



# Risk Factors of Morbidity During Pregnancy in West Jakarta, Indonesia

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**Submission date:** 28-Jul-2021 09:46AM (UTC+0700)

**Submission ID:** 1624898195

**File name:** FIXED\_Errypaper-template\_ACN\_2019\_IJ.docx (55.84K)

**Word count:** 3708

**Character count:** 21431

# Risk Factors of Morbidity During Pregnancy in West Jakarta, Indonesia

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(Received Month DD, YYYY)

**Background/Aims:** Maternal morbidity during pregnancy is one of the quality indicators of obstetric care. This study was aimed to analyze the risk factors of maternal morbidity during pregnancy. **Methods:** This was a cross-sectional study in a health centers in Sub-district of Kebon Jeruk, West Jakarta, involving 67 pregnant women. Morbidity status were observed by five (5) illness indicators namely: fever, painful urination, frequent, and less, yellowish eyes and skin, dark urine, dizziness, pale, listless, and tiredness, breathlessness, or shortness of breath. All measurement was carried out from December 1<sup>st</sup>, 2016 to March 31<sup>st</sup>, 2017 by well trained professional health personnels. Means difference test was employed to evaluate the hypothesis. **Results:** About 40.3% of pregnant women has a high score of morbidity. The average of Mid-Upper Arm Circumference (MUAC), birth weight, birth length, haemoglobin, and urine osmolality were  $27.1 \pm 3.5$  cm,  $57.4 \pm 10.1$  kg,  $154.0 \pm 12$  cm,  $11.5 \pm 1.0$  g/dL,  $549 \pm 309$  mOsm/kg, respectively. There's no differences of mother's aged, MUAC, weight, height, and hemoglobin between dehydrated and normal groups ( $p \geq 0.05$ ). MUAC, haemoglobin, hydration status and mother's behaviour were not influencing morbidity status ( $p \geq 0.05$ ). There is a possibility that pregnancy morbidity associated directly with sanitation status and other ecologic factors of pregnant women. **Conclusion:** In this study, nutritional factors such as MUAC, haemoglobin and hydration status are not directly associated with the morbidity.

**Key Words** Dehydration · Morbidity · Nutritional status · Pregnant women

1 Maternal morbidity is one indicator of quality in obstetric  
2 care next to maternal mortality statistics.<sup>1</sup> Maternal  
3 morbidity during pregnancy can impact to infant growth  
4 and leading to low birth weight. The mother who were  
5 having depressed in the third trimester were 2.1 times more  
6 likely to have a low birth weight (<2.5 kg) than other  
7 mother. In other hand, maternal morbidity in the prenatal  
8 period associate with the malnutrition and stunted in the  
9 9<sup>th</sup> year of life in developing countries.<sup>2</sup> Pregnant and  
10 lactating women, infants, and young children are  
11 nutritionally vulnerable group were need the additional  
12 intake of nutrient requirement for optimal growth and  
13 development.<sup>3</sup> Nutritional status has been related to  
14 pregnancy outcomes. Even though, many factors contribute  
15 to birth outcomes such as biologic factors, socioeconomic,  
16 teenage pregnancy, short interpregnancy interval<sup>4</sup> and  
17 demographic factors, in different populations.<sup>5</sup> Poor  
18 maternal nutritional status has a impact to high number of  
19 morbidity and mortality in maternal and child especially in  
20 rural communities, that need efforts to concentrate on risk  
21 factors specific for each community.<sup>6,7</sup>

22  
23 Maternal hydration as a controlling factor of amniotic fluid  
24 volume. The factor involved to keep amniotic fluid volume  
25 are when in fetal urination and swallowing. Other study  
26 found the maternal hydration increased the mean amniotic  
27 fluid index by  $0.87 \pm 0.29$  in women with less amniotic

28 fluid.<sup>8</sup> Water is essential liquid nutrient this keep the fluid  
29 balance mechanism in our body<sup>9</sup>. During pregnancy, the  
30 body has change in the extracellular volume and  
31 vasopressin secretion that induced a shift in plasma  
32 osmolality levels about 10 mOsm/kg lower than that in  
33 nonpregnant women.<sup>10</sup> Loss of the body fluid commonly  
34 incurred due to sweating, respiratory loss, nausea and  
35 vomiting, hyperemesis, losses in the urine and stools.<sup>11-13</sup>  
36 Both of acute and chronic dehydration in pregnancy can  
37 increase the risk of morbidity and mortality.<sup>13</sup> Dehydration  
38 may be occurred in tropical country, such as Indonesia.  
39 Study in Indonesia found the urine osmolality can be used  
40 as a dehydration biomarker.<sup>14</sup> The study of hydration in  
41 human have a limitation compared to animal study.  
42 Therefore, this study wants to give the information about  
43 hydration and morbidity in pregnant women.

