, and needs" obtained the highest score in Center-1. Most aspects, except "Emotional support and alleviation of fear and anxiety" and "Involvement of significant others," were significantly higher in Center-1 than Center-2.

In addition, a bivariate analysis was conducted between sexual activity, level of education, age, endometriosis status, and PCS value. The analysis is summarized in Table 5. The analysis results demonstrated a significant relationship between the status of endometriosis recurrence, education level, and having a multidisciplinary surgery with the patient's assessment of the patient-centered endometriosis services provided.

We continue with performing a linear regression of PCS score with independent variables that had  $p$ -value  $< 0.1$  from Table 5. The results show that education level is the independent variable with a significant correlation ( $p = 0.014$ ) after multivariate analysis (Table 6).

**Table 1**  
Sociodemographic and clinical characteristics.

Characteristics	Center 1 (RSCM) % (n = 49)	Center 2 (Non-RSCM) % (n = 24)	p
Age (Mean $\pm$ SD)	38.47 $\pm$ 7.82	32.96 $\pm$ 5.89	<b>0.003</b>
Ethnicity			
Javanese and Sumatran	89.79 (44)	100 (24)	0.164
Eastern Indonesian	10.20 (5)	0 (0)	
Education Level			
University	46.93 (23)	25 (6)	0.07
High school and below	53.06 (26)	75 (18)	
Currently having sexual partner	71.42 (35)	91.67 (22)	0.05
Member of Endometriosis Patients Group	16.32 (8)	0 (0)	<b>0.036</b>
Self-reported symptoms on infertility			
Endometriosis resulting in infertility	59.18 (29)	34.69 (17)	<b>0.043</b>
Tried to become pregnant >12 months without result	32.65 (16)	54.16 (13)	0.078
Was pregnant before	40.81 (20)	29.16 (7)	0.333
Desire to have (more) children in the future	71.42 (35)	9.51 (23)	<b>0.021</b>
Age at first symptoms of endometriosis (Mean $\pm$ SD)	30.57 $\pm$ 9.77	28.62 $\pm$ 5.56	0.369
Years since initial symptoms	8.10 $\pm$ 7.44	4.33 $\pm$ 1.63	<b>0.02</b>
Having a multi-disciplinary surgery	20.40 (10)	4.16 (1)	0.08
Moderate-severe endometriosis at first diagnosis	30.61 (15)	20.83 (5)	0.31
Endometriosis recurrency	81.63 (40)	91.67 (22)	0.34

RSCM: Dr. Ciptomangunkusumo Hospital in Jakarta, SD: standard deviation.

**Table 2**

Mean important score (MIS) of each aspect.

Dimension	Center 1 (Median, percentile 25 <sup>th</sup> – 75 <sup>th</sup> )	Center 2 (Median, percentile 25 <sup>th</sup> – 75 <sup>th</sup> )	p
Respect for patients' values, preferences, and needs	8.67, 4–10	6, 3–7.3	<b>0.001</b>
Coordination and integration of care	6, 4–10	6, 5–8.67	<b>0.012</b>
Information, communication, and education	7.14, 6–10	6, 4.29–9.43	<b>&lt; 0.001</b>
Physical comfort	6, 3–10	6, 3–10	<b>0.034</b>
Emotional support and alleviation of fear and anxiety	6, 4–10	6, 3–8.67	<b>&lt; 0.001</b>
Involvement of significant others	6, 0–10	6, 6–10	<b>0.044</b>
Endometriosis clinical staff	6, 4.50–10	6, 6–10	<b>0.011</b>

**Table 3**

Percentage of negative performance (PNP) of each aspect.

Dimension	Center 1 (Median, percentile 25 <sup>th</sup> – 75 <sup>th</sup> )	Center 2 (Median, percentile 25 <sup>th</sup> – 75 <sup>th</sup> )	p
Respect for patients' values, preferences, and needs	0, 0–66.67	0, 0–0	0.319
Coordination and integration of care	0, 0–33.3	0, 0–66.67	0.084
Information, communication, and education	0, 0–28.57	0, 0–57.14	<b>&lt; 0.001</b>
Physical comfort	0, 0–100	0, 0–100	0.604
Emotional support and alleviation of fear and anxiety	0, 0–100	0, 0–100	0.463
Involvement of significant others	0, 0–100	0, 0–50	0.138
Endometriosis clinical staff	0, 0–50	0, 0–0	0.219

**Table 4**

Patient-centeredness score (PCS) of each aspect.

