

## DETERMINANTS OF MOTHERS AND COMPONENTS OF ANTENATAL CARE SERVICES WITH FETAL OUTCOME IN INDONESIA (ANALYSIS OF SECONDARY DATA OF RISKESDAS 2018)

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### ABSTRAK : DETERMINAN IBU DAN KOMPONEN PELAYANAN ANTENATAL CARE (10T) DENGAN FETAL OUTCOME DI INDONESIA (ANALISA DATA SEKUNDER RISKESDAS 2018)

Latar Belakang: Antenatal care (ANC) merupakan perawatan yang diberikan oleh tenaga kesehatan yang terampil kepada ibu hamil untuk memastikan kesehatan bagi ibu dan janin selama kehamilan. Tujuan ANC adalah mengurangi morbiditas dan mortalitas ibu dan janin baik secara langsung melalui deteksi dan pengobatan komplikasi terkait kehamilan dan tidak langsung melalui peningkatan risiko komplikasi selama persalinan sehingga mendapatkan rujukan yang tepat. ANC bertujuan juga untuk memantau kemajuan proses kehamilan dan memastikan kesehatan pada ibu serta tumbuh kembang janin. Output/luaran janin dapat dilihat dari berat badan lahir bayi yang dilahirkan.

Tujuan: untuk mengetahui hubungan determinan karakteristik ibu dan komponen pelayanan *antenatal care* (10 T) dengan *fetal outcome* di Indonesia.

Metode: Penelitian ini menganalisis data sekunder hasil Riskesdas 2018. Desain penelitian yang digunakan pada Riskesdas 2018 adalah studi potong lintang (*cross sectional*). Sampel dalam penelitian ini adalah seluruh sampel Riskesdas 2018 yang berjumlah 38.476 sampel. Kriteria inklusi pada penelitian ini adalah data terdokumentasi yang tidak tersedia lengkap sesuai dengan variabel penelitian. Pengumpulan data dilakukan dengan cara mengajukan permintaan raw data hasil Riskesdas 2018 pada Laboratorium Manajemen data Badan Litbang Kesehatan. Teknik analisis data univariat disajikan dalam bentuk tabel distribusi frekuensi. Analisis bivariat menggunakan *Chi Square* untuk mengetahui hubungan determinan karakteristik ibu dan komponen pelayanan *antenatal care* (10T) dengan *Fetal Outcome*.

Hasil: Terdapat hubungan antara umur ibu, pendidikan dan pekerjaan dengan fetal outcome ( $p$  value= 0,01). Terdapat hubungan antara pengukuran tinggi badan ( $p = 0,000$ ), pengukuran berat badan ( $p = 0,021$ ), pengukuran lila ( $p=0,01$ ), pengukuran TFU ( $p = 0,003$ ), pemeriksaan leopold ( $p=0,02$ ), pengukuran DJJ ( $p=0,000$ ), pemberian imunisasi TT ( $p=0,002$ ), pemberian Tablet tambah darah ( $p = 0,000$ ) dan pemeriksaan laboratorium ( $p=0,000$ ) dengan fetal outcome di Indonesia. Komponen pelayanan ANC yang tidak berhubungan dengan fetal outcome adalah pengukuran tekanan darah ( $p=0,122$ ) dan pelaksanaan temu wicara/konseling ( $p=0,872$ ).

Kesimpulan: Terdapat hubungan antara umur, pendidikan dan pekerjaan, pengukuran tinggi badan, berat badan, pengukuran LILA, pengukuran TFU, pengukuran leopold, pengukuran DJJ, imunisasi TT, pemberian tablet tambah darah dan pemeriksaan laboratorium dengan *fetal outcome*.

Saran: Ibu hamil agar pemeriksaan kehamilan di fasilitas kesehatan minimal 6 kali kunjungan untuk mendapatkan pemeriksaan kehamilan yang berkualitas.