44  
45 Many factor contribute to morbidity, such as biological  
46 factor, socio-demographic,<sup>15</sup> and maternal behavior.<sup>16</sup>  
47 Pregnant behaviors commonly shown by poor diet,<sup>17</sup>  
48 smoking behavior,<sup>18,19</sup> drink alcoholic,<sup>20</sup> hygiene and  
49 sanitation, and weight monitoring.<sup>21</sup> As a mother,  
50 physiologically should be optimal to follow the pregnancy  
51 period. Pregnancy intention might be an indicator of  
52 increased risk for low birth weight and maternal  
53 outcomes.<sup>22</sup> This condition associated with increased  
54 prevalence of some pregnancy complication, notably

preterm delivery, growth restriction, and low birth weight.<sup>23</sup> The objective of this study was to comprehend the risk factor of morbidity during pregnancy in West Jakarta.

## MATERIALS AND METHODS

This study was a cross-sectional study of hydration in pregnant women at health center sub district of Kebon Jeruk, West Jakarta. The subject of this study is pregnant women who came to health center from December 1<sup>st</sup>, 2016 to March 31<sup>st</sup>, 2017. The study site location selected from the highest of pregnancy examination for district-level health center in the sub districts of West Jakarta. The ethical approval this study was granted by the Ethics Committee of the Faculty of Medicine, University of Indonesia (No. 869/UN2.F1/ETHICS/2016).

The total subject of this study was 67 pregnant women, with the 13 inclusion criteria. There are as follow; 1). having done the pregnancy examination in health center of study location, 2). have entered in the second trimester (>12-24 weeks), 3). in normal health condition (no have secondary infection), 4). never having history of giving birth in the low-birth-weight or stunted infant (<48 cm), 5). between of >18 and 35 years of age, 6). having a height of 150 -165 cm, 7). having BMI (normal) 18.0 to 25.0, 8). having experienced of urinary tract infection, 9). having experienced of diarrhea, nausea, or vomiting in the early pregnancy, 10). have planning to delivery baby in the health center of study location, 11). having never history of caesarean delivery, 12). given approval in this study by signed in the informed consent, 13). comply with the study procedure.

The data collected from subject are characteristics as follows (age, parity, body weight, body height, body temperature, (MUAC), hydration status, morbidity and pregnancy behavior. The identity and characteristics (parity and age), morbidity and pregnancy behavior collected from questionnaire interview. Anthropometrics data such as body weight, body height, body temperature, MUAC measured by trained enumerator. Body weight measure using a weighing scale and rounded to the nearest 0.1 kg; body height measure using microtoise stature meter (accuracy 0.1 cm); body temperature measured by digital thermometer; MUAC measured by meter line (accuracy 0.1 cm). Urines were collected in the afternoon (02.00–04.00 pm) and analyzed at an Accredited Laboratory. Urine osmolality measured by the device Roebing Osmometer 13 DR automatic with Osmoprinter DR 02.

The indicator of dehydration was measured by urine osmolality ( $\geq 500$  mOsm/kg). Nutritional status were measured by MUAC (< 23.5 cm in chronic energy deficiency) and for anemia status measured by hemoglobin level (< 11.0 mg/dL). Morbidity were observed by five (5) indicator illness; 1). fever; 2). painful urination, frequent, and less; 3). yellowish eyes and skin, dark urine; 4). dizziness, pale, listless, and tiredness; 5). breathlessness, or shortness of breath. From five indicator illness, we score and categorized into two level; 1). Low (rare to get a sick) and 2). High (often to get a sick). Pregnancy behaviors were

observed by four (4) behaviors; 1). drinking alcoholic; 2). taking drug for a special disease; 3). drinking traditional herbs; 4). smoking. From four indicator behaviors were categorized into two; 'Less' and 'Good'.

Data analyzed was to identify characteristics subject, morbidity and pregnancy behaviors. The association between nutritional status, hydration status and morbidity were ascertained. A difference in distribution test was employed to answer the research question.

