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Original Research

DIFFERENCES OF MATERNAL SOCIODEMOGRAPHIC CHARACTERISTICS WITH SPONTANEOUS PRETERM BIRTH AMONG HOSPITALS IN INDONESIA: A COMPARATIVE STUDY

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ABSTRACT
Background: Maternal sociodemographic characteristics can be used to prevent preterm birth.
Objective: To identify differences in maternal sociodemographic characteristics with spontaneous preterm birth among hospitals in East Java, Indonesia.
Methods: This was a descriptive study with comparative design in 134 mothers who experienced preterm birth at eight hospitals. Data were analyzed using Independent samples t-test.
Result: Sixteen variables were significantly different in maternal sociodemographic characteristics with spontaneous preterm birth among eight hospitals, namely: gestational age (CI 95%:10.97-0.02, p <0.049), maternal age (CI 95%:0.46-11.03, p <0.035), smoking (CI 95%:9.98-19.01 p <0.001), Edinburgh Postnatal Distress Scale (EPDS) (CI 95%:6.90-17.09, p <0.001), the fetus mobile (CI 95%:2.41-11.58, p <0.006), the number of visits during pregnancy (CI 95%:5.63-14.36, p <0.001), history of premature (CI 95%:7.76-15.73, p <0.001), history of disease (CI 95%:9.02-18.97, p <0.001), history of abortion (CI 95%:9.34-18.65, p <0.000), height (CI 95%:9.66-18.83, p <0.001), BMI (CI 95%:0.75-11.74, p <0.029), Mid Upper Arm Circumference (MUAC) (CI 95%:2.53-12.96, p <0.007), periodontal infection by (CI 95%:6.04-15.45, p <0.001), bleeding in young and old pregnancy (CI 95%:7.71-17.28, p <0.001), anemia status (CI 95%:2.30-10.19, p <0.004) and BV status (CI95%:9.05-20.45, p <0.001).
Conclusion: There were significant disparities in maternal sociodemographic characteristics with preterm birth among hospitals. Our findings can be used as the basic data for future research in an effort to prevent premature birth disorders based on maternal sociodemographic characteristic.

Keywords: sociodemographic characteristics, hospitals, preterm birth, Indonesia

BACKGROUND

Preterm birth is influenced by many of risk factors. Robinson and Nortwitz (2017) collected several sociodemographic risk factors from several theories, including absence of partner, low socioeconomic, anxiety and stress, depression (life problems such as divorce, separation, death), ever surgery during pregnancy, workplace problems, multiple pregnancy, polyhydramnios, uterine abnormalities, Ketosis-Prone Diabetes, history of second-trimester abortion, history of cervical surgery,

short length of the cervix, STI, infectious disease, bacteriuria, periodontal disease, placenta previa, placental abruption, vaginal bleeding , previous history of preterm birth, drug abuse, smoking, maternal age, African-American race, low BMI nutrition, inadequate prenatal care, anemia, excessive uterine contractions, low education level, fetal anomalies, impaired fetal growth, environmental factors (e.g. heat and air pollution), fetal death, and positive fibronectin. According to Cunningham et al., (2014), the highest risk of preterm birth is a history of previous birth itself.

Preterm classification according to gestational age were between 20-37 weeks, earlier preterm birth between 20-23 weeks, early preterm birth between 24-33 weeks, and late preterm birth between 34-36 weeks (Berghella, 2017). While according to WHO (2015) birth that occurs between 28 weeks gestation to less than 37 weeks (259 days) calculated from the first day of the last menstrual period in the 28-day cycle. Preterm birth is still a problem in the world including Indonesia. Related to the prevalence, perinatal morbidity and mortality are the main causes of infant mortality and the second cause of death after pneumonia in children under five years old (Erez, 2013). The incidence of preterm birth is different in each country, in Europe the figure was 5-11%, while in the USA was 11.5%. In developing countries the number of occurrences is still much higher, for example in Sudan around 31%, India 30%, and South Africa 15% (Osterman et al., 2015), while Indonesia ranks 5th largest from 184 countries in 2010 (WHO, 2010 in Purisch and Cynthia, 2017). More than one million babies die of preterm birth every year in the world or 1 baby every 30 seconds (Berghella, 2017).