Kata Kunci : ANC, Determinan Ibu, Fetal outcome

### ABSTRACT

Background: Antenatal care (ANC) is treatment provided by professional health workers to pregnant women to ensure the health of the mother and fetus during pregnancy. The aim of ANC is to reduce maternal and fetal morbidity and mortality both directly through the detection and treatment of pregnancy-related complications and indirectly through increasing the risk of complications during delivery so as to obtain appropriate referrals. ANC also aims to monitor the progress of the pregnancy process and ensure the health of the mother and the growth and development of the fetus. Fetal output can be seen from the birth weight of the baby being born.

Purpose: This study aims to determine the relationship between determinants of maternal characteristics and components of antenatal care services (10 T) with fetal outcome in Indonesia.

Results: There is a relationship between maternal age, education and occupation with fetal outcome ( $p$  value = 0.01). There is a relationship between height measurement ( $p= 0.000$ ), weight measurement ( $p= 0.021$ ), lilac measurement ( $p= 0.01$ ), TFU measurement ( $p= 0.003$ ), Leopold's examination ( $p= 0.02$ ), measurement of FHR ( $p= 0.000$ ), TT immunization ( $p = 0.002$ ), administration of blood-added tablets ( $p = 0.000$ ) and laboratory examination ( $p= 0.000$ ) with fetal outcome in Indonesia. Components of ANC services that were not related to fetal outcome were blood pressure measurement ( $p= 0.122$ ) and conduct of speech/counseling meetings ( $p= 0.872$ ).

Conclusion: There is a relationship between age, education and occupation measurement of height, weight, Circumference measurement, Fundal Height measurement, Leopold's maneuvers, FHR measurement, TT immunization, administration of blood-added tablets and laboratory examination with fetal outcome.

Suggestion: Pregnant women are required to have a pregnancy check-up at a health facility at least 6 times to get a quality pregnancy check-up.

Keywords: ANC, Determinants of Mother, Fetal Outcome

## INTRODUCTION

Antenatal care (ANC) is treatment provided by professional health workers to pregnant women to ensure the health of the mother and fetus during pregnancy. The aim of ANC is to reduce maternal and fetal morbidity and mortality both directly through the detection and treatment of pregnancy-related complications and indirectly through increasing the risk of complications during delivery so as to obtain appropriate referrals. ANC also aims to monitor the progress of the pregnancy process and ensure the health of the mother and the growth and development of the fetus (Hofmeyr & Hodnett, 2013). Fetal output can be seen from the birth weight of the baby being born (Schonborn et al., 2022). Maternal mortality rate (MMR) is an indicator to assess the success of maternal health programs and the degree of public health. In general, there was a decrease in maternal mortality during the period 1991-2015 from 390 to 305 per 100,000 live births (Kemenkes RI, 2019). Although there is a tendency to decrease maternal mortality, the MDGs target that must be achieved is 102 per 100,000 live births in 2015. The direct causes of MMR are bleeding, preeclampsia/eclampsia, and infection. In addition, comorbidities during pregnancy can cause poor pregnancy conditions. The comorbidities are heart diseases, malaria, tuberculosis, kidney diseases, and acquired immunodeficiency syndrome. In addition to direct causes, MMR is also caused by access to health services, demography, sociocultural, low public awareness, educational background, family socioeconomic point, community and political environment (Susiana, 2019); (Wijayanti et al., 2020).

One of the efforts to reduce MMR is antenatal care (ANC). ANC is the care provided by health professionals to pregnant women to ensure the health of the mother and fetus during pregnancy. The aim of ANC is to reduce maternal and fetal morbidity

and mortality both directly through the detection and treatment of pregnancy-related complications and indirectly through increasing the risk of complications during delivery so as to obtain appropriate referrals (WHO, 2016). The ANC component consists of measuring height, weighing weight, measuring blood pressure, measuring fetal heart rate, measuring fundal/uterine height, determining fetal position, measuring upper arm circumference, administering tetanus toxoid immunization, giving extra tablets, providing counseling and action (Badan Penelitian dan Pengembangan Kesehatan, 2019); (Sinaga, 2019). ANC aims to monitor the progress of the pregnancy process and ensure the health of the mother and the growth and development of the fetus. Fetal output can be seen from the birth weight of the baby being born (Al-Ateeq & Al-Rusaies, 2015).