## RESULTS

From the table 1, it's showed that characteristics subject such as mother's age, parity, MUAC, body weight, body height, body temperature, hemoglobin, and urine osmolality. From 67 subjects who participated in this study, the mother's age 26.4 (y), 46.3% in the first parity, and having normal of MUAC, body weight and height, body temperature, and hemoglobin. The average of urine osmolality was indicated that the mothers in dehydration condition ( $\geq 500$  mOsm/kg).

The table 2 shows that from the five indicator illness of morbidity. Commonly, most of subject having health history of painful urination, frequent, and less, dizziness, pale, listless, and tiredness, and breathlessness, or shortness of breath in the period of pregnancy (one last month). The negative behavior that usually happen in pregnant mother's who live in this study location such as drinking alcoholic, taking drug for a special disease, drinking traditional herbs, and smoking. They taking the drug for special disease if they felt sick such as influenza, fever, and dizzy. The traditional herbs that usually they consume have function to reduce nausea and refresh their body.

From the five indicators illness of morbidity, we did the scoring and categorization became two level of morbidity. The category of morbidity is low and high. We also did the categorization of pregnant mother's behavior became two categories; less and good.

This study was using MUAC and hemoglobin to measure association between nutritional status and morbidity in pregnancy period. The indicator of dehydration was using urine osmolality as a biomarker for pregnant mother.

Table 3 shows there is no association between nutritional status and morbidity ( $p \geq 0.05$ ). This study found that there's no significant between hydration status and morbidity ( $p \geq 0.05$ ). Also, there's no significant between mother's behavior and morbidity ( $p \geq 0.05$ ).

## DISCUSSION

Pregnant and lactation women are nutritionally vulnerable groups. These groups also have a high risk of death, therefore a holistic effort to improve their health status to reduce morbidity and mortality rate. Maternal hydration is one of problems in pregnancy period, it caused by maternal behavior, biological factor, socio-demographic, etc. The subject who participated in this study has normal BMI, weight and height, body temperature, and hemoglobin.

Most of them were in the first parity. This study used urine osmolality as a biomarker of hydration status. Other study also used urine osmolality as a biomarker of hydration status for children,<sup>24</sup> athletes,<sup>25,26</sup> adults' women and men.<sup>27,28</sup> Urine osmolality is an easy biomarker to monitor the daily of hydration<sup>29</sup> and more sensitive in the short term measurement<sup>30</sup> compared to other methods. Urine osmolality that used a biomarker in the afternoon spot is equivalent to 24 h Urine Osmolality.<sup>31</sup> This study found the average of urine osmolality in pregnant women is higher than normal  $\geq 500$  mOsm/kg, it's means most of pregnant women in a dehydration status. Other study reveals that a 24 h urine osmolality  $< 500$  mOsm/kg as a simple cut-off point for indicator optimal hydration, its representing total daily fluid intake adequate.<sup>32</sup>

This study used five indicator illness of morbidity. Most of subject having health history of painful urination, frequent, and less; dizziness, pale, listless, and tiredness; and breathlessness, or shortness of breath. Commonly pregnant women having history of painful urination, tiredness, and breathlessness (in the third trimester). Metabolic, anatomic, and physiologic changes in pregnancy period were serious problem and add to the diagnostic and therapeutic challenge. This condition is a potentially problem for the fetus and the mother.<sup>33</sup>

Many factors contribute to high morbidity in pregnancy. One of factor is maternal behavior, such as drinking alcoholic, taking drug for a special disease, drinking traditional herbs, and smoking. That's behavior has a long-term effect on specific psychopathology in offspring. Therefore, there's a need program to prevention and cessation the negative behaviors in women during pregnancy.<sup>34,35,36</sup>

Our results indicated there was a tendency that three variables, namely nutritional status, hydration status and nad maternal behavior, to affect maternal morbidity. Other study found low nutritional status in pregnant women is a crucial factor to maternal morbidity, that influence to pregnancy outcome.<sup>37,38</sup> The increasing of mild dehydration plays a role in development of morbidities.<sup>39</sup> Therefore, maternal hydration is important factor to keep mother's health status. Maternal hydration in a short-term can increase the amniotic fluid index, especially in third trimester pregnancy.<sup>40,41</sup> Other study stated that acute systemic mild hypohydration or dehydration might be a pathogenic factor for some diseases and symptom in pregnancy period, such as oligohydroamnions, prolonged labor, cystic fibrosis, hypertonic dehydration, and renal toxicity of xenobiotics.<sup>42</sup> Indirectly, dehydration give impact to morbidity and mortality in pregnancy period. Hence, this study suggest that pregnant women should be better to maintenance their fluid and electrolyte balance as a part of their health status, such as to reduce morbidity rate.

