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Relationship Between of Protein Level Intake and Perineal Wound Healing

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ABSTRACT

Background: The perineum is at risk of injury either spontaneously or by episiotomy during labor. Perineal wounds usually heal within 6-7 days postpartum. Healing of perineal wounds can be influenced by protein consumption in postpartum mothers. This purpose of this study was to determine the relationship between the levels of protein consumption with the perineal wound healing in postpartum mothers.

Subjects and Method: This cross sectional study conducted at Ciawi Public Health Center, West Java, in September-November 2022. The sample in this study were postpartum mothers who gave birth normally with perineal wounds at Ciawi Public Health Center. Sample selection used a purposive sampling method and the sample size was 67 respondents. The dependent variable was perineal wound healing. The independent variable was the level of protein consumption. The research instrument used a REEDA Scale observation sheet and Food Recall 24 hours questionaire. Data were analyzed using Chi-square test.

Results: Healing of perineal wounds in postpartum mothers was good for 65 respondents (97%), postpartum mothers who had sufficient levels protein consumption levels were 33 respondents (49,3%). The results show that there is no relationship between perineal wound healing and the level of protein consumption (p= 0.197).

Conclusion: There is no relationship between the level of protein consumption with the perineal wound healing

Keywords: protein consumption; perineal wound healing; postpartum mothers.

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BACKGROUND

The perineum is at risk of injury either due to spontaneous tearing or episiotomy during labor. The World Health Organization (WHO) reports that there are 2.7 million cases of perineal wounds in mothers deliveries in the world and it is estimated that this will reach 6.3 million in 2050 (Pemiliana et al., 2019). Based on data from the Ministry of Health of the Republic of

Indonesia in 2013, as many as 57% of mothers received perineal stitches due to episiotomy (28%) and spontaneous tears (29%) (Rohmin et al., 2017).

Perineal wounds healing characterized by the absence of infection, the tissue uniting, and no pain when sitting or walking (Utami, 2017). According to Rustam Mochtar in (Sidabutar, 2015), perineal wounds usually heal within 6 to 7 days postpartum if they are not accompanied by infection. Delays in healing perineal wounds have an impact on increasing the incidence of infection, because the moist condition of the perineum becomes a favorable place for bacteria to breed and considering the physical condition of postpartum mothers who are still weak after giving birth. Complications from perineal infections are urinary tract infections or birth canal infections (Utami and Anwar, 2017).

Based on a study conducted by Sulistianingsih and Wijayanti (2019), the dominant factor inss healing perineal wound is nutrition. Nutritional needs during the postpartum period have increased by 25%, one of which is needed for healing perineal wounds (Demling, 2009; Rosalina and Banun Titi Istiqomah, 2017). The nutrients needed are protein or amino acids, carbohydrates, vitamins, and minerals which function for cellular activity and support the immune system during the wound healing process, so that they can speed up wound healing and prevent infection (Widjianingsih and Wirjatmadi, 2012; Dewi et al., 2016). The problem in the field is that there are still postpartum mothers who abstain from certain foods (such as fish, eggs, chicken liver) which can cause nutritional requirements to decrease, resulting in slow recovery of perineal wounds (Arma et al., 2020).

Protein plays an important role during the wound healing process. Immune system cells are formed and their activities require protein (Wild et al., 2010; Barchitta et al., 2019). These cells are important during the inflammatory phase to prevent infection in perineal wounds (Schultz et al., 2011). A disrupted or prolonged inflammatory phase can cause chronic wounds, impaired healing, and the formation of more scar tissue (Gantwerker and Hom, 2011; Schultz et al., 2011). Protein during the proliferation phase is required for fibroblast activity, angiogenesis, and collagen formation (Barchitta et al., 2019). Protein deficiency can reduce collagen synthesis and fibroblast production so that adequate protein availability is necessary for consistent wound healing (Wild et al., 2010).