The purpose of this study was to determine the relationship between determinants of maternal characteristics and components of antenatal care with fetal outcome in Indonesia.

## RESEARCH METHODS

This study analyzes secondary data from basic health research/Riset Kesehatan Dasar (Riskesdas) 2018. The research design used in basic health research 2018 is a cross-sectional study. This research is descriptive analytic by using a cross sectional design with a quantitative approach. Data were taken from 34 provinces in Indonesia. The sample in this study was the entire sample of Basic Health Research 2018. The sample of maternal characteristics consisted of mothers aged 10 - 54 years who had been married and gave birth to live in the last 5 (five) years prior to the survey, education, occupation and place of residence. Samples of maternal characteristics amounted to 38,476 samples. Inclusion criteria for fetal outcome were information on weight at birth obtained from records held by respondents. The exclusion criteria in this

study were documented data that were not fully available according to the research variables.

The data collection technique was by analyzing secondary data from basic health research 2018. Data collection was done by submitting a request for raw data from basic health research 2018 at the data management laboratory of the health research and development agency. Data analysis technique using univariate and bivariate analysis. In Univariate analysis, the data obtained from the results of data collection is presented in the form of a frequency distribution table. While in bivariate analysis used chi square to determine the relationship between determinants of maternal characteristics and components of antenatal care

with Fetal Outcome. The research hypothesis was that there was a relationship between the determinants of maternal characteristics and components of antenatal care services with fetal outcome in Indonesia. Ho:  $p \leq 0$  and H1:  $\geq p 0$ .

## RESEARCH RESULT

### Univariate analysis

#### Frequency Distribution Mothers Determinant

Based on table 1.1 shows that 66.8% of respondents, most of them are in normal reproductive age, namely age 20-35 years. Most of the respondents had a SLTP/MTS education, namely 24.1% and most of the respondents did not work, namely 57%.

**Table 1**  
**Table 1.1 Descriptive Analysis of Frequency Distribution Mothers Determinant**

	Mothers Determinant	Total	%
Age	High Risk (< 20 years old)	1685	4,4
	Normal (20 – 35 years old)	25.700	66,8
	High Risk (> 35 years old)	11.091	28.8
Education Level	Uneducated	521	1,4
	Elementary School D.O	2.246	5,8
	Elementary School Graduates	7.441	19.3
	Junior High School Graduates (SLTP/MTs)	9.280	24,1
Occupation	Associate Degree	2.242	5,8
	Bachelor/Master	3.498	9,1
	Unemployed	21.946	57,0
	Students	233	0,6
	Civil Servant/Military Officer/Police/State-owned employee	1.492	3.9
	Private employee	2.857	7.4
	Entrepreneur	3.565	9.3
	Farmer	3.503	9.1
	Fisherman	52	0.1
	Laborer/Driver/Housekeeper	1.084	2.8
Others	3.744	9.7	

Frequency Distribution of ANC Service Components

**Table 2**  
**Descriptive Analysis of Frequency Distribution of Antenatal Care Service Components**

	ANC Service Components	Total	%
Height Measurement	Yes	28.528	74,1
	No	9.948	25.9
Weight Measurement	Yes	37.752	98,1
	No	724	1,9
Blood Pressure Measurement	Yes	38.069	98,9
	No	407	1,1
Upper Arm Circumference Measurement	Yes	32.970	85,7
	No	5.506	14,3