#### Conclusions

The study reveals there was no any association between dehydration and morbidity, also failed to find the association between nutritional status and morbidity. Since,

dehydration and nutritional status were factors might affect to high morbidity among pregnant mothers. Therefore, this study recommends to update the protocols of dehydration and nutritional status to see more deep relationship between two variables and morbidity.

#### Acknowledgments

This study was fully funded by the Indonesian Danone Institute Foundation. The views expressed herein are those of the individual authors, and do not necessarily reflect those of the Indonesian Danone Institute Foundation.

#### REFERENCES

- Mawarti Y, Adi U, Mohammad H. Maternal care quality in near miss and maternal mortality in an academic public tertiary hospital in Yogyakarta, Indonesia: a retrospective cohort study. *BMC Pregnancy and Childbirth*. 2017. 17:149. doi: 10.1186/s12884-017-1326-4.
- Wendt A, Cassandra MG, Stacey P, Carol JH. Impact of Increasing Inter-pregnancy Interval on Maternal and Infant Health. *Paediatr Perinat Epidemiol*. 2012. 26(01): 239–258. doi:10.1111/j.1365-3016.2012.01285.x.
- Dewey KG. The Challenge of Meeting Nutrient Needs of Infants and Young Children during the Period of Complementary Feeding: An Evolutionary Perspective 1–3. *J. Nutr*. 2013. 143: 2050–2054.
- Purandare CN. Maternal Nutritional Deficiencies and Interventions. *The Journal of Obstetrics and Gynecology of India*. 2012;62(6):621 – 623. doi: 10.1007/s13224-013-0347-9.
- Abu-Saad K and Drora F. Maternal Nutritional and Birth Outcomes. *Epidemiol Rev*. 2010; 32:5 – 25. doi: 10.1093/epirev/mxq001.
- Senbanjo IO, Ibiyemi OO, Wasio AA, Olayinka CS. Maternal and Child Under-Nutrition in Rural and Urban Communities of Lagos State, Nigeria: the relationship and risk factors. *BMC Research Note*. 2013. 6:286. doi:10.1186/1756-0500-6-286.
- Young S, Murray K, Mwesigwa J, Natureeba P, Osterbauer B, et al. Maternal Nutritional Status Predicts Adverse Birth Outcomes among HIV Infected Rural Ugandan Women Receiving Combination Antiretroviral Therapy. *PLoS ONE*. 2012; 7(8): e41934. doi:10.1371/journal.pone.0041934.
- Zakaria Abd El M, Sedek Abd El M A, Abohassan NA. Amniotic Fluid Changes and Doppler Studies in Unexplained Oligohydramnios before and after Intravenous Maternal Hydration. *The Egyptian Journal of Hospital Medicine*. 2018. Vol. 73 (2): Page 6052-6063.
- Jequier E, Constant F. Water as an Essential Nutrient: The Physiological Basis of Hydration. *Eur J Clin Nutr* 2010;64:115-23. doi: 10.1038/ejcn.2009.111.
- Hughes F, Mythen M, Montgomery H. The sensitivity of the human thirst response to changes in plasma osmolality: a systematic review. 2018. *Perioperative Medicine*. 7:1. Doi:10.1186/s13741-017-0081-4.
- Armstrong LE, Johnson EC, Munoz CX, Swokla B, Le Bellego L, Jimenez L, Casa DJ, Maresh CM. Hydration