In 2022, 407 mothers gave birth at Ciawi Public Health Center and 160 of these mothers received stitches in their perineum due to the trauma childbirth. Ciawi Public Health Center also consist of several ethnic groups, so there are social-cultural differences between each postpartum mothers which may influence the healing of perineal wound healing. Ciawi Public Health Center is located in the southern part of Bogor Regency which is a highland area, so it can influence amount and type of nutritional consumption depending on the availability of various food ingredients in the area. Based on the background above, researchers feel the need and interest in researching “the relationship between the level of protein consumption with perineal wound healing” to find out the relationship between the level of protein consumption with perineal wound healing at Ciawi Public Health Center, Bogor.

SUBJECTS AND METHOD

1. Study Design

This research is a quantitative study using an observational study design and a cross-sectional approach. The location of this research was at Ciawi Public Health Center, West Java, in September-November 2022.

2. Population and Sample

The population in this study were post-partum mothers who gave birth normally with perineal wounds at Ciawi Public Health Center. The sample size in this study was 67 respondents using a purposive sampling technique with inclusion and exclusion criteria.

3. Study Variables

The dependent variable of this study is perineal wound healing. The independent variable is the level of protein consumption.

4. Operational Definition of Variables

Perineal wound healing is the process of replacing and changing the perineal wound can be seen by observing the REEDA sign on the 7th day postpartum and then scoring it using the REEDA Scale. If the score is <3 the perineal wound healing is good and if the score is ≥3 the perineal wound healing is poor.

The level of protein consumption is protein consumption in a day converted into grams taken by interview using food recall 24 hours on the 7th day postpartum, then the level of protein consumption is calculated and interpreted according to the category. The level of protein consumption is less if <90%, sufficient if 110%, and more if >110%.

5. Study Instrument

The instruments used in data collection were REEDA Scale observation sheet to measure perineal wound healing and food recall 24 hours questionnaire to measure the level of protein consumption. Data management techniques include editing, coding, entry, cleaning, and tabulating techniques. REEDA Scale observation sheet has five assessment items (redness, edema, ecchymosis, discharge, and approximation) and food recall 24 hours include the name of the food and the portion of the dish in household size.

6. Data analysis

Data analysis methods used in this study include univariate and bivariate analysis. Univariate analysis to determine the frequency distribution of sample characteristics and bivariate analysis using statistical chi-square test with significance level of 5% coefficient (α= 0.05) to determine the relationship between the level of protein consumption with perineal wound healing.

7. Research Ethics

Research ethics namely with informed consent, anonymity, and confidentiality. A research ethics permit approval letter was obtained from the Health Research Ethics Committee of Universitas Airlangga School of Medicine Surabaya, Indonesia, No. 154/EC/KEPK/FKUA/2022, on August 08, 2022.

RESULTS

1. Sample Characteristics

Table 1 show that the majority of the subject in this study were aged 20-35 years totaled 60 (89.5%) postpartum mothers. 29 (43.2%) postpartum mothers had a junior high school education and 66 (98.5%) postpartum mothers worked as housewives. All of the subject are Sundanese. Most of the subject had low parity (<3 deliveries) as many as 45 (67.2%) postpartum mothers. Most of the subject did not consume medication/ herbal medicine totaled 61 (91%) people and 49 (73.1%) postpartum mothers had no restrictions during the postpartum period. Some of the subject had a normal body mass index with a total of 47 (70.1%)

people. All of the subject changed sanitary napkins ≥2 times a day.

