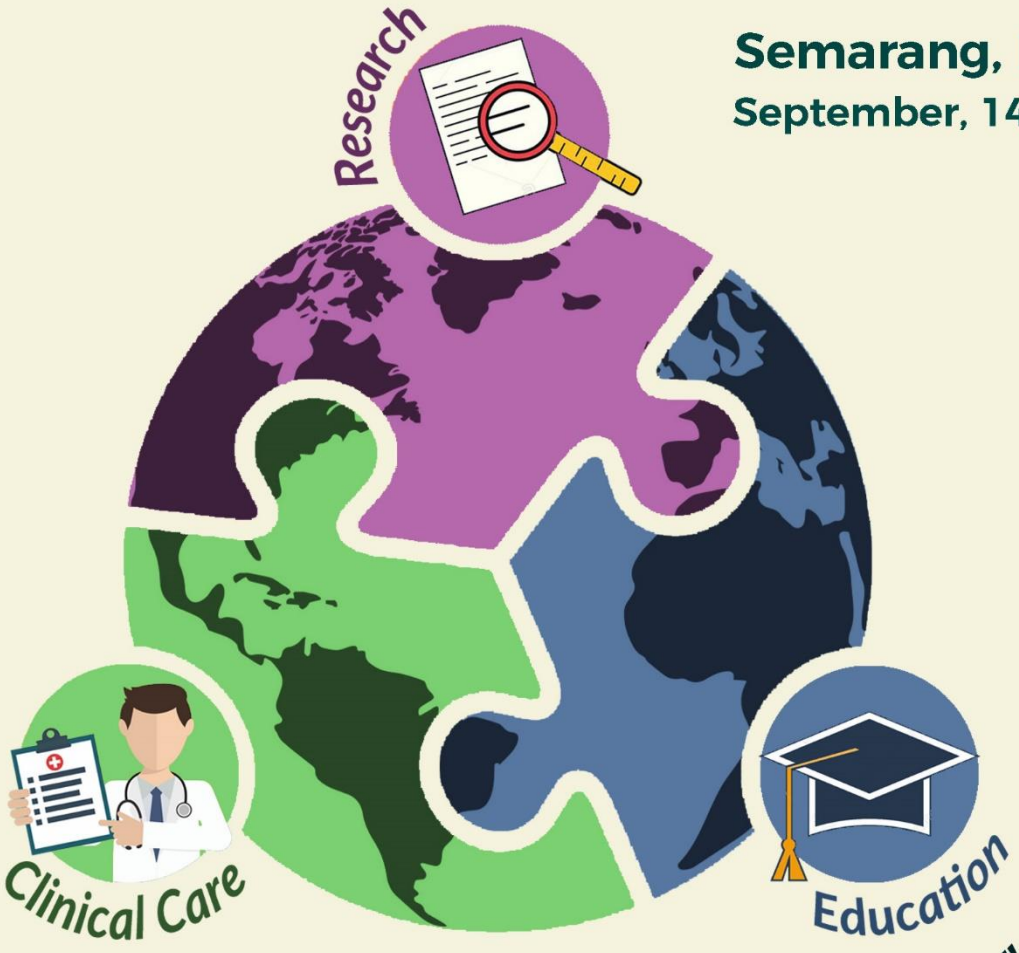
PROCEEDING

2ND INTERNATIONAL CONFERENCE ON TRANSLATIONAL MEDICINE AND HEALTH SCIENCES (ICTMHS)

in conjunction with

4TH JAVA INTERNATIONAL NURSING CONFERENCE (JINC)



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"Creating a Better Future of Health Care: Partnerships in Research, Education, and Clinical Care"

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"Creating A Better Future of Health Care: Partnership in Research, Education and Clinical Care"

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"Creating Better Future Health Care: Partnership in Research, Education and Clinical Care"

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Preface

Collaboration or partnership is a term which is often used in the fields of research, clinical practice and health professional education. Collaboration occurs when two or more people work together to achieve common goals and shared outcomes. Collaboration includes a commitment to reciprocal relationships to achieve certain goals and is developed in conjunction with mutually supportive resources. Research, education and clinical practice are interrelated; research informs education, which in turn will affect the provision of care to patients.