Uterine Fundal Height Measurement	Yes	35.407	92,0
	No	3.069	8,0
Determination of Fetal Location (Leopold)	Yes	37.101	96,4
	No	1.375	3,6
DJJ Calculation	Yes	37.272	96,9
	No	1.204	3,1
Interview	Counseling	27.450	71,3
	Treatment	1.248	3,2
	Counseling & Treatment	8.567	22,3
	No	1.211	3,1
TT Immunization	Yes	28.545	74,2
	No	6.873	17,9
	Declared by health workers no need TT	3.058	7,9
Getting TTD	Yes	35.607	92,5
	No	2.869	7,5
Laboratory examination	Yes	14.479	37,6
	No	22.412	58,2
	Don't Know	1.585	4,1

Based on table 1.2 shows that 74.1% of respondents get a height measurement. 98.1% received a weight measurement. 98.9% received a blood pressure measurement. 85.7% got the upper arm circumference measurement. 92% got a TFU measurement. 96.4% received Leopold's examination. 96.9 received FHR examination. 71.3% received counseling during case management.

74.2% stated that they had received TT immunization. 92.5% received blood-added tablets and 58.2% did not get laboratory tests

**Bivariate Analysis**

Relationship Between Maternal Determinants and Components of Antenatal Care Services with Fetal Outcome in Indonesia

**Table 3**  
**Relationship Between Maternal Determinants and Components of Antenatal Care Services with Fetal Outcome in Indonesia**

Mothers Determinant		Fetal Outcome										P-VALUE
		BBLSR		BBLR		Normal		Makrosomia		Total		
		N	%	N	%	N	%	N	%	N	%	
Age	High Risk (< 20 y.o)	7	0,01	147	0,38	1.519	3,95	12	0,03	1.685	4,37	0,001
	Normal (20 – 35 y.o)	34	0,09	1.413	3,67	23.691	61,6	562	1,5	25.700	66,86	
	High Risk (> 35 y.o)	33	0,08	655	1,7	10.087	26,2	316	0,82	11.091	28,77	
Education Level	Uneducated	2	0,001	45	0,12	467	1,21	7	0,02	521	1,35	0,001
	Elementary School D.O.	1	0,00	169	0,44	2.033	5,28	43	0,11	2.246	5,84	
	Elementary School Graduate	20	0,05	471	1,22	6.770	17,60	180	0,47	7.441	19,34	
Occupation	Junior High School Graduate	11	0,03	538	1,40	8.526	22,16	205	0,53	9.280	24,12	0,001
	High School Graduate	26	0,07	722	1,88	12.186	31,67	314	0,82	13.248	34,43	
	Associate Degree	8	0,02	98	0,25	2.074	5,39	62	0,16	2.242	5,83	
Occupation	Bachelor/Master	6	0,02	172	0,45	3.240	8,42	79	0,21	3.497	9,09	0,001
	Unemployed	47	0,12	1.316	3,42	20.098	52,2	485	1,26	21.946	57,04	
	Students	2	0,01	19	0,05	205	0,5	6	0,02	233	0,60	
	Civil Servant/Military Officer/Police/State-owned employee	2	0,01	70	0,18	1.384	3,6	36	0,09	1.492	3,88	
	Private employee	7	0,02	160	0,42	2.631	6,8	59	0,15	2.857	7,43	
	Entrepreneur	3	0,01	160	0,42	3.296	8,6	106	0,28	3.565	9,27	
	Farmer	4	0,01	218	0,57	3.191	8,3	90	0,23	3.503	9,10	
	Fisherman	0	0,00	3	0,01	49	0,1	0	0,00	52	0,14	
	Laborer/Driver	0	0,00	64	0,17	1.008	2,6	12	0,03	1.084	2,82	
	Others	9	0,02	205	0,53	3.434	8,9	96	0,25	3.744	9,73	