Dimension	Center-1 (Median, percentile 25 <sup>th</sup> – 75 <sup>th</sup> )	Center-2 (Median, percentile 25 <sup>th</sup> – 75 <sup>th</sup> )	p
Respect for patients' values, preferences, and needs	7.33, 6–10	6, 6–6	<b>&lt; 0.001</b>
Coordination and integration of care	6, 4.44–8.67	5.5, 4–6	<b>0.006</b>
Information, communication, and education	7.14, 6–8.29	5.14, 5.14–6	<b>&lt; 0.001</b>
Physical comfort	6, 6–8	6, 6–6	<b>0.033</b>
Emotional support and alleviation of fear and anxiety	6, 2–7.33	4, 3.5–6	0.068
Involvement of significant others	6, 6–8	6, 6–6	0.183
Endometriosis clinical staff	6, 6–9	6, 6–6	<b>0.049</b>

**Table 5**

Bivariate analysis of variables and PCS.

Variable		% (n)	Median, percentile 25 <sup>th</sup> – 75 <sup>th</sup>	p
Age (years old)	<35	42.47 (31)	5.94, 3.92–10	0.701
	≥35	57.53 (42)	6.30, 3.6–9.67	
Currently having sexual partner	Yes	78.08 (57)	5.98, 3.92–10	0.217
	No	21.92 (16)	6.19, 3.36–9.18	
Education Level	University degree	39.73 (29)	6.13, 3.36–10	<b>0.032</b>
	High school and below	60.27 (44)	5.81, 3.92–9.18	
Endometriosis recurrence	Yes	84.93 (62)	6.40, 5.4–10	<b>0.014</b>
	No	15.07 (11)	5.06, 3.36–9.67	
Having a multidisciplinary surgery	Yes	15.07 (11)	6.71, 6–8.2	<b>0.01</b>
	No	84.93 (62)	5.79, 5.31–6.74	
Duration from first symptoms	<5 years	46.6 (34)	5.89, 5.34–7.89	0.588
	≥5 years	53.4 (39)	6, 5.35–6.98	

PCS: Patient-centeredness score.

#### 4. Discussion

The ages of the subjects were  $38.47 \pm 7.82$  years in Center-1 and  $32.96 \pm 5.89$  years in Center-2, with a p-value of 0.003. The age of the patients in RSCM is higher than a study by Dancet et al., which was  $34 \pm 7$  years, who also assessed patient-centeredness of endometriosis care in Europe using the ENDOCARE questionnaire. [20] In another study conducted by Schreurs et al. in the Netherlands regarding patient-centered endometriosis care in secondary and tertiary health services, the respondents had a median age of 34 in secondary healthcare and 36 in tertiary healthcare. [21] Meanwhile, in Sweden, a study examined a similar topic had respondents age around  $37.2 \pm 9$  years. [22] This shows that endometriosis patients in Indonesia have a longer time to come for endometriosis consultation compared to other countries. However, the age value is not too far from other studies, which illustrates that delayed diagnosis in women with endometriosis also occurs in other countries.

**Table 6**

Multivariate analysis of endometriosis recurrency, having a multidisciplinary surgery, and education level with PCS.

	Variable	B	S.E	Sig	95 % Confidence Interval for B	
					Lower Bound	Upper Bound
<b>Step 1</b>	<b>Endometriosis Recurrency</b>	−0.455	0.459	0.325	−1.371	0.461
	<b>Having a multidisciplinary Surgery</b>	−0.746	0.451	0.103	−1.645	0.154
	<b>Education Level</b>	−0.705	0.329	0.036	−1.362	−0.048
	<b>Constant</b>	9.355	1.064	0.000		
<b>Step 2</b>	<b>Having a multidisciplinary Surgery</b>	−0.721	0.450	0.114	−1.618	0.177
	<b>Education Level</b>	−0.708	0.329	0.035	−1.364	−0.052
	<b>Constant</b>	8.797	0.903	0.000		
<b>Step 3</b>	<b>Education Level</b>	−0.816	0.326	0.014	−1.466	−0.167
	<b>Constant</b>	7.638	0.546	0.000		

PCS: Patient-centeredness score.