In the area of health, it is believed that collaboration leads to better health services and improves patient satisfaction. Science is the foundation for providing quality service to patients and research is one of the means of doing so. The complexity of patient problems nowadays requires inter-professional collaborations among the health professions since the problems may not be solved when a profession is working alone. Collaboration in research occurs when researchers from more than one profession or disciplines work together to achieve common goals in generating new scientific findings.

Collaboration in the health services occurs when two or more people from multidisciplinary areas work together to solve the problems of the patients comprehensively. This collaboration may occur when each individual mutually respects and contributes according to his/her position to create a conducive environment to optimize the patient's health. WHO states that the health workers who perform collaborations in caring for patients will gain more success in resolving complex patient problems. Collaborations in health services are useful for improving the skills to provide comprehensive care, developing innovations and creativity, and focusing more on patient-centered care.

Collaboration in education or known as inter-professional education (IPE) occurs when two or more students from multidisciplinary studies learn together on a particular topic and jointly solve the case. Collaborations in education does not only occur in the university contexts but also in the clinical practice areas. These collaborations are closely related. IPE is part of the professional practice before the health workers implement it in the healthcare services.

The international conference which focuses on "Creating a Better Future of Healthcare: Partnership in Research, Education, and Clinical Care" is a way to create successful collaborations among the health workers. The conference also aims to introduce the public that the Faculty of Medicine Diponegoro University is committed to creating harmonious collaboration between health workers, including doctors, nurses, nutritionists, pharmacists, and dentists.

Organizing Committee

2nd INTERNATIONAL CONFERENCE OF TRANSLATIONAL MEDICINE AND HEALTH SCIENCES *in conjunction with* 4th JAVA INTERNATIONAL NURSING CONFERENCE 2018

"Creating Better Future Health Care: Partnership in Research, Education and Clinical Care"

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Welcome message

First of all, thanks to **Almighty Allah**, the most merciful, beneficent and compassionate, for His blessing that this conference could be held today.

I would like to express my greatest gratitude to Prof. Dr. Yos Johan Utama, S.H., M.Hum; Rector of Diponegoro University, Prof. Dr. dr. Tri Nur Kristina, DMM., M.Kes.; Dean of Faculty of Medicine Diponegoro University, Prof. Dr.rer.nat Heru Susanto, S.T., M.M., M.T.; Director of LPPM, dr. Ahmad Zulfa, Sp.And., Ph.D, vice dean of research and innovation Faculty of Medicine for all of their kind supervision during the preparation of this event. I would like to express my sincere gratitude to all of the committee members for all of your hard work, kind help, and best effort as a solid team work, by which this event can be held successfully today. I would like to thank all of the honorable speakers for your willingness to come and give lectures here, and all of participants from various institutions in the world. Welcome to **2nd International Conference on Translational Medicine and Health Sciences (ICTMHS) in conjunction with 4th Java International Nuraing Conference 2018.** It is a great pleasure to have all of you here in Semarang Indonesia, on this September 14-15, 2018.

ICTMHS is an annual routine program that began in 2017 initiated by the faculty to support the university's vision of becoming a world class university. Nursing, a part of the faculty of medicine, has previously held international nursing conferences since 2010. This time we are together to support UNDIP as a research university by organising this event. The theme of this conference is "Creating a Better Future of Healthcare: Partnership in Research, Education and Clinical Care". The focuses of this conference are Interprofessional Education and Research, Collaborative Practice, Translational Medicine, and Nutrition, Dietetic and Food. This is an interesting theme that invites all health workers to unite to increase collaboration in various aspects to produce quality services. Through this conference, we hope to contribute in introducing and educating the scientific community on the nowadays advance in medical and health sciences. As a major goal of this event, we hope that it can be an excellent chance to discuss interesting ideas and develop fruitful project in the future, network opportunities with old and new colleagues, coordination new partnerships which advance collaboration either about the research field or not, as well as the careers of all participants.

Please enjoy your participation in ICTMHS-JINC 2018 and have a great experience during your stay in Semarang.