Components of Antenatal Care Services with Fetal Outcomes in Indonesia

Mother's Determinant		Fetal Outcome										P-VALUE
		BBLSR		BBLR		Normal		Makrosomia		Total		
		N	%	N	%	N	%	N	%	N	%	
Height Measurement	Yes	58	0,15	1.651	4,29	26.216	68,14	603	1,57	28.528	74,14	0,000
	No	16	0,04	564	1,47	9.081	23,60	287	0,75	9.948	25,86	
Weight Measurement	Yes	72	0,19	2.172	5,65	34.647	90,76	875	2,27	37.752	98,12	0,021
	No	2	0,00	43	0,11	650	0,97	15	0,04	724	1,88	
Blood Pressure Measurement	Yes	73	0,19	2.199	5,72	34.922	90,76	875	2,27	38.069	98,94	0,122
	No	1	0,00	16	0,04	375	0,97	15	0,04	407	1,06	
Upper Arm Circumference Measurement	Yes	63	0,16	1.920	4,99	30.265	78,66	722	1,88	32.970	85,69	0,001
	No	11	0,03	295	0,77	5.032	13,08	168	0,44	5.506	14,31	
Uterine Fundal Height Measurement	Yes	68	0,18	2.037	5,29	32.513	84,50	789	2,05	35.407	92,02	0,003
	No	6	0,02	178	0,46	2.784	7,24	101	0,26	3.069	7,98	
Determination of Fetal Location (Leopold)	Yes	70	0,18	2.135	5,55	34.058	88,52	838	2,18	37.101	96,43	0,002
	No	4	0,01	80	0,21	1.239	3,22	52	0,14	1.375	3,57	
DJJ Calculation	Yes	73	0,19	2.149	5,96	34.212	88,92	838	2,18	37.272	96,87	0,000
	No	1	0,00	66	11,72	1.085	2,82	52	0,14	1.204	1,204	
Interview	Counseling	51	0,13	1.570	4,08	25.184	65,45	645	1,68	27.450	71,34	0,872
	Treatment	4	0,01	77	0,20	1.139	2,96	28	0,07	1.248	3,24	
	Counseling & Treatment	16	0,04	507	1,32	7.858	20,42	186	0,48	8.567	22,27	
TT Immunization	No	3	0,01	61	0,16	1.116	2,90	31	0,08	1.211	3,15	0,002
	Yes	45	0,12	1.645	4,28	26.219	68,14	636	1,65	28.545	74,19	
	Declared by health workers no need TT	4	0,01	155	0,40	2.827	7,35	72	0,19	3.058	7,95	
Getting Fe	Yes	61	0,16	2.044	5,31	32.702	84,99	800	2,08	35.607	92,54	0,000
	No	13	0,03	171	0,44	2.595	6,74	90	0,23	2.869	7,46	
Laboratory examination	Yes	30	0,08	885	2,30	13.296	34,56	268	0,70	14.479	37,63	0,000
	No	39	0,10	1.227	3,19	20.553	53,42	593	1,54	22.412	58,25	
	Don't Know	5	0,01	103	0,27	1.448	3,76	29	0,08	1.585	4,12	

DISCUSSION

Based on Table 1.3, it can be seen that the normal pregnancy output (baby weight 2500-4000 grams) in mothers aged 20-35 years is 23,691 (61.6%). The p value of 0.001 indicates that there is a relationship between reproductive age and the resulting pregnancy output. Several research results show that there is a correlation between maternal age during pregnancy and the pregnancy output. Based on Syntha Ida & Amin (2021), it shows that there is a connection between teenage pregnant women (15-19 years) and the incidence of low birth weight babies (LBW). The cause of LBW is influenced by maternal and fetal factors. Maternal factors include low pre-pregnancy weight, inadequate weight gain during pregnancy, malnutrition, history of pregnancy with low birth weight, adolescents with short stature (stunting), frequent pregnancies and a history of anemia. This is in line with the results of research by Pinontoan & Tombokan (2015), which explains that there is a relationship between the age at risk of pregnant women (< 20 years or > 35 years) with the incidence of LBW. LBW is a baby with a birth weight of less than 2500 grams. The results of other studies show that there is a significant relationship between pregnant women at risky age with the incidence of LBW (p