METHODS

Study design

This was a descriptive study with comparative design. This study was conducted from November 2017 to July 2018 in 8 hospitals in East Java, Indonesia.

Sample

The samples were all mothers after preterm birth recorded in medical records at 8 hospitals, i.e. Soewandhi hospital, Universitas Airlangga hospital, Islam Jemur Sari hospital, Sidoarjo hospital, Madiun Sogaten hospital, Jombang hospital, Ibnu Sina Gresik hospital, and Ngawi hospital. The inclusion criteria were spontaneously preterm birth mothers 6 hours-3 days, spontaneous single pregnancy without complications, could communicate well, and have a health record book. The exclusion criteria were all deliveries with complications or abnormalities such as hypertension in pregnancy, pregnancy with diabetes mellitus, multiple pregnancies, hydramnios, antepartum bleeding, uterine anatomic abnormalities, pregnancy with tumors, and congenital abnormalities of the fetus.

Instrument

The sociodemographic instrument was developed by the researchers for data collection, including gestational age, mother's age, education, occupation, number of children, parity, distance of pregnancy, weightlifting work, smoking, EPDS, fetus mobile, sleeping time, number of visits during pregnancy, history of preterm birth, history of disease, second-trimester abortion history, social economy, previous child's sex, body weight (BW), body mass index (BMI), upper arm circumference, periodontal infection, bleeding in young and old pregnancy, anemia status, status of bacterial vaginosis (BV).

Statistical analysis

Data were analyzed using independent T-test to compare the differences in maternal sociademographic characteristics (Sastroasmoro and Ismail, 2014).

Ethical consideration

This study has been approved by the Medical Faculty of Medicine of of Airlangga University. The researchers assured that all participants have obtained appropriate informed consents.

RESULTS

Participants' characteristics

The number of respondents was 134 mothers with spontaneous preterm birth in 8 hospitals i.e. Jemur Sari Hospital with 25 respondents (18.7%), Soewandhi Hospital with 14 respondents (10.4%), Airlangga Hospital with 25 respondents (18.7%), Gresik, Jombang and Ngawi Hospital with 12 respondents respectively (9.0%), Sidoarjo Hospital with 24 respondents (17.9%), and Madiun Hospital with 10 respondents (7.5%) (See **Table 1**).

Table 1 Percentage of maternal sociodemographic characteristics with preterm birth among hospitals