Wish you the best in all your work.

Ns. Reni Sulung Utami, S. Kep., M.Sc

Organizing Chairperson

Welcome message

Praise to the God Almighty for the International Conference on Translational Medicine and Health Science (ICTMHS) in conjunction with Java International Nursing Conference (JINC) 2018, Faculty of Medicine Diponegoro University and I are very excited for this event and we welcome to all of the participants and speakers to this event.

The special acknowledgement, I address to the distinguished speakers dr. Bambang Wibowo,Sp.OG(K), MARS from Ministry of Health Republic of Indonesia, dr. Soetedjo, Sp.S(K) from The Indonesian Medical Association, Prof. Sandra Capra, PhD,FDAA from The University of Queensland-Australia, Prof. Dr.dr Kristina,DMM.,M.Kes from Diponegoro University-Indonesia, Prof. Dra. Setyawati,M.App.Sc.,Ph.D from Faculty of Nursing University of Indonesia, Fiona Miller from Griffith University-Australia, Lybrich Kramer from Hanze University-The Netherland, Anne Hyre from Jhon Hopkins University-United States of America, Kjara Bernadette V. Agatep from St. Paul University-Philippines, Dr. dr. Mexitalia Setiawati, Sp. A(K) from Diponegoro University-Indonesia, dr.JC. Susanto,Sp.A (K) from Diponegoro University-Indonesia

I am very grateful for your willingness to attend and share your knowledge to us. Faculty of Medicine Diponegoro University has a vision to be the centre for medical and health sciences. ICTMHS is an annual routine program that began in 2017 initiated by the faculty to support the university's vision of becoming a world class university. Nursing, a part of the faculty of medicine, has previously held international nursing conferences since 2010. This time we are together to support UNDIP as a research university by organising this event. The theme of this conference is "Creating a Better Future of Healthcare: Partnership in Research, Education and Clinical Care". This is an interesting theme that invites all health workers to unite to increase collaboration in various aspects to produce quality services.

I hope, from this event we will increase the number of Faculty of Medicine and Diponegoro University's international publications as well as promoting international collaboration. I wish that this event will give a big contribution on sharing knowledge and information about medical and health sciences for the academic members, researchers and all of the participants. I also would like to appreciate to all of the committee members for their effort and hard work so that this event can happen.

Once again, welcome to the International Conference on Translational Medicine and Health Science (ICTMHS) in conjunction with Java International Nursing Conference (JINC) 2018. I hope that all of you enjoy your stay at Semarang and we will see you again on the next event.

Prof. Dr. dr. Tri Nur Kristina, DMM, M.Kes

Dean of Faculty of Medicine

Diponegoro University

Welcome message

Assalamulaikum Warahmatullahi Wabarakatuh

Praise goes to the most merciful God Allah SWT for the blessings of life and knowledge for us to gather in this meaningful occasion.

It is a great pleasure and honour for our University to be the host of 2nd International Conference on Translational Medicine and Health Sciences (ICTMHS) in conjunction with 4th Java International Nursing Conference (JINC). The special acknowledgement, I address to the distinguished speakers dr. Bambang Wibowo,Sp.OG(K), MARS from the Ministry of Health Republic of Indonesia, dr. Soetedjo, Sp.S(K) from The Indonesian Medical Association, Prof. Sandra Capra, PhD,FDAA from the University of Queensland-Australia, Prof. Dr.dr Kristina,DMM.,M.Kes from Diponegoro University-Indonesia, Prof. Dra. Setyawati,M.App.Sc.,Ph.D from Faculty of Nursing University of Indonesia, Fiona Miller from Griffith University-Australia, Lybrich Kramer from Hanze University-The Netherland, Anne Hyre from Jhon Hopkins University-United State of America, Kjara Bernadette V. Agatep from St. Paul University-Philippines, Dr.dr.Mexitalia Setiawati, Sp. A(K) from Diponegoro University-Indonesia, and dr.JC. Susanto,Sp.A (K) from Diponegoro University-Indonesia. Thank you for the valuable time to deliver knowledge and share scientific information at this conference. I believe that this opportunity will provide the valuable information for us and deliberate some new research ideas for participants of this conference.

