

Original article :

Forecasting of Content Ca 125 Endometriosis Using Logistic Regression Model

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Abstract

Objective : This study is to prove that there is a significant relationship between the absence of students participating in activities at school / on campus and the symptoms of primary dysmenorrhoea experienced during menstruation. Endometriosis is characterized as pain under the abdomen during menstruation. In addition, this study is also to obtain a profile of students and factors that influence primary dysmenorrhoea. A logistic regression model has been used to assess the main factors of dysmenorrhoea among these students.

Methods : The study was conducted at the RSK Permata Hati Malang. A total of 123 students were randomly selected in this study. The factors observed were menarche, menstruation, menstruation period and blood loss volume and CA 125 level. From the logistic regression model, it was found that there were three factors that influence the occurrence of dysmenorrhoea among students, namely menarche, menstruation period and menstrual blood volume. **Results:** The Hosmer and Lemeshow test showed that the measurement model of CA 125 levels in endometriosis was appropriate (Chi square test value was 2.847 with p-value = 0.416). Instead of Press. (3) and Eq. (4), it was found that the contributors to dysmenorrhoea were menstrual length, menstrual discharge and the beginning of menarche. By looking at the odds ratio it is found that the risk of students experiencing dysmenorrhoea is (i) 2.5 times higher for those with longer menstrual periods (ii) 3.7 times higher for those who have menstrual expenditure which is a little and (iii) three times higher for those who have mined it for more than 13 years. **Conclusion:** Significant CA 125 levels were obtained for students and students suffering from dysmenorrhoea. The study also found that the risk of getting dysmenorrhoea increased if students and students had menstrual periods longer than 35 days, menstrual expenditure levels were small and menarche was more than 13 years old.

Keywords: CA 125 level, logistic regression model; dysmenorrhoea and menarche.

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Background

The use of logistic regression models has grown rapidly along with advances in medical science and technology (IPTEKDOK). The use of logistic regression in the field of clinical epidemiological inquiry has been used extensively in fields such as biomolecular, ecology, clinical pharmacological investigations. Logistic regression analysis was first reserved by Cox (2010). The logistic regression model is a test of a linear model as introduced by Nelder and Wedderburn (2012). Hosmer and Lemeshow (2000) have discussed logistic regression models.

This paper discusses the use of logistic regression models to predict endometriosis among Malang students. Dysmenorrhoea is pain that is felt under the abdomen during menstruation. Dysmenorrhoea is a pain often faced by women. Endometriosis can cause students to not attend school / college. Sardjana (2018) has found that 20% of Malang students experience endometriosis and cannot go to school. Syamsul and colleagues (2017) report that 10% of career women experience serious pain caused by dysmenorrhoea and are not allowed to work. Alkaff (2016) reported that 52% of students in Yogyakarta were unable to do their daily

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activities well during menstruation.

Data

The study was conducted among students. A total of 123 students were randomly selected to answer the research questionnaire. Five non-leaning scales were selected for analysis.

Schedule 1. Change of study

Changes to Coded	Letters	Kod
Dys	experincing dismenorea or no	
Dura 1	Menstrual period	
Leng 1	Long time around menstruation	
Menarke	The beginning of the menarke	
Mens 1	Level of expenditure	
Reg	Menstruation is normal	

Logistic Regression Model

If $\pi(x) = E(Y/x)$ is a conditional min if the distribution of logistics is used, then the logistic regression model is defined as follows:

$$\pi(x) = \frac{1}{1 + \exp\left\{-\left(\beta_0 + \sum_{i=1}^n \beta_i x_i\right)\right\}}$$

(1)

where $\beta_0, \beta_1, \dots, \beta_n$ are for non-leaning allowances and x_1, x_2, \dots, x_n are non-leaning change makers. Logit incarnation of terhadap (x), provides logit for logit regression models for logistic regression models such as the following:

$$g(x) = \ln\left(\frac{\lambda(x)}{1 - \lambda(x)}\right) = \beta_0 + \beta_1 X_1 + \dots + \beta_n X_n \tag{2}$$

Results and Analysis Step 2 provides pertinaian statistics as well as two chi-square tests conducted to determine whether there are differences between herds with dysmenorrhoea and non-dysminorrhea. From the steps it was found that the level of menstrual discharge and menstrual length gave a significant difference to dysmenorrhoea. Although menarke, the prevalence of menstruation and menstrual period is not meaningful. Using the backward logistic regression method using the exclusion criteria through the probability ratio test, the linear logistic regression model is given as follows:

$$\pi(x) =$$

1

$$1 + \exp\left\{-\left(0,099 - 0,916x_1 + 1,132x_2 - 1,077x_3\right)\right\}$$

(3)

where x_1 is the menstrual period, x_2 is the rate of menstrual expenditure and x_3 is the beginning of menarke.

Schedule 2. Menstrual cycle patterns for students

Characteristic	Dismenorea n = 71	Not Dismenorea n = 52	P-value for the khi-kuasadua test
Menarke			
Min	12,86	12,98	
Sisihan piawai	1,23	1,20	0,770
11-12 year	32	23	
13 year	24	11	
14-16 year	15	18	
Normal menstruation	58	44	0,400
Not normal	13	7	
Tempoh kitaran			
<= 30 hari	57	35	
> 30 hari	9	14	0,048
Periode menstruaation			
<= 6 day	42	26	
> 6 day	28	24	0,383
menstrual discharge levels			
Lots	48	46	
a little	22	6	0,010

Then, the logit for the logistic regression model is given by:

$$g(x) = \ln\left(\frac{\lambda(x)}{1 - \lambda(x)}\right) = 0,099 - 0,916x_1 + 1,312x_2 - 1,077x_3 \tag{4}$$

The Hosmer and Lemeshow tests show that the model fits well (the value of the second chi-power test is 2.847 with a p-value = 0.416). Instead of Press. (3) and Eq. (4), it was found that the contributors to dismenortea were menstrual length, menstrual discharge and the start of menarke. By looking at the odds ratio it is found that the risk of students experiencing dysmenorrhoea is (i) 2.5 times higher for those who have high menstrual cycle periods, (ii) 3.7 times higher for those who has a small amount of menstrual expenditure and (iii) is three times higher for those who have menarcheenya more than 13 years.

Conclusion

From the research it was found that the prevalence of dysmenorrhoea among Malang students was 58% and 20% reported being unable to attend college due to dysmenorrhoea. Press (4) provides

the logit for a logistic linear regression model. From this model, it can be concluded that the three factors that influence dysmenorrhoea are the length of the menstrual period, the level of menstrual discharge and the start of menarche while the menstrual period and the prevalence of menstruation are not significant. This decision is the same as the research conducted by Andersch and Milsorm (in Ng and colleagues (2012)).

Other studies such as Harlow and Park (in Ng and

colleagues (2012)) and Sundell and colleagues are [Ng and colleagues (2012)] found dysmenorrhoea is influenced by several alterations including menarche and increased menstrual tempo. The study also found that the risk of experiencing dysmenorrhoea increases if students have a high menstrual cycle tempo, levels of menstrual expenditure are low and menarche is more than 13 years old.

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