Sociodemographic characteristics	Hospital 1	Hospital 2	Hospital 3	Hospita l 4	Hospital 5	Hospital 6	Hospital 7	Hospital 8
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Gestational age								
24-33 weeks	5 (3.7)	6 (4.5)	3 (2.2)	5 (3.7)	14 (10.4)	6 (4.5)	3 (2.2)	3 (2.2)
34-36 weeks	20 (14.9)	8 (6.0)	22 (16.4)	7 (5.2)	10 (7.5)	6 (4.5)	7 (5.2)	9 (6.7)
Mother's age								
20-35 weeks	22 (16.4)	7 (5.2)	16 (11.9)	5 (3.7)	17 (12.7)	11 (8.2)	7 (5.2)	5 (3.7)
<20/>35 weeks	3 (2.2)	7 (5.2)	9 (6.7)	7 (5.2)	7 (5.2)	1 (0.7)	3 (2.2)	7 (5.2)
Education								
>Senior High School	8 (6.0)	5 (3.7)	8 (6.0)	7 (5.2)	17 (12.7)	10 (7.5)	9 (6.7)	2 (1.5)
<Senior High School	17 (12.7)	9 (6.7)	17 (12.7)	5 (3.7)	7 (5.2)	2 (1.5)	1 (0.7)	10 (7.5)
Occupation								
Housewives	13 (9.7)	7 (5.2)	16 (11.9)	6 (4.5)	17 (12.7)	10 (7.5)	3 (2.2)	11 (8.2)
Civil Servants/Entrepreneur	12 (9.0)	7 (5.2)	9 (6.7)	6 (4.5)	7 (5.2)	2 (1.5)	7 (5.2)	1 (0,7)
Number of children								
< 2 people	14 (10.4)	10 (7.5)	11 (8.2)	5 (3.7)	15 (11.2)	9 (6.7)	6 (4.5)	6 (4.5)
>2 people	11 (8.2)	4 (3.0)	14 (10.4)	7 (5.2)	9 (6.7)	3 (2.2)	4 (3.0)	6 (4.5)
Parity								
Multipara	15 (11.2)	7 (5.2)	14 (10.4)	8 (6.0)	10 (7.5)	8 (6.0)	6 (4.5)	9 (6.7)
Primipara	10 (7.5)	7 (5.2)	11 (8.2)	4 (3.0)	14 (10.4)	4 (3.0)	4 (3.0)	3 (2.2)
Pregnancy Distance								
<2 years	19 (14.2)	7 (9.7)	13 (9.7)	6 (4.5)	16 (11.9)	5 (3.7)	6 (4.5)	5 (3.7)
>2 years	6 (4.5)	7 (9.0)	12 (9.0)	6 (4.5)	8 (6.0)	7 (5.2)	4 (3.0)	7 (5.2)
Weightlifting work								
<5 hr/day	17 (12.7)	3 (2.2)	18 (13.4)	10 (7.5)	12 (9.0)	9 (6.7)	5 (3.7)	12 (9.0)
>5 hr/day	8 (6.0)	11 (8.2)	7 (5.2)	2 (1.5)	12 (9.0)	3 (2.2)	5 (3.7)	-
Smoking								
No	21 (15.7)	14 (10.4)	23 (17.2)	8 (6.0)	24 (17.9)	12 (9.0)	9 (6.7)	12 (9.0)
Yes	4 (3.0)	-	2 (1.5)	4 (3.0)	-	-	1 (0.7)	-
EPDS								
Mild/Medium (score 0-12)	22 (16.4)	8 (6.0)	23 (17.2)	9 (6.7)	21 (15.7)	11 (8.2)	9 (6.7)	12 (9.0)
Heavy: score >13	3 (2.2)	6 (4.5)	2 (1.5)	3 (2.2)	3 (2.2)	1 (0.7)	1 (0.7)	-
Fetus mobile								
Mobile>4x/half an hour	17 (12.7)	10 (7.5)	20 (14.9)	5 (3.7)	13 (9.7)	10 (7.5)	8 (6.0)	12 (9.0)
Less mobile <4x/half an hour	8 (6.0)	4 (3.0)	5 (3.7)	7 (5.2)	11 (8.2)	2 (1.5)	2 (1.5)	-
Sleeping time								
7-8 hour/day	11 (8.2)	10 (7.5)	8 (6.0)	5 (3.7)	10 (7.5)	3 (2.2)	8 (6.0)	1 (0.7)
<7/>9 hour/day	14 (10.4)	4 (3.0)	17 (12.7)	7 (5.2)	14 (10.4)	9 (6.7)	2 (1.5)	11 (8.2)
Number of visits during pregnancy	19 (14.2)	11 (8.2)	22 (16.4)	11 (8.2)	18 (13.4)	10 (7.5)	8 (7.5)	8 (6.0)
>4 times	6 (4.5)	3 (2.2)	3 (2.2)	1 (0.7)	6 (4.5)	2 (1.5)	2 (1.5)	4 (3.0)
<4 times								
History of preterm birth								
Never	20 (14.9)	12 (9.0)	21 (15.7)	10 (7.5)	19 (14.2)	12 (9.0)	9 (6.7)	11 (8.2)
1-2/>2 times	5 (3.7)	2 (1.5)	4 (3.0)	2 (1.5)	5 (3.7)	-	1 (0.7)	1 (0.7)
History of disease								
None	23 (17.2)	12 (9.0)	25 (18.7)	12 (9.0)	21 (15.7)	10 (7.5)	9 (6.7)	11 (8.2)
Yes	2 (1.5)	2 (1.5)	-	-	3 (2.2)	2 (1.5)	1 (0.7)	1 (0.7)