value: 0.003) and pregnant women at risk age have a 4,290 times greater chance of developing LBW compared to those who are not at risk (Khoiriah, 2017). The results of this study are in line with the results of research conducted by Jayanti et al., (2017), 67.4% of the group of pregnant women at risk of giving birth to babies with LBW. Maternal age is closely related to the baby's birth weight. Pregnancy under the age of 20 is pregnancy high risk, and women are still in their infancy and therefore have a relatively small pelvis, which increases the risk. Pregnancy over the age of 35 has health problems such as high blood pressure and diabetes, anemia and other chronic diseases. Later in pregnancy > 4 children/birth spacing of less than 2 years can affect LBW babies due to malnutrition and delayed growth and development. Mothers between 15 and 19 years old have the potential to be at risk of anemia and are at risk of having a fetus with stunted growth. At a young age, the development of reproductive organs and physiological functions is not optimal yet. In addition, their emotions and souls are immature, so the mothers cannot respond to optimal intake during pregnancy and complications often occur. The younger the pregnant woman, the more likely she will give birth to low birth weight (Cunningham et al., 2013).

Based on the education level of the respondents, it showed that 12,186 (31.7%) were normal pregnancies in mothers with high school education. *p*-value 0.001 indicates that there is a relationship between education level and pregnancy outcomes. The results of this study are consistent with the results reported by Pompey et al. (2009); Auliana et al (2016), mothers with low education have a lower average birth weight of babies than mothers with higher education, in this case education has a tremendous impact. Mother's knowledge about pregnancy, childbirth, and postpartum care. A person's level of education supports and provides opportunities for the desire and motivation to know everything related to the absorption of knowledge and pregnancy. Based on the respondent's occupation, it shows that most of the mothers do not work, namely 21,946 (57.04%). *P*-value 0.01 indicates that there is a relationship between work and the resulting pregnancy output. Work that requires vigorous exercise consumes a lot of energy and reduces the calories available to the fetus, but most of the energy needed is met by the work done by the mother. The lack of energy needs of hardworking pregnant women is one of the factors that can affect the birth weight of babies born later. For fluctuating socioeconomic status, there is a difference in the mean birth weight of infants in the group of mothers with low socioeconomic status, and the mean birth weight is the average birth weight of infants in the group with high socioeconomic status which is higher than BB. However, these results contradict the theory that low socioeconomic status can interfere with the fulfillment of nutritional needs during pregnancy so that it affects the birth weight of newborns.

Antenatal care (ANC) examination is a pregnancy examination that aims to improve the physical and psychological health of pregnant women optimally, so that mothers are able to go through the process of pregnancy, childbirth, postpartum, breastfeeding in a healthy and safe manner (Kementrian Kesehatan, 2020). In addition, antenatal care aims for all pregnant women to obtain comprehensive and quality antenatal care so that pregnant women can pass the process of pregnancy and childbirth with positive experiences and can give birth to healthy and quality babies. Positive experiences can provide added value that is beneficial for pregnant women in carrying out their roles as women, wives and mothers (Kementrian Kesehatan, 2020). Visits of pregnant women at least 6 times to health workers who have clinical/midwifery competence. The minimum integrated antenatal care standard is 10 T service which consists of (1)

measuring height and weighing. (2) Measure blood pressure. (3) Assessing nutritional status by measuring upper arm circumference (LILA). (4) Measuring the height of the uterine fundus (TFU). (5) Determine fetal presentation and fetal heart rate (FHR). (6) Screening the status of tetanus immunization and giving tetanus diphtheria (DT) immunization if necessary. (7) Give blood-added tablets of at least 90 tablets during pregnancy. (8) Examination of laboratory tests. (9) Case management/handling in accordance with the authority and (10) Dialogue/counseling (Kementrian Kesehatan, 2020).