- 298 biomarkers and dietary fluid consumption of women. *J*  
 299 *Acad Nutr Diet.* 2012;112:7:1056-61.
- 300 12) Maughan RJ. Hydration, morbidity, and mortality in  
 301 vulnerable populations. *Nutrition Reviews.* 2012; Vol.  
 302 70(Suppl. 2):S152–S155. doi:10.1111/j.1753-  
 303 4887.2012.00531.x.
- 304 13) Birkeland E, Stokke G, Tangvik RJ, Torkildsen EA,  
 305 Boateng J, Wollen AL, et al. Norwegian PUQE  
 306 (Pregnancy-Unique Quantification of Emesis and  
 307 Nausea) Identifies Patients with Hyperemesis  
 308 Gravidarum and Poor Nutritional Intake: A Prospective  
 309 Cohort Validation Study. *PLoS ONE* 2015; 10(4):  
 310 e0119962. doi:10.1371/journal.pone.0119962.
- 311 14) Mulyani EY, Hardinsyah, D Briawan, BI Santoso.  
 312 Hydration status of pregnant women in West Jakarta.  
 313 *Asia Pac J Clin Nutr* 2017;26(Suppl 1):S26-S30. doi:  
 314 10.6133/apjcn.062017.s14.
- 315 15) Amugsi DA, Aborigo RA, Oduro AR, Asoala V,  
 316 Awine T, Amenga-Etego L. Socio-demographic and  
 317 environmental determinants of infectious disease  
 318 morbidity in children under 5 years in Ghana. *Glob*  
 319 *Health Action.* 2015. 8: 29349 -  
 320 <http://dx.doi.org/10.3402/gha.v8.29349>.
- 321 16) Usfar AA, Fahmida U. Do Indonesians follow its  
 322 dietary guidelines? - Evidence related to food  
 323 consumption, healthy lifestyle, and nutritional status  
 324 within the period 2000-2010. *Asia Pac J Clin Nutr.*  
 325 2011. 20:484-94. doi: 10.6133/apjcn.2011.20.3.20.
- 326 17) Danielewicz H, G. Myszczyzyn, A. Dębińska, A.  
 327 Myszkal, A. Boznański, L. Hirnle. Diet in pregnancy—  
 328 more than food. *Eur J Pediatr.* 2017. 176:1573–1579.  
 329 Doi:10.1007/s00431-017-3026-5.
- 330 18) Lauria L, Lamberti A, Grandolfo M. Smoking  
 331 Behaviour before, during, and after Pregnancy: The  
 332 Effect of Breastfeeding. *The Scientific World Journal.*  
 333 2012. Article ID 154910; 9 pages.  
 334 doi:10.1100/2012/154910.
- 335 19) Hayes C, Kearney M, O'Carroll H, Zgaga L, Geary M,  
 336 Kelleher C. Patterns of Smoking Behaviour in Low-  
 337 Income Pregnant Women: A Cohort Study of  
 338 Differential Effects on Infant Birth Weight. *Int. J.*  
 339 *Environ. Res. Public Health* 2016. 13:1060;  
 340 doi:10.3390/ijerph13111060.
- 341 20) Skagerstro'm J, Chang G, Nilsen P. Predictors of  
 342 Drinking During Pregnancy: A Systematic Review.  
 343 *Journal of Women's Health.* 2011, Vol.20:6. doi:  
 344 10.1089/jwh.2010.2216.
- 345 21) Kost K and L Linberg. Pregnancy Intentions, Maternal  
 346 Behaviors, and Infant Health: Investigating  
 347 Relationships With New Measures and Propensity  
 348 Score Analysis. *Demography.* 2015. 52:83–111. doi  
 349 10.1007/s13524-014-0359-9.
- 350 22) Hall JA, Benton L, Copas A, Stephenson J. Pregnancy  
 351 Intention and Pregnancy Outcome: Systematic Review  
 352 and Meta-Analysis. *Matern Child Health J.* 2017.  
 353 21:670–704. Doi: 10.1007/s10995-016-2237-0.
- 354 23) Ray JG, Park A, Fell DB. Mortality in Infants Affected  
 355 by Preterm Birth and Severe Smallfor-Gestational Age  
 356 Birth Weight. *PEDIATRICS.* 2017. Vol. 140; 6:  
 357 e20171881.
- 358 24) Kavouras SA, Johnson EC, Bougatsas D, Arnaoutis G,  
 359 Panagiotakos DB, Perrier E, et.al. Validation of urine  
 360 scale for assessment of urine osmolality in healthy  
 361 children. *Eur J Nutr.* 2016. 55:907-915. doi:  
 362 10.1007/s00394-015-0905-02.
- 363 25) Braun H, Andrian-Werburg JV, Malisova O,  
 364 Athanasatou A, Kapsokefalou M, Ortega JF, Mora-  
 365 Rodriguez R, Thevis M. Differing Water Intake and  
 366 Hydration Status in Three European Countries—A  
 367 Day-to-Day Analysis. *Nutrients* 2019, 11, 773;  
 368 doi:10.3390/nu11040773.
- 369 26) Bak A, Tsiami A, Greene C. Methods of Assessment  
 370 of Hydration Status and their Usefulness in Detecting  
 371 Dehydration in the Elderly. *Curr. Res. Nutr Food Sci*  
 372 *Jour.* 2017. Vol. 5(2), 43-54.
- 373 27) Perrier ET, JH Bottin, M Veccheo, G. Lemetais.  
 374 Criterion values for urine-specific gravity and urine  
 375 color representing adequate water intake in healthy  
 376 adults. *European Journal of Clinical Nutrition.* 2017;  
 377 71, 561–563. doi:10.1038/ejcn.2016.269.
- 378 28) Perrier E, P Rondeau, M Poupin, L Le Bellego, LE  
 379 Armstrong, F Lang, et.al. Relation between urinary  
 380 hydration biomarkers and total fluid intake in healthy  
 381 adults. *European Journal of Clinical Nutrition.* 2013;  
 382 67, 939–943; doi:10.1038/ejcn.2013.93.
- 383 29) McKenzie AL, Perrier ET, Guelinckx I, Kavouras SA,  
 384 Aerni G, Lee EC, Volek JF, Maresh CM, Armstrong  
 385 LE. Relationships between hydration biomarkers and  
 386 total fluid intake in pregnant and lactating women. *Eur*  
 387 *J Nutr.* 56:2161–2170. doi:10.1007/s00394-016-1256-  
 388 3.
- 389 30) Perrier E, Rondeau P, Poupin M, Bellego L Le,  
 390 Armstrong LE, Lang F, Stookey J, Tack I, Vergne S,  
 391 Klei A. Relation between urinary hydration biomarkers  
 392 and total fluid intake in healthy adults. *European*  
 393 *Journal of Clinical Nutrition.* 2013. 67: 939–943.
- 394 31) Lemetais G, Bottin J, Poupin M, Jimenez L, Perrier E.  
 395 Afternoon Spot Urine Osmolality as a Biomarker of  
 396 Hydration in Free-living Healthy Adults. *The FASEB*  
 397 *Journal* 2015; vol. 29 no. 1 Supplement 967.4.
- 398 32) Perrier ET, I Buendia-Jimenez, M Veccheo, LE  
 399 Armstrong, I Tack, A Klein. Twenty-Four-Hour Urine  
 400 Osmolality as a Physiological Index of Adequate  
 401 Water Intake. *Disease Markers.* 2015; Vol 2015;  
 402 Article ID 231063, 8 pages.  
 403 <http://dx.doi.org/10.1155/2015/231063>.
- 404 33) Meher S, Gibbs N, DasGupta R. Renal stones in  
 405 pregnancy. *Obstetric Medicine.* 2014. Vol. 7(3) 103–  
 406 110.
- 407 34) Talati A, Bao Y, Kaufman J, Shen L, Schaefer CA,  
 408 Brown AS. Maternal Smoking During Pregnancy and  
 409 Bipolar Disorder in Offspring. *Am J Psychiatry.* 2013.  
 410 170(10): 1178–1185.  
 411 doi:10.1176/appi.ajp.2013.12121500.
- 412 35) Agrawal A, Jeffrey FS, Julia PG, Carolyn ES, Michele  
 413 LP, Alexis ED, et.al. The effects of maternal smoking  
 414 during pregnancy on offspring outcomes. *Preventive*  
 415 *Medicine* 2010. Vol. 50, Issues 1–2: Pages 13-18.
- 416 36) Taylor AE, Carslake D, de Mola CL, Rydell S M,  
 417 Nilsen TIL, Bjørngaard JH, Horta BL, Pearson R, Rai  
 418 D, Galanti MR, et.al. Maternal Smoking in Pregnancy  
 419 and Offspring Depression: a cross cohort and negative  
 420 control study. *Scientific Reports.* 2017. 7: 12579.  
 421 doi:10.1038/s41598-017-11836-3.