Second-trimester abortion history	24 (17.9)	13 (9.7)	23 (17.2)	12 (9.0)	20 (14.9)	12 (9.0)	9 (6.7)	10 (7.5)
None	1 (0.7)	1 (0.7)	2 (1.5)	-	4 (3.0)	-	1 (0.7)	2 (1.5)
1-2/>2 times								
Social economy								
>Rp.3.045.000	19 (14.2)	7 (5.2)	11 (8.2)	10 (7.5)	10 (7.5)	6 (4.5)	9 (6.7)	-
<Rp.3.045.000	6 (4.5)	7 (5.2)	14 (10.4)	2 (1.5)	14 (10.4)	6 (4.5)	1 (0.7)	12 (9.0)
Previous Child's Sex								
Daughter	6 (4.5)	6 (4.5)	12 (9.0)	3 (2.2)	12 (9.0)	6 (4.5)	5 (3.7)	5 (3.7)
Son	19 (14.2)	8 (6.0)	13 (9.7)	9 (6.7)	12 (9.0)	6 (4.5)	5 (3.7)	7 (5.2)
Body Weight (BW)								
>145 cm	23 (17.2)	12 (9.0)	23 (17.2)	11 (8.2)	22 (16.4)	11 (8.2)	10 (7.5)	12 (9.0)
<145 cm	2 (1.5)	2 (1.5)	2 (1.5)	1 (0.7)	2 (1.5)	1 (0.7)	-	-
Body Mass Index (BMI)								
18,5-25 Kg/m^2	20 (14.9)	11 (8.2)	16 (11.9)	10 (7.5)	20 (14.9)	2 (1.5)	7 (5.2)	6 (4.5)
<18,5/>35 Kg/m^2	5 (3.7)	3 (2.2)	9 (6.7)	2 (1.5)	4 (3.0)	10 (7.5)	3 (2.2)	6 (4.5)
Upper arm circumference								
>23.5 cm	23 (17.2)	9 (6.7)	15 (11.2)	10 (7.5)	10 (7.5)	10 (7.5)	9 (6.7)	12 (9.0)
<23.5 cm	2 (1.5)	5 (3.7)	10 (7.5)	2 (1.5)	14 (10.4)	2 (1.5)	1 (0.7)	-
Periodontal infection								
None	18 (13.4)	12 (9.0)	24 (17.9)	12 (9.0)	14 (10.4)	9 (6.7)	9 (6.7)	12 (9.0)
Yes	7 (5.2)	2 (1.5)	1 (0.7)	-	10 (7.5)	3 (2.2)	1 (0.7)	-
Bleeding in young and old pregnancy	20 (14.9)	14 (10.4)	25 (18.7)	12 (9.0)	16 (11.9)	10 (7.5)	8 (7.5)	12 (9.0)
None	5 (3.7)	-	-	-	8 (6.0)	2 (1.5)	2 (1.5)	-
Yes								
Anemia status								
Hb normal: 10.5-11 g/dl	16 (11.9)	12 (9.0)	13 (9.7)	7 (5.2)	16 (11.9)	10 (7.5)	8 (6.0)	10 (7.5)
Hb abnormal: <10.5 g/dl	9 (6.7)	2 (1.5)	12 (9.0)	5 (3.7)	8 (6.0)	2 (1.5)	2 (1.5)	2 (1.5)
Status of Bacterial vaginosis (BV)	25 (18.7)	14 (10.4)	24 (17.9)	12 (9.0)	23 (17.2)	6 (4.5)	10 (7.5)	12 (9.0)
Not inspected	-	-	1 (0.7)	-	1 (0.7)	6 (4.5)	-	-
Positive								

Remarks: 1: Jemur Sari Hospital, 2: Soewandhi Hospital, 3: Airlangga Hospital, 4: Gresik Hospital, 5: Sidoarjo Hospital, 6: Jombang Hospital, 7: Madiun Hospital, 8: Ngawi Hospital

Differences in maternal sociodemographic characteristics with preterm birth among hospitals

Our analysis showed that, out of 25 variables, only 16 significant variables had significant difference among hospitals, namely: gestational age (p <0.049), maternal age (p <0.035), smoking (p <0.001), EPDS (p <0.001), fetal immovable (p <0.006), number of visits during pregnancy (p <0.001), history of preterm (p <0.001), history of disease (p <0.001), history of abortion (p <0.001), height (p <0.001), BMI (p <0.029), upper arms circumference (p <0.007), periodontal infection (p <0.001), bleeding young/old pregnancy (p <0.001), anemia status (p <0.004), and BV status (p <0.001) (see **Table 2**).