Table 3.4 analyzes the components of ANC services with output/fetal outcome. Respondents whose height was measured were 28,528 (74.14%). Respondents who were measured with the output of VLBW and LBW were 4.29%. And 0.15%. *P* value for height was measured is 0.000. This means that there is a relationship between height measurements and the resulting output/fetal outcome. This is in line with the results of previous studies which explained that mothers with a height <145 cm were a significant predictor for giving birth to LBW babies (Mumbare et al., 2012). Respondents who measured body weight (BW) were 37,752 (98.12%). Respondents who measured BW with the output of VLBW and LBW were 5.65% and 0.19%, respectively. *P* value for BW measurement is 0.021. This means that there is a relationship between the measurement of BB with the resulting output/fetal outcome. This is in line with the results of research by Kurdanti et al., (2020), which explains that the body mass index (BMI) has the greatest AUC value for babies' birth weight, which is 0.519. BMI in question is prepregnancy. Pre-pregnancy BMI can be used as a parameter to predict the baby's birth weight. This is in line with previous studies which explained that mothers with normal weight gain or according to BMI mostly gave birth to babies with normal weight. The nutritional status of pregnant women can affect the growth and development of the fetus. The weight gain of pregnant women must be in accordance with the increase in gestational age (Susilojati & Handayani, 2013).

Respondents whose blood pressure (BP) was measured were 38,069 (98.94%). Respondents who measured BP with the output of VLBW and LBW were 5.72% and 0.19%, respectively. *P* value for BP measurement is 0.122. This means that there is no relationship between BP measurement and the resulting output/fetal outcome.

Respondents who measured the upper arm circumference (LILA) were 32,970 (85.69%). Respondents measured by LILA with outputs of VLBW

and LBW are 4.99% and 0.16%, respectively. P value for LILA measurement is 0.001. This means that there is a relationship between the measurement of LILA and the resulting output/fetal outcome. LILA is used to assess the nutritional status of pregnant women. LILA normal pregnant women > 23.5 cm (Kemenkes RI, 2013). LILA is also used to determine the nutritional status of pregnant women. whether pregnant women are chronically deficient in energy (KEK) (Apriliani et al., 2022). This is in accordance with previous research which explains that there is a relationship between SEZ pregnant women and the incidence of LBW (Fatimah & Yuliani, 2019); (Vitriani et al., 2018). Mothers with KEK experience a lack of energy for a very long time even before becoming pregnant. SEZ is characterized by the size of the upper arm circumference < 23.5 cm. Insufficient nutritional intake leads to poor implantation of the products of conception. The size of the placenta becomes smaller so that it can affect the transfer of oxygen and nutrients to the fetus is reduced. This can lead to LBW. The results of other studies also support those pregnant women with CED as a risk factor for the incidence of LBW ( $p = 0.004$ ) with a value of) R indicate that pregnant women with SEZ have a 7 times greater risk of giving birth to babies with LBW compared to mothers who do not experience CED (Haryanti et al., 2019).

Respondents who measured uterine fundal height (UFH) were 35,407 (92.02%). Respondents who were measured by the UFH with the output of VLBW and LBW were 5.29% and 0.18%, respectively. P value for UFH measurement is 0.003. This means that there is a relationship between the UFH measurement and the resulting output/fetal outcome. this is in line with research conducted by Aghadiati(2019), which explains that there is a significant relationship between UFH and birth weight ( $p < 0.001$ ). Measurement of UFH aims to provide information on gestational age and to measure the interpretation of fetal weight. Interpretation of fetal weight to determine if there is fetal growth retardation (Cunningham et al., 2012).

Respondents whose measurements were taken to determine the position of the fetus were 37,101 (96.43%). Respondents who examined the location of the fetus with the output of VLBW and LBW were 5.55% and 0.18%, respectively. The P value for determining fetal position is 0.002. This means that there is a relationship between the determination/examination of the position of the fetus with the resulting output/fetal outcome. Leopold examination is a tactile examination that aims to determine the position / location of the fetus.