For all participants, I would also like to welcome you at this conference. The origin of the conference theme is reflected from the idea of our Center of Excellence (CoE) which was established in 2012 representing our priority as a research university. Since the declaration of Diponegoro University as a research university, the main theme of every research result will be enhanced to the level of international benchmarking. Diponegoro University, has strong human resources and research background related to translational medicine and health sciences. It is also supported by laboratory such as Center for Biomedical Research.

The theme of this conference is "Creating a Better Future of Healthcare: Partnership in Research, Education and Clinical Care". This interesting issue needs to be discussed in this conference by sharing research findings and ideas. Therefore I believe this international conference will be able to present an interesting discussion with prominent speakers from Indonesia, Australia, Netherland, United States of America and Philippines, giving a contribution the to the development of science and hopefully will encourage more research on this area.

I am grate full to see that this conference has enormous responses from the participants either from domestic or from other countries. The number of publication indexed by reputable database has been set as an indicator for world university rank including Indonesia. Therefore, Diponegoro University also encourages all scientists and academic staffs to increase their publication records in these international reputation journals.

Welcome message

Currently, Diponegoro University is in the 7th position among universities in Indonesia for the number of publications in reputable international journals. The number of Undip scientific publications indexed in Scopus is 2350 documents. I sincerely express appreciation to the organizing committee for their effort to realize this conference. By the end of my short welcome address, I hope our foreign guests take advantage of their stay here to enjoy our beautiful city, Semarang.

Finally, once again I would like to convey a warmest welcome to all the distinguished guests and participants of the conference. Diponegoro University is giving the best to assist you in every way, therefore please enjoy our hospitality and have a delightful experience in the conference.

Wassalamulaikum Warahmatullahi Wabarakatuh

Thank you for your kind attention.

Prof. Dr. Yos Johan Utama,S.H.,M.Hum

Rector of Diponegoro University

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Maternal Characteristics and Serum Zinc Levels with Birth Weight

Banun Lentini[1], *Ani Margawati*[1], *Maria Mexitalia*[2,3]

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ABSTRACT

Introduction: The prevalence of low birth weight and height birth weight are increasing. Birth weight can affect health conditions in adulthood. Maternal characteristics such as maternal age during pregnancy, maternal pre-pregnancy Body Mass Index (BMI), gestational age, MUAC, and serum zinc levels may affect birth weight. Therefore, this research aimed to analyze the correlation of maternal age during pregnancy, maternal pre-pregnancy BMI, gestational age, MUAC, and serum zinc levels with birth weight.

Methods: A total of 65 mothers from 6 public health clinics in Sukoharjo Regency was involved in this observational research determined by quota-sampling method. The data of BMI, maternal age during pregnancy, gestational age, and MUAC were obtained through MCH books. The data of serum zinc levels were obtained from taking blood in the morning when the mothers were not fasting. Data analyses used r Pearson's test, rank Spearman's test, and multiple linear regression with $p<0.05$.

Results: A total 18.5% neonatal had low birth weight with mean of neonatal birth weight was 2935.40±354.66 gram. Maternal pre-pregnancy body mass index ($r=0.271$) and maternal age during pregnancy ($r=0.536$) were significantly correlated with birthweight ($p<0.05$). Gestational age, MUAC, and serum zinc levels did not correlate to birth weight significantly. Maternal age during pregnancy was the most correlating factor with the birth weight.

Conclusion: Body mass index and maternal age during pregnancy were correlated with birth weight. Maternal age during pregnancy is the predictor of birth weight.