Table 2 Analysis of differences in maternal sociodemographic characteristics with preterm birth among hospitals

Sociodemographic characteristics	Mean difference		95% CI of the difference		T	P value*
	Group 1	Group 2	Lower	Upper		
Gestational age	5.63	11.13	-10.97	-0.02	-2.155	0.049
Mother's age	11.25	5.50	0.46	11.03	2.335	0.035
Education	10.38	6.38	-5.92	5.42	-0.095	0.926
Occupation	10.38	6.38	-0.58	8.58	1.872	0.082
Number of Child	9.50	7.25	-1.81	6.31	1.186	0.255
Parity	9.63	7.13	-1.45	6.45	1.355	0.197
Pregnancy period	9.63	7.13	-2.05	7.05	1.177	0.259
Weightlifting work	10.75	6.00	-0.37	9.87	1.989	0.067

Smoking	15.37	1.37	8.98	19.01	5.992	0.001
EPDS	14.38	2.38	6.90	17.09	5.054	0.001
Fetal movements	11.88	4.88	2.41	11.58	3.276	0.006
The amount of sleep	7.00	9.75	-7.57	2.07	-1.222	0.242
Number of visits during pregnancy	13.38	3.38	5.63	14.36	4.916	0.001
History of premature birth	14.25	2.50	7.76	15.73	6.321	0.001
History of Mother's Sickness	15.38	1.38	9.02	18.97	6.031	0.001
History of Abortion	15.38	1.38	9.34	18.65	6.451	0.001
Social economy	9.00	7.75	-4.34	6.84	0.479	0.639
Child's sex	6.88	9.88	-7.30	1.30	-1.494	0.157
Height	15.50	1.25	9.66	18.83	6.671	0.001
BMI	11.50	5.25	0.75	11.74	2.440	0.029
Upper arms circumference (MUAC)	12.25	4.50	2.53	12.96	3.185	0.007
Periodontal infection	13.75	3.00	6.04	15.45	4.900	0.001
Bleeding	14.63	2.13	7.71	17.28	5.603	0.001
Anemia	11.50	5.25	2.30	10.19	3.398	0.004
BV Status	15.75	1.00	9.05	20.45	5.550	0.001

*Analysis used by independent sample T test

DISCUSSIONS

Findings showed that only 16 variables had significant differences in sociademographic characteristics. Our discussion is described in each variable. *Gestational age*, indicated that the average gestational age of preterm birth was significantly different among hospitals, as the age of early preterm birth (24-33 weeks) has an average of 5 mothers in every hospital. The highest number in Sidoarjo Hospital by 10 mothers (10.4%) and late preterm birth (34-36 weeks) has an average of 11 mothers per hospital with the highest number in Airlangga Hospital by 22 mothers (16.4%).

Maternal age, indicated that the average age of preterm birth was significantly different between hospitals. Maternal age at 20-35 years has an average of 11 mothers per hospital, with the largest number at the Jemur Sari Hospital by 22 mothers (16.4%) and maternal age <20 /> 35 years had an average of 5 mothers per hospital, with the highest number in Airlangga Hospital by 9 mothers (6.7%). According to Fuchs et al., (2018) that maternal age (40 years and over) was associated with preterm birth and a maternal age of 30±34 years was associated with the lowest risk of prematurity.

Smoking, indicated that the average smoking habit of preterm birth was significantly different between hospitals, namely mothers who did not have a smoking habit have an average of 15 mothers per hospital, with the highest number in Sidoarjo Hospital by 24 mothers (17.9%) and mothers who had smoking habits had an average of 1 mother per hospital, with the highest number in Jemur Sari Hospital and Gresik Hospital by 4 mothers respectively (3.0%). According to Baron et al., (2016) that mothers who consumed cigarettes ≥10 cigarettes per day were associated with preterm birth (OR 2.44; CI 95% 1.11-5.37) compared to mothers who consumed cigarettes ≤10 cigarettes per day (OR 1.07; 95% CI 0.57-2.00). Whereas according to Sentilhes et al., (2017) that among preventable risk factors of spontaneous prematurity, only cessation of smoking is associated with decreased prematurity.