Respondents who measured fetal heart rate (FHR) were 37,272 (96.87%). Respondents examined by DJJ with the output of VLBW and LBW are 5.96% and 0.19%, respectively. P value for FHR measurement is 0.000. This means that there is a relationship between the determination/examination of FHR with the fetal outcome. The purpose of the FHR examination is to determine the well-being of the fetus, to help detect changes in the FHR pattern. An FHR pattern that is too fast or slow indicates that there is a problem with the fetus such as a lack of intrauterine oxygen.

All respondents were given a talk meeting which included counseling and action (100%). P value for the talk show is 0.872. This means that there is no relationship between the interview and the resulting output/fetal outcome. The benefits of conducting a dialogue meeting are to provide information that needs to be conveyed to pregnant women, namely the results of the examinations that have been carried out, treatment according to gestational age and maternal age, nutrition of pregnant women, psychological and mental readiness, danger signs during pregnancy, childbirth and postpartum, preparation for childbirth , postpartum contraception, newborn care, early initiation of breastfeeding (IMD) and exclusive breastfeeding (Kementrian Kesehatan, 2020).

Respondents who did not receive TT immunization were 6,873 (17.86%). P value for TT immunization is 0.002. This means that there is a relationship between the administration of TT immunization with the resulting output/fetal outcome.

Respondents who received blood-added tablets (TTD) were 35,607 (92.54%). P value for giving TTD is 0.000. This means that there is a relationship between the administration of TTD and the resulting output/fetal outcome. The benefit of giving TTD during pregnancy is to prevent iron deficiency in pregnant women (Saleh, 2021); (Rustiawan & Pratiwi, 2022). Anemia in pregnant women contributes to the incidence of LBW. Causes of anemia, mostly due to iron deficiency. Based on the results of research conducted by Novianti & Aisyah (2018), it shows that there is a relationship between anemia and the incidence of LBW at SMC Hospital, Tasikmalaya Regency ( $p = 0.011$ ). Anemia in pregnancy can result in disruption of the oxygenation process and the supply of nutrients from the mother to the fetus. This will result in impaired weight gain resulting in LBW. This is supported by the results of research by Aulia et al., (2019), which showed that there was a significant relationship between anemic pregnant women and the incidence of LBW ( $p$  value = 0.000) and pregnant women with

anemia had 10 times the chance of giving birth to babies with LBW (OR). = 9.917).

Respondents who performed laboratory examinations at the time of ANC examination were 14,479 (37.63%). P value for laboratory examination is 0.000. This means that there is a relationship between laboratory examinations and the resulting output/fetal outcome. The laboratory tests given are pregnancy tests, blood hemoglobin levels, blood types, triple elimination tests (HIV, syphilis and hepatitis B) and malaria in malaria endemic areas (Kementrian Kesehatan, 2020). Examination of blood hemoglobin levels aims to determine the level of red blood cells in pregnant women. Normal pregnant women with Hb > 11 g%. It is recommended to check Hb at least 2 times, namely in the first and third trimesters. As reviewed in the results of previous studies that mothers with anemia are associated with the incidence of LBW and have the opportunity to give birth to LBW.

Pregnant women in malaria endemic areas are recommended to carry out laboratory examinations for malaria. Malaria can increase morbidity and mortality in pregnant women, fetuses and infants. The results of a study conducted by Anggara, (2021), showed that malaria infection had a 1.77 times risk of increasing preterm labor and low birth weight.

## CONCLUSION

The determinants of mothers were found to be mostly in normal reproductive age, especially in age 20-35 years old, most of the respondents were educated in junior high school/MTs and most of the respondents do not work. There is a relationship between maternal determinants and fetal outcome and there is a relationship between the components of ANC services (measurement of height, weight, LILA measurement, TFU measurement, Leopold measurement, FHR measurement, TT immunization, giving blood tablets and laboratory tests) with fetal outcomes.

## SUGGESTION

Pregnant women should carry out quality pregnancy checks through integrated antenatal care and at least make 6 visits during pregnancy in health facilities by health workers who have competence.

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