Table 1. The frequency distribution of sample characteristics

Characteristics Subject	Category	Frequency	Percentage (%)
Age	<20 years	2	3
	20-35 years	60	89.5
	≥36 years	5	7.5
Education	Elementary School	20	29.9
	Junior High School	29	43.2
	Senior High School	18	26.9
	Bachelor	0	0
Occupation	Housewife	66	98.5
	Work	1	1.5
Parity	≥3	22	32.8
	<3	45	67.2
Ethnic	Sundanese	67	100
History of taking drugs/ oral medicine	No	61	91
	Yes	6	9
Postpartum restrictions	No	49	73.1
	Yes	18	26.9
Change sanitary napkins	≥2	67	100
Body Mass Index	Normal	47	70.1
	Overweight	10	14.9
	Obesity	10	14.9

Table 2 show that from 67 total subjects in this study, as many as 65 (97%) postpartum mothers perineal wound healing was good. Meanwhile the other 2 people (3%) had poor perineal wound healing. A total of 67 postpartum mothers, 33 (49.3%) people had moderate level of protein consumption. As many as 26 (38.8%) postpartum mothers level of protein consumption was less, and 8 (11.9%) postpartum mothers level of protein consumption was over.

Table 2. Univariate Analysis

Characteristics Subject	Category	Frequency	Percentage (%)
Perineal wound healing	Good	65	97
	Poor	2	3
The level of protein consumption	Less	26	38.8
	Moderate	33	49.3
	Over	8	11.9

2. Bivariate Analysis

Table 3 shows that 33 postpartum mothers with moderate levels of protein consumption had good perineal wound healing. Meanwhile, 2 postpartum mothers who had less levels of protein consumption had poor perineal wound healing. The research results were analyzed using the chi-square tes in the SPSS Statistics 22 application. Based on the chi-square test result, it was found that the p-value was 0.197 (>0.05), which means that there is no relationship between the level of protein consumption with perineal wound healing.

Table 3. Relationship between the level of protein consumption and perineal wound healing (an analysis by chi-square)

Variable		The level of protein consumption		Total	p
		Less	Moderate - high		
Perineal wound healing	Good	24	43	65	0.197
	Poor	2	0	2	

DISCUSSION

The relationship between the level of protein consumption with perineal wound healing

Based on the test results, it was found that the p-value was 0.197 (>0.05), which means that there is no relationship between the level of protein consumption with perineal wound healing. The results of this study are not in line with research conducted by (Sulistianingsih and Wijayanti, 2019), which state that dominant factor in healing perineal wound is nutrition. Likewise, research by (Darmawati and Sastra, 2013) states that there is a relationship between nutrition and the length of healing of perineal wounds. The nutritiens needed are protein or amino acids, carbohydrates, vitamins, and minerals which function for cellular activity and support the immune system during wound healing and prevent infection (Wild et al., 2010; Widjianingsih and Wirjatmadi, 2012; Dewi et al., 2016). In the research, it was still found that the level of protein consumption of respondent was low, namely 26 (38.8%). This can be caused by dietary restrictions such as not eating eggs, meet, or fish because the thought that it can prolonged the heal of perineal wounds. Based on research conducted by (Marcelina and Nisa, 2018) that 24% of 38 respondent had food restrictions due to beliefs or myths from surrounding culture. The results of research conducted by (Arma et al., 2020) also found that there was a significant relationship between dietary restrictions and perineal wound healing, where in results of this study, postpartum mothers who abstained from food had slower healing of perineal wounds.

Apart from that, based on research conducted by (Muniroh, 2019) that there is a relationship between diet and the healing process of episiotomy wounds. The results of the research found that the respondent had a balanced diet, namely not eating certain foods. The recommended diet consists of balanced nutrition, namely 60-70% carbohydrates, 15-20% protein, 20-30% fat, accompanied by sufficient vitamins, mineral, and fiber. This balanced nutrition greatly influences the process of wound healing and tissue replacement. This is also in line with research conducted by (Maghfirah and Halimatussakdiah, 2022) that there is a relationship between eating patterns and behaviour, culture and acknowledge of postpartum mothers and the length of healing of episiotomy wounds. Research conducted by (Widjianingsih and Wirjatmadi, 2012) also found that there was a significant relationship between the level of nutritional consumption of respondent and wound healing after cesarean section surgery. Based on research results, it is known that postnatal mothers who have good levels of nutritional intake can go through the wound healing process perfectly. However, in this study, the level of protein consumption was only taken once, namely on 7th day of postpartum, possibly still not being able to describe the respondent eating pattern during the perineal wound healing process.