EPDS, indicated that the average preterm birth of EPDS was significantly different between hospitals, i.e., mothers who have mild and moderate EPDS (score 0-12) have an average of 14 mothers per hospital, with the highest number at Jemur Sari Hospital by 22 mothers (16.4%) and mothers who had severe EPDS (score> 13) had an average of 2 mothers per hospital, with the highest number found in Soewandhi Hospital by 6 mothers (4, 5%). Rallis et al., (2014) said that higher depression scores in early pregnancy were proven to predict anxiety and higher stress values in late pregnancy. According to Baron et al., (2016) mothers who consumed cigarettes ≥10

cigarettes per day were associated with preterm birth (OR 2.44; CI 95% 1.11-5.37) compared to mothers who consumed cigarettes ≤10 cigarettes per day (OR 1.07; 95% CI 0.57-2.00).

Fetal movement, indicated that the average movement of the fetus preterm birth was significantly different between hospitals, i.e., mothers who have fetal movements >4x/half hour had an average of 14 mothers per hospital, with the highest number in Airlangga Hospital by 20 mothers (14.9%) and mothers who have fetal movements <4x/half hour have an average of 2 mothers per hospital, with the largest number being in Sidoarjo Hospital by 11 mothers (8.2%).

The number of ANC visits during pregnancy, indicated that the average number of ANC visits during pregnancy preterm labor was significantly different between hospitals, namely mothers who visited ANC >4 times during pregnancy had an average of 13 mothers per hospital. With the highest number in Airlangga Hospital by 22 mothers (16.4%) and mothers who visited ANC <4 times during pregnancy had an average of 3 mothers per hospital, with the highest number being in Jemur Sari and Sidoarjo hospital which was 6 mothers each (4.5%). According to the Ministry of Health (2013) at least 4 visits during pregnancy, namely first trimester one visit (before 14 weeks gestation), second trimester one visit (before 14-28 weeks gestation), third trimester two visits (gestational age between 28-36 weeks and after gestational age> 36 weeks).

The history of preterm birth in previous pregnancies, indicated that the average history of preterm birth was significantly different between hospitals, i.e., mothers who did not have a history of preterm birth had an average of 14 mothers per hospital, with the highest number in Jemur Sari Hospital has 20 mothers (14.9%) and mothers who have a history of preterm birth have an average of 2 mothers per hospital, with the highest number in Jemur Sari Hospital and Sidoarjo Hospital, each with 5 mothers (3.7%).

History of disease, indicated that the average history of preterm birth was significantly different between hospitals, i.e., mothers who did not have a history of disease had an average of 15 mothers per hospital, with the highest number in Jemur Sari Hospital by 23 mothers (17.2 %) and mothers who have a history of disease have an average of 1 mother per hospital, with the highest number in Sidoarjo Hospital by 3 mothers (2.72%).

History of abortion in the second trimester, indicated that the average history of preterm birth abortion was significantly different between hospitals, i.e., mothers who did not have a history of abortion had an average of 15 mothers per hospital, with the highest number at the Jemur sari was 24 mothers (17.9%) and mothers who have a history of abortion have an average of 1 mother per hospital, with the highest number in Sidoarjo Hospital by 4 mothers (3.0%).

Height, indicated that the average of preterm birth was significantly different between hospitals, i.e., mothers who have height >145 cm have an average of 15 mothers per hospital, with the highest number in Jemur Sari and Airlangga Hospital by 23 mothers each (17.2%) and mothers who have height <145 cm have an average of 1 mother per hospital and were found in all hospitals, except Madiun and Ngawi Hospital, there were no mothers have height <145 cm.