Keywords: birth weight; body mass index; maternal age; gestational age; MUAC; serum zinc levels

Maternal Characteristics and Serum Zinc Levels with Birth Weight

Banun Lentini[1], Ani Margawati[2], Maria Mexitalia[3]

ABSTRACT

Background: The prevalence of low birth weight and height birth weight are increasing. Birth weight can affect health conditions in adulthood. Maternal characteristics such as maternal age during pregnancy, maternal pre-pregnancy Body Mass Index (BMI), gestational age, MUAC, and serum zinc levels may affect birth weight. Therefore, this research aimed to analyzed the correlation of maternal age during pregnancy, maternal pre-pregnancy BMI, gestational age, MUAC, and serum zinc levels with birth weight. **Methods:** A total of 65 mothers from 6 public health clinics in Sukoharjo Regency was involved in this observational research determined by quota-sampling method. The data of BMI, maternal age during pregnancy, gestational age, and MUAC were obtained through MCH books. The data of serum zinc levels were obtained from taking blood in the morning when the mothers were not fasting. Data analyses used r Pearson's test, rank Spearman's test, and multiple linear regression with $p < 0.05$. **Results:** A total 18.5% neonatal had low birth weight with mean of neonatal birth weight was 2935.40±354.66 gram. Maternal pre-pregnancy body mass index ($r = 0.271$) and maternal age during pregnancy ($r = 0.536$) were significant correlated with birthweight ($p < 0.05$). Gestational age, MUAC, and serum zinc levels were not significantly correlate with birth weight. Maternal age during pregnancy is the factor most correlate with the birth weight. **Conclusions:** Body mass index and maternal age during pregnancy were correlated with birth weight. Maternal age during pregnancy is the predictor of birth weight.

Keywords: Birth weight, body mass index, maternal age, gestational age, MUAC, serum zinc levels

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A. INTRODUCTION

The prevalence of Low Birth Weight (LBW) and macrosomi is still quite high in the world, especially in developing countries. The prevalence of LBW reaches 95.6% in developing countries from 20% of the LBW incidence in worldwide (1.2). Approximately 10.2% of LBW incidence was found in Indonesia (2.3). It was found that the incidence of LBW in Sukoharjo Regency in Central Java reached 12.53% and also increased from 476 to 486 infants from 2014 to 2015 (3). In addition, the prevalence of macrosomi in developing countries also reaches 20%. This prevalence has also increased from 15% to 25% in the last two to three decades (4) and HBW incidence in Indonesia reached 4.8% (5).

Birth weight can affect the health condition of the mother and infant in the future (6). Low birth weight can increase 20 times the risk of non-communicable diseases (diabetes and CVD) (1), autism spectrum disorder (ASD) (7), and death (2). Beside that, HBW can also increase the risk of childbirth with *Sectio Caesarian* (SC) to the mother (6). In addition, HBW can also increase the long-term risk in the infant such as overweight and obesity (8).

There are several factors that influence birth weight such as maternal age during pregnancy, maternal pre-pregnancy BMI, gestational age, Mid-Upper Arm Circumference (MUAC), and maternal serum zinc levels. Pre-pregnancy maternal body mass index in underweight category can increase the risk of LBW (9, 10). However, greater maternal pre-pregnancy BMI is in line with the increased risk of HBW incidence ($p < 0.001$) (9). Maternal age also affects the neonatal birth weight. The research conducted in Nepal showed that maternal less than 20 years old had two-times increased risk of delivering neonatal low birth weight (11). These research support the

previous research in New South Wales which has found that maternal age less than 20 years old was the single factor of neonatal low birth weight (12). However, the research conducted in the United States of America showed that maternal age was not significantly correlated with low birth weight (13). Gestational age is also correlated with birth weight. Gestational age of less than 37 weeks can increase 27.3% the risk of neonatal LBW (14). The subsequent factor of low maternal MUAC also consistently increases the risk of delivering LBW infants by 1.5 to 8.1 (15). Micro-nutrient deficiency can also affect the birth weight, one of which is zinc deficiency. Approximately 82% of maternal in the world had zinc deficiency (16). Maternal zinc deficiency may increase the risk of LBW ($p < 0.001$) (16). However, research on serum zinc levels in Indonesia is still rare. Therefore, this research aimed to analyse the risk of maternal age, BMI, gestational age, MUAC, and serum zinc levels in birth weight.