Due to the wide range of ethnic diversity in Indonesia, the ethnicities in this study were divided into two, with the most ethnic groups being Javanese and Sumatran, with 89.79 % in Center-1 and 100 % in Center-2. These different ethnicities cause patients to have different attitudes towards their disease and seek help from health professionals. In addition, there were more respondents in the Java and Sumatra regions due to the availability of more adequate health facilities than in other Indonesian regions. [19] Low-quality health care for racial and ethnic minorities has an impact on their health outcomes. Studies have identified disparities in the quality of patient-provider communication and physicians' views toward ethnic minority patients. Consequently, there has been a call for healthcare providers to cultivate cultural sensitivity and adopt a more patient-centric approach. [23] Disparities in race and ethnicity can have an impact on treatment adherence, patient-provider communication, and outcomes. Socioeconomic status, disease features and treatment, and provider biases or discrimination have all been connected to these discrepancies. Nonetheless, there is evidence that racial/ethnic variations also influence these disparities in care in patient-centered care perceptions. [24]

In this study, most of the subjects did not have a bachelor's degree. Only 46.93 % of subjects in Center-1 had a bachelor's degree, and only 25 % of subjects in Center-2 had a bachelor's degree. This finding is different from the study by Dancet et al., where the sample included mostly took higher education (68 %). [20]

Most of the respondents in this study currently have a sexual partner, with Center-1 at 71.42 % and Center-2 at 91.67 %. This result is similar to a study by Schreurs et al., where the majority of respondents in secondary health facilities had intimate partners (85.5 %) as well as tertiary health facilities (92.5 %). [21] Out of all respondents, only 16.1 % of subjects in Center-1 had membership in the endometriosis patient group, while there were no subjects in Center-2 had joined any endometriosis patient group, in contrast to another study where most of the samples had membership in a patients' association (63 %). [20] Respondents who entered the patient group had higher expectations of the therapy they received because they were more aware of their peers' experiences. However, because endometriosis groups are limited and not very well known in Indonesia, only a few respondents enter this group, while the rest do not seek peer support. [19]

A few self-reported symptoms related to infertility were examined, and only endometriosis pain resulting in infertility and the desire to have more children in the future were found to be significantly different, with p-values of 0.043 and 0.021, respectively. The age at which patients first complained of symptoms of endometriosis in Center-1 was  $30.57 \pm 9.77$  years, while in Center-2 was  $28.62 \pm 5.56$  years. This result is higher than studies conducted in Belgium and the Netherlands, which was  $23 \pm 8$  years. This proved that women in Indonesia either tend to experience endometriosis complaints at an older age than women in Europe or consider complaints they experienced as 'normal'. Women and those around them are frequently unaware of endometriosis, and the perception of menstrual pain as something to be endured also contributes to delays in seeking help. [25]

Patient-centered care that is specialized based on the type of disease has begun to be widely applied, especially for chronic diseases that require long-term therapy. The purpose of specializing in patient care is to provide centralized and integrated services by providing multi-disciplinary services in one location. It is hoped that patient satisfaction will increase, and therapy will be more effective. Currently, no studies address the patient-centered treatment of endometriosis and the factors associated with this value. However, the level of patient satisfaction can be considered to correlate with patient-centered treatment of endometriosis.

This study used the ENDOCARE Questionnaire (ECQ), which went through validity and reliability tests in Indonesia. [19] It is also one of the instruments used to evaluate Patient-Centered Endometriosis Care (PCEC). It was found that the significant PNP values were in the information, communication, and education aspects. Women with endometriosis tend to get less information about the disease they are experiencing. Patients often feel confused; therefore, they visit doctors repeatedly to receive explanations. However, their symptoms are normalized, dismissed, or trivialized, resulting in women feeling ignored and disbelieved. [25]

Each aspect of MIS has significant values, meaning all of them are considered to have high importance for women with endometriosis. Assessing PCS is used to determine whether a health facility is sufficiently patient-centered or not. A higher number indicates that the health facility is more 'patient-centric'. From this study, we found that almost all aspects of Patient-Centered Endometriosis Care had significant differences between those two centers. This means that Center-1, with subspecialty service providers with their own Endometriosis Treatment Guidelines, provides better Patient-Centered Endometriosis Care than Center-2. A study by Culley et al. found that women with endometriosis reported to have higher levels of perceived stress compared to the control group because they have compromised quality of life. Patients also tend to hide their symptoms from others, especially friends and family. This made

receiving proper support from their closest ones even harder. [25]

From the bivariate analysis, we found no significant correlation between age and PCS. This result differs from a study by Strömberg et al. Researchers found that younger women with endometriosis experience less patient-centered care than older women. One possible explanation for the higher PCS among older women is that they have better ways of dealing with endometriosis symptoms. [26] A greater PCS is observed in older women due to the fact that physicians interact with patients differently according to age. As a result, older women were more likely than younger patients to engage in patient-centered communication with their physicians. [27]