BMI, indicated that the average preterm birth BMI was significantly different between hospitals, namely mothers who had a BMI of 18.5-25 Kg/m2 had an average of 11 mothers per hospital, with the highest number in Jemur Sari and Sidoarjo Hospital which were 20 mothers each (14.9%) and mothers who have a BMI <18.5 /> 35 Kg/m^2 have an average of 5 mothers per hospital, with the highest number being in Jombang Hospital, there were 10 mothers (7.5%). According to Oyston & Groom (2016) that the risk of preterm birth occurs in mothers with BMI <18.5 Kg/m^2 when compared to normal maternal BMI (RR 1.22), as well as mothers with a BMI> 35 Kg/m^2 also increases the risk of preterm birth

(OR 1.5-1.8).

MUAC, indicated that the average preterm birth BMI was significantly different between hospitals, i.e., mothers who had MUAC >23.5 cm had an average of 11 mothers per hospital, with the highest number in the Jemur Sari and Sidoarjo Hospital, with 23 mothers each (17.2%) and mothers who had <23.5 cm MUAC had an average of 5 mothers per hospital, with the highest number in Jombang Hospital, namely 14 mothers (10.4%). According to Shah et al., (2014), the risk of preterm birth was higher in mothers who had MUAC ≤250 mm and showed less nutrition (RR: 1.26, CI 95%, 1.17, 1, 35).

Periodontal infection, indicated that the average periodontal infection of preterm birth was significantly different among hospitals, i.e., mothers who have experienced periodontal infection have an average of 13 mothers per hospital, with the largest number being in Airlangga Hospital that was 24 mothers (17.9%) and mothers who had never experienced periodontal infections had an average of 3 mothers per hospital, with the highest number in Sidoarjo Hospital, by 10 mothers (7.5%). According to Daalderop et al., (2017) based on reverage result his review for periodontal disease was 5% -38% for preterm birth and 6%-41% for LBW. Although according to Sutherland et al., (2017) that periodontal treatment did not affect preterm birth, so this study only gave different perondontal infection among hospitals, and not after given treatmeant during pregnancy.

Bleeding in young/elderly pregnancy, indicated that the average periodontal infection of preterm birth was significantly different between hospitals, i.e., mothers who have never experienced bleeding in a young/elderly pregnancy have an average of 14 mothers per hospital, with the highest number found in Jemur Sari by 20 mothers (14.9%) and mothers who had experienced bleeding in a young/old pregnancy had an average of 2 mothers per hospital, with the highest number in Sidoarjo Hospital by 8 mothers (6.0%).

Anemia status, indicated the average anemia status of preterm birth was significantly different between hospitals, like mothers who have normal Hb: 10.5-11 g/dl have an average of 11 mothers per hospital, with the highest number is in Jemur Sari and Sidoarjo Hospital which were 16 mothers each (11.9%) and mothers who have abnormal Hb: <10.5-11 g/dl have an average of 5 mothers per house sick, with the highest number in Airlangga Hospital by 12 mothers (9.0%).

BV status, indicated that the average BV status of preterm birth was significantly different between hospitals, i.e., mothers who did not do BV had an average of 15 mothers per hospital, with the highest number at Jemur Sari Hospital by 25 mothers (18.7%) and mothers who had done BV testing had an average of 1 mother per hospital, with the highest number in Jombang Hospital by 6 mothers (4.5%). BV can increase the risk of premature 7 times, especially if it is found at <16 weeks of pregnancy (Robinson and Norwitz, 2017).

CONCLUSIONS

There were significant disparities in maternal sociodemographic characteristics with preterm birth among hospitals. Sixteen variables of sociodemographic characteristics were identified: gestational age, maternal age, smoking, EPDS, fetus less moving, number of visits during pregnancy, premature history, history of disease, a history of abortion, height, BMI, MUAC, periodontal infection, bleeding in young/old pregnancy, anemia and BV status. Our findings can be used as the basic data for future research in an effort to prevent premature birth disorders based on maternal sociodemographic characteristic.

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AUTHOR CONTRIBUTIONS

SH contributed to data analysis, drafted the manuscript; SH, BS, HTD contributed to conception, design, and data analysis, critically revised the manuscript. All authors gave final approval and agreed to be accountable for all aspects of the project.

CONFLICT OF INTERESTS

The authors had no conflict of interests regarding with respect to the authorship and/or publication of this paper.

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