- 422 37) Padhi BK, Baker KK, Cumming O, Freeman MC, 453  
423 Satpathy R, Das BS, Panigrahi P. Risk of Adverse 454  
424 Pregnancy Outcomes among Women Practicing Poor 455  
425 Sanitation in Rural India: A Population-Based 456  
426 Prospective Cohort Study. *PLOS Medicine*. 2015. 457  
427 Vol12: 7. 458
- 428 38) Azuh DE, Azuh AE, Iweala EJ, Adeloye D, Akanbi M, 459  
429 Mordi RC. Factors influencing maternal mortality 460  
430 among rural communities in southwestern Nigeria. 461  
431 *International Journal of Women's Health*. 2017. 9:179– 462  
432 188. 463
- 433 39) Manz F. Hydration and Disease. *Journal of the 464  
434 American College of Nutrition* 2013; Vol 26: Pages 465  
435 535S-541S. 466
- 436 40) Ezzo S, Noventa M, Vitagliano A, Dall'Asta A, 467  
437 D'Antona D, Aldrich CJ, Quaranta M, Frusca T, 468  
438 Patrelli TS. An Update on Maternal Hydration 469  
439 Strategies for Amniotic Fluid Improvement in Isolated 470  
440 Oligohydramnios and Normohydramnios: Evidence 471  
441 from a Systematic Review of Literature and Meta- 472  
442 Analysis. *PLoS ONE*. 2015.10(12); 473  
443 e0144334.doi:10.1371/journal.pone.0144334. 474
- 444 41) Tarannu K, Alam AA, Irfan H, Shankar GR, Md. 475  
445 Parwez A. Oligohydramnios and Fetal Outcome: A 476  
446 Review. *MED PHOENIX : An Official Journal of NMC,* 477  
447 *Birgunj, Nepal*. 2016. Volume (1), Issue (1). ISSN: 478  
448 2392 – 425X. 479
- 449 42) El-Sharkawy AM, Opinder S, and Dileep NL. Acute 480  
450 and chronic effects of hydration status on health. 481  
451 *Nutrition Reviews*; 2015: Vol. 73(S2):97–109. doi: 482  
452 10.1093/nutrit/nuv038.