Good healing of perineal wounds in respondents could occur due to other

perineal wound healing factors, namely good nutritional status. This can be seen from body mass index of respondents where the majority have a normal body mass index total 47 (70.1%) postpartum mothers. This is line with research conducted by (Sinaga et al., 2022) that there is a relationship between the nutritional status of postpartum mothers and the recovery of perineal wounds. Likewise, research conducted by (Zuhana et al., 2017) stated that the research results showed there was a relationship between body mass index and healing of perineal wounds in postpartum mothers.

Maternal nutritional status can also influence perineal wound healing. The mother's nutritional status is assessed from the time of pregnancy until the current postpartum period. The mother's nutritional status is an indication of the mother's nutritional history. An adequate and balanced supply of necessary nutrients, including carbohydrates, proteins, fat and micronutrients, such as vitamins, zinc, magnesium is beneficial for wound healing (Ghaly et al., 2021). Nutrient deficiencies can alter the inflammatory response, collagen synthesis, and tensile strength of wounds, all of them are important for wound healing. To determine the mother previous nutritional adequacy, it is necessary to know the mother previous nutritional history (Herberger et al., 2020). In this study, nutritional status of the respondents was not previously assessed so that can the relationship between past nutritional history and perineal wound healing cannot be known.

Apart from nutritional status, good healing of perineal wounds can also caused by the respondent personal hygiene. Based on the research results, the form of personal hygiene carried out by respondent is by changing sanitary napkins. The research results show that all respondents changed their sanitary napkins >2 times a day. Changing sanitary napkins aims to ensure that the genital outside the vagina and the surrounding area, especially the perineum, remain clean and comfortable, as well as preventing conditions that cause infection in the perineal wound (Timbawa et al., 2015). The moist condition of the perineum exposed to loccheal fluid can encourage the growth of bacteria which results in inhibiting the wound healing process (Trisnawati, 2015). This is supported by research conducted by (Triyani et al., 2021) which shows that there is a relationship between personal hygiene and the healing prsocess of perineal wounds. This research is in line with research conducted by (Lestari et al., 2022) showing that there is a significant relationship between personal hygiene and perineal wound care in the Belida Darat Public Health Center in 2021.

The absence of a relationship between the level of protein consumption and perineal wound healing in this study could also be due to the weakness of the food recall 24 hours method. The food recall 24 hours method is a method of remembering food consumed in the last 24 hours period and recorded in the household size (URT) (Sirajuddin, Surmita and Astuti, 2018). According to (Fayasari, 2020), food recall 24 hours method which is carried out in just one day cannot describe daily food intake. In this study, food recall 24 hours was carried out once, namely on 7th day postpartum only. Food recall 24 hours method is the most widely used consumption survey method because this method is quite accurate, its implementation is fast, cheap, easy and does not require expensive equipment. However, food recall 24 hours method also relies on the respondent memory and also requires expertise in

exploring all the food and drinks consumed by respondent along with the household size (URT) (Sembiring et al., 2015).

Based on the discussion of research results, it can be concluded that not only the level of protein consumption can influence the perineal wound healing, but there is other factors, namely a balanced nutritional diet, nutritional status of postpartum mothers, proper personal hygiene, mother's age, education, occupation, parity, social and cultural aspects of postpartum mothers.

AUTHORS CONTRIBUTION

In this research, Nindi Indrianingrattu and Widati Fatmaningrum collaborated to create a conceptual framework and research methodology. Nindi Indrianingrattu collects data. Nindi Indrianingrattu, Widati Fatmaningrum, and Dewi Setyowati collaborated to analyze the data.

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CONFLICT OF INTEREST

There is no conflict of interest in this study.

REFERENCES

Arma N, Sipayung NA, Syari M, Ramini N (2020). Pantang makanan terhadap lamanya penyembuhan luka perineum pada ibu nifas (Food abstinence on the length of healing of perineal wounds in postpartum mothers). JIK Jurnal Ilmu Kesehatan. 4(2): 95-100. doi: 10.33757/jik.v4i2.292.