There is a significant correlation between PCS and education level ( $p = 0.032$ ). Although there is a significant correlation, we could not conclude that it is a causal relationship because the nature of this cross-sectional study. This finding is different from research by Bourion-Bédès et al., which concluded that there is no relationship between patient satisfaction and the patient's sociodemographic status, including education level ( $p = 0.97$ ). [28] In Indonesia, the government requires a minimum of 12 years of education or high school equivalent. Differences in the scope of information and the ability to accept new information will usually be seen in patients who do not receive education up to the high school level and those who receive education according to the time required by the government. Women who receive further education, either diploma, bachelor, or higher education, usually have more critical thinking skills and are able to make choices for themselves. With higher education, patients will find it easier to get health information and consult with medical professionals. Patient-centered care may be impacted because patients with lower education may find it challenging to communicate with medical professionals and obtain health information due to the technical content and complex medical terms found in health-related information. Low health literacy among patients can have detrimental effects, including a lack of awareness about health-related issues, poor chronic illness management, noncompliant prescription use, a rise in emergency department visits, and an increase in hospitalization and mortality. [29]

Having a multidisciplinary surgery also significantly affects patient-centeredness. Collaboration among different medical areas can benefit patients with complex diseases. [30] However, organizational barriers, insufficient funding, inadequate education and training, different professional cultures, and lack of recognition of each other's roles can make interdisciplinary approaches challenging. [30,31] Standardized care pathways should be proposed as an integrated care model to meet the challenges of managing complex care processes where several professions must work together. [23] Durand et al. discovered that when teams collaborate well, patient-centered attitudes improve. Positive patient-centered perceptions result from adaptive and proactive team behaviors. [31]

Endometriosis recurrency has a significant correlation with PCS. Recurrence is one of the causes of morbidity in endometriosis patients. In patients treated with laparoscopy, recurrence occurs in 10–55 % of cases within the first year. Unfortunately, there are no studies that explain the relationship between the endometriosis recurrence rate and the patient's view of the care provided. In this study, we found that patients who experienced recurrences of endometriosis had a perspective that the service given was 'more patient-centered' than the subjects without recurrence. This finding can be interpreted as the health facility providing more 'patient-centered' care after patients experience recurrences. Patients who have been given long-term care can feel the treatment provided is more oriented to their complaints.

In the study of Marama et al., which examined patient satisfaction and related factors in patients treated in obstetrics and gynecology wards, assessing the relationship between patient satisfaction and its relationship to whether the patient had undergone previous treatment showed that patients who had never undergone treatment previously had a satisfaction rate 5.76 times higher than those who had already undergone treatment (AOR = 5.76; 95 % CI = 3.17, 10.47). However, research conducted in Iraq shows other things where patients who have been treated several times at the hospital are more satisfied than patients who have never been treated before at the hospital. [32]

## 5. Conclusion

Endometriosis patients are patients with long-term treatment. Therefore, they need Patient-Centered Endometriosis Care. Based on this study, PCS in centers with services provided by sub-specialized doctors and with endometriosis treatment guidelines were statistically higher compared to centers without those services. Patients with higher education also had a higher PCS than patients with lower education. To improve PCS, facilities should adapt endometriosis guidelines, health facilities need to deliver information in easily understood words, and patient-centered care should be given from the first time when the patient is diagnosed.

## CRedit authorship contribution statement

**Achmad Kemal Harzif:** Writing – review & editing, Writing – original draft, Validation, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Beryliana Maya Anisa:** Writing – review & editing, Writing – original draft, Investigation, Formal analysis, Data curation. **Eva Suarthana:** Writing – review & editing, Validation, Supervision, Methodology, Formal analysis. **Cut Rika Maharani:** Validation, Methodology, Investigation, Data curation. **Rusnaldi:** Validation, Methodology, Investigation, Data curation. **Hilwah Nora:** Validation, Methodology, Investigation, Data curation. **Rajuddin:** Validation, Methodology, Investigation, Data curation. **Ade Permana:** Validation, Methodology, Investigation, Data curation. **Heidi Dewi Mutia:** Writing – review & editing, Validation. **Nafi'atul Ummah:** Writing – review & editing, Validation. **Putri Nurbaeti:** Writing – review & editing, Validation. **Aisyah Retno Puspawardani:** Writing – review & editing, Validation. **Budi Wiweko:** Writing – review & editing, Supervision.



## Ethics statement

The ethics committee has approved the study to be conducted at Dr. Ciptomangunkusumo Hospital in Jakarta, dr. Zainoel Abidin Hospital in Aceh, and Raden Mattaher Hospital in Jambi. Written informed consent was obtained from all subjects before the study started.

## Data availability statement

The datasets analyzed or generated during the study are available upon reasonable request to the corresponding author.

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## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Achmad Kemal Harzif reports financial support was provided by University of Indonesia Directorate of Research and Development. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.heliyon.2024.e39914>.

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