B. METHODS

This research was conducted at 6 public health clinics in Sukoharjo Regency from February to April 2018 with quota-sampling technique. This research was an observational analytic with cross-sectional design. Research subjects were the mothers who gave birth to 48-hour *postpartum*, were single pregnant, resided and settled in the research area, had a Mother and Child Health (MCH) book, performed ANC (Antenatal Care) during the first trimester, and were willing to perform blood serum zinc test.

Body mass index was obtained from the ratio of body weight (kg) and height of (m) squared. The data of maternal age during pregnancy, gestational age, and MUAC were obtained through MCH books. Blood serum zinc levels were obtained from taking blood in the morning when the mothers were not fasting (17).

The maternal-age data were analysed using r Pearson's test because of the normal distribution, whereas the data of BMI, blood serum zinc levels, gestational age, and MUAC were analysed using rank Spearman's test

because of the abnormal distribution with $p < 0.05$. Multiple linear regression was performed on the variables having $p < 0.25$ in bivariate test results.

C. RESULTS

Table 1 showed the basic characteristics of the research subjects. The mean birth weight was 2935.40 ± 354.66 grams with 18.5% of the neonatal were born with low birth weight. Maternal pre-pregnancy body mass index mean was 21.46 ± 3.94 kg/m2, but the BMI of 17 kg/m2 was still found in maternal. It was found that the mean of gestational age was 38.07 ± 2.61 weeks, and the mean of MUAC was 25.00 ± 2.63 cm. The mean of serum zinc levels was 43.20 ± 16.38 umol/L.

Table 1. Basic Characteristics of the Research Subjects

Variables	Frequency		Min.	Max.	SD±Mean
	n	%			
Birth Weight (g)			2300	3600	2935,40±354,66
- LBW	12	18.5			
- Normal	53	81.5			
Maternal Age (years)			17	47	28,80±6,98
Pre-Pregnancy BMI			14.3	33.3	21,46±3,94
Gestational Age (weeks)			28	41	38,07±2,61
MUAC (cm)			20	32	25,00±2,63
Serum Zinc Levels			22	159	43,20±16,38

The analysis results among variables can be seen in Table 2. The r Pearson's test was used to determine the correlated of maternal age and birth weight while the rank Spearman's test was used to analyse pre-pregnancy BMI, gestational age, MUAC, and maternal serum zinc levels, and birth weight. The maternal age during pregnancy and pre-pregnancy BMI were significantly correlated with birth weight ($p < 0.05$). However, gestational age, MUAC, and serum zinc levels did not indicate significant results ($p > 0.05$). However, the five variables had a positive correlation with birth weight. The maternal age during pregnancy was found to be positively correlated with birth weight with $r = 0.536$. This means that the higher of

maternal age during pregnancy is, the greater the birth weight will be. Maternal body mass index during pregnancy was also positively associated with birth weight with r = 0.271. It means that the higher of maternal pre-pregnancy BMI is, the greater of birth weight will be. The positive correlation was also seen in the correlation of gestational age, MUAC, and serum zinc levels with birth weight (r = 0.19, r = 0.208, and r = 0.234, respectively). This means that the higher the gestational age, MUAC, and serum zinc level are, the greater of birth weight will be.

Table 2. The Correlation of Maternal Characteristics and Serum Zinc Levels and Birth Weight

Variables	Birth Weight	
	r	p
Maternal age during pregnancy	0.536	0,000[a]
Pre-pregnancy BMI	0.271	0,029[b]
Serum zinc levels	0.19	0,13[b]
Gestational age	0.208	0,096[b]
MUAC	0.234	0,060[b]

[a]r Pearson's test, [b]rank Spearman's test

Based on the correlation analysis, all variables had p < 0.25. Therefore, the variables were further analysed using multiple linear regression to find out the predictor variable for birth weight. The results showed that the maternal age during pregnancy was the most significant predictor correlated with birth weight (Table 3). In addition, the value of Adjusted R square was 0.276 which means that 27.6% of the birth-weight variation can be explained by the variation of the maternal age during pregnancy.