Table 1. Characteristics Subject

Variables	N (67)
Mother's age (y)	26.4 ± 4.5
Parity:	
a. First	31 (46.3)
b. Second	26 (38.8)
c. Third	10 (14.9)
MUAC (cm)	27.1 ± 3.5
Body Weight (kg)	57.4 ± 10.1
Body Height (cm)	154.0 ± 4.2
Body Temperature (°C)	36.0 ± 1.3
Hemoglobin (gr/dl)	11.5 ± 1.0
Urine Osmolality (mOsm/kg)	549.1 ± 308.9

Table 2. Description of Morbidity and Pregnant Mother's Negative behavior

Variables	Yes	No
Diseases:		
a. Fever	9 (13.4)	58 (86.6)
b. Painful urination, frequent, and less	30 (44.8)	37 (52.2)
c. Yellowish eyes and skin, dark urine	2 (3.0)	65 (97.0)
d. Dizziness, pale, listless, and tiredness	33 (49.3)	34 (50.7)
e. Breathlessness, or shortness of breath	36 (53.7)	31 (46.3)
Pregnant Mother's behavior:		
a. Drinking alcoholic	1 (1.5)	66 (98.5)
b. Taking drug for a special disease	7 (10.4)	60 (89.6)
c. Drinking traditional herbs	3 (4.5)	64 (95.5)
d. Smoking	1 (1.5)	66 (98.5)

Table 3. Bivariate analyses of contribution between nutritional status, hydration status and morbidity

Variables	Morbidity		p-value
	High	Low	
Nutritional Status			
1. MUAC:			NS
a. Chronic Energy Deficiency	22 (36.4)	21 (63.6)	0.518
b. Normal	15 (44.4)	19 (55.9)	RR = 1.15
2. Hemoglobin:			NS
a. Anemic	6 (54.5)	5 (45.5)	0.292
b. Normal	21 (37.5)	35 (62.5)	RR=1.45
Hydration Status			
Urine Osmolality:			NS
a. Dehydration	15 (41.7)	21 (58.3)	0.806
b. Hydration	12 (38.7)	19 (61.3)	RR= 1.07
Mother's Behavior:			NS
a. Less	23 (40.4)	34 (59.6)	0.983
b. Good	4 (40.0)	6 (60.0)	RR=1.01

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# Risk Factors of Morbidity During Pregnancy in West Jakarta, Indonesia

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