Table 3. The Newborn Determinant Factors

Variables	Coefficient	Correlation coefficient	p
Maternal age	27.215	0.536	0.000.
Constants	2151.598		

*Multiple Linear Regression

D. DISCUSSIONS

This research results indicated that18.5% of the neonatal had low birth weight. The maternal age and maternal pre-pregnancy BMI were significantly

correlated with birth weight while the gestational age, MUAC, and serum zinc levels were not significantly correlated with birth weight. However, all of these variables had a positive relationship with birth weight.

The mean birth weight in this research was 2935,40±354,66 grams with low birth weight was found in 18.5%. It is lower than the previous research conducted at Pasar Rebo Hospital East Jakarta and Bogor Regency (18, 19). However, the percentage of low birth weight is higher than the research conducted in Indonesia and several other research (5, 20, 21). The research conducted in Sudan and Ethiopia showed that prevalence of LBW was found in 12.2% and 17.8% of infants (20, 21). Contrasly, the research in Indian result was found showed that 20% of infants had low birth weight (22). The discrepancy of mean results and prevalence are probably caused by areas and economic conditions of the research subjects. In addition, the high prevalence of LBW can be caused by low husband and social supports and maternal ignorance to pregnancy (21, 23).

Maternal age and maternal pre-pregnancy BMI have a significant correlate with birth weight. The increasingly mature maternal pre-pregnancy age is positively associated with weight of the infant being born. This indicates that the more mature the maternal age is, the greater the infant weight will be. Whereas, the younger maternal age is, the lower the infant weight will be. These results are consistent with the research conducted by Koyanagi shows that the maternal age of 20-34 years tend to give birth to infants with high birth weight (4). These results also support the theory that young maternal age increases the risk of low birth weight (14, 24). The research conducted in Oman showed that the maternal age above 20 years can increase risk of low birth weight (14). This is caused by young maternal age still need nutrients for the needs of the body. So, nutrients that should be given to the fetus actually are shared to the mother (25).

The pre-pregnancy body mass index is positively correlated with the birth weight. This result is consistent with the previous research which

suggests that BMI is associated with birth weight (4, 9, 26). The research conducted by Frederick shown that BMI is a factor associated with birth weight (9). Another research also suggests that higher BMI before pregnancy is associated with increased risk of birth weight (27). Pre-pregnancy body mass index will affect maternal weight gain during pregnancy and birth weight (28, 29). The research conducted on working women showed that overweight women experience weight gain during pregnancy above the recommended weight gain (28).

Mid-Upper Arm Circumference is positively correlated with birth weight although it is not statistically significant. This means that low MUAC can reduce birth weight. These results support the results of previous research suggesting that a low MUAC may increase the risk the incidence of low birth weight by 1.5 to 8.1 times (15, 30, 31). MUAC of less than 23.5 cm is at risk of Chronic Energy Deficiency (DEC) and is associated with weight gain during pregnancy (32). The next factor of gestational age also has no significant relationship with birth weight. This result is different from the previous research result conducted in Australia stating that low gestational age is a single factor of low birth weight (12). Nevertheless, the result of this research showed a positive correlation with the birth weight which means that the older gestational age will increase the birth weight and prevent the low birth weight. The research conducted in Oman showed that the gestational age of less than 37 weeks increased the risk of a newborn with low birth weight 27.3% (14).

Serum zinc levels were not correlated with birth weight. These results are consistent with previous research which suggest that serum zinc levels are not associated with birth weight (33, 34, 35). Although it is not statistically related, serum zinc levels are positively correlated with birth weight. This means that the increased serum zinc levels can increase the birth weight. These results support the existing theories that serum zinc levels can increase birth weight (36, 37). Serum zinc levels, among others, serve as mitosis of

DNA synthesis and gene activation (38, 39). Other research has found that serum zinc levels maternal under 6.4 mol/L and pre-pregnancy weight under 55 kg were at risk getting LBW by 3.8 and 4.2 times (40).

Based on the result of multiple linear regression test, the predictor factor of birth weight was the maternal age during pregnancy with R Adjusted square value of 27,6%. This proves that there are still other variations associated with birth weight

E. CONCLUSIONS

Maternal age during pregnancy and pre-pregnancy maternal BMI are significantly correlated with birth weight. Maternal age during pregnancy is a predictor factor of birth weight.

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