Barchitta M, Maugeri A, Favara G, Magnano San Lio R, Evola G, Agodi A, Basile G (2019). Nutrition and Wound Healing: An Overview Focusing on the Beneficial Effects of Curcumin. Int J Mol Sci. 20(5):1119. doi: 10.3390/-ijms20051119.

Darmawati, Sastra I (2013). Hubungan faktor-faktor yang mempengaruhi penyembuhan luka dengan lama penyembuhan luka perineum ibu nifas (The relationship between factors that influence wound healing and the duration of perineal wound healing in postpartum mothers). Idea Nursing Journal. 4(3): 41–51. Available at: http://jurnal.unsyiah.ac.id/-INJ/article/download/1678/1583.

Demling RH (2009). Nutrition, anabolism, and the wound healing process: an overview. Eplasty, 9, p. e9. Available at: http://www.ncbi.nlm.nih.gov/-pubmed/19274069 (Accessed: 11 December 2020).

Dewi SS, Soemardini S, Nugroho FA (2016). Hubungan tingkat konsumsi protein, zat besi (Fe) dan Zinc (Zn) dengan kondisi penyembuhan luka perineum derajat ii pada ibu nifas (The relationship between the level of protein, iron (Fe) and zinc (Zn) consumption and the healing condition of grade II perineal wounds in postpartum mothers). Majalah Kesehatan. 3(3): 137-143. https://majalah-fk.ub.ac.id/index.php/mkfkub/article/view/102

Fayasari A (2020) Penilaian konsumsi pangan (Food consumption assessment). 1st edn. Edited by T. K. Fayakun. Jombang: Kun Fayakun.

Gantwerker EA, Hom DB (2011). Skin: histology and physiology of wound healing. Facial Plast Surg Clin North

Am. 19(3):441-53. doi: 10.1016/j.fsc.-2011.06.009.

Ghaly P, Iliopoulos J, Ahmad M (2021). The role of nutrition in wound healing: an overview. Br J Nurs. 30(5): S38-S42. doi: 10.12968/bjon.2021.-30.5.S38.

Herberger K, Müller K, Protz K, Zyriax BC, Augustin M, Hagenström K (2020). Nutritional status and quality of nutrition in chronic wound patients. Int Wound J. 17(5):1246-1254. doi: 10.1111/iwj.13378.

Jamila F, Anwar YY (2017). Pengaruh pemberian jus nanas dan madu terhadap penyembuhan luka perineum pada ibu post-partum di Bpm Ny.Arifin S, SST Surabaya (The effect of giving pineapple juice and honey on healing perineal wounds in postpartum mothers at Bpm Ny. Arifin S, SST Surabaya). Repository Stikes Surabaya, 7: 5–12.

Lestari PT, Ismed S, Afrika E (2022). Hubungan antara pengetahuan, dukungan keluarga dan personal hygiene dengan perawatan luka perineum masa nifas di Wilayah Kerja Puskesmas Belida Darat Kecamatan Darat Kabupaten Muara Enim Tahun 2021 (The relationship between knowledge, family support, and personal hygiene with perineal wound care during postpartum in the Belida Darat Community Health Center Work Area, Darat District, Muara Enim Regency in 2021). Jurnal Ilmiah Universitas Batanghari Jambi, 22(1): 314. doi: 10.33087/jiubj.v22i1.1842.

Maghfirah N, Halimatussakdiah (2022). Bagaimanakah pola dan perilaku makan, budaya pantangan dan pengetahuan berpengaruh pada penyembuhan luka episiotomi? (How do eating patterns and behavior, cultural taboos and knowledge influence the healing of episiotomy wounds?). Jurnal Keperawatan. 4(2): 547–556. Available at: http://journal.stikes-kendal.ac.id/index.php/Keperawatan.

Marcelina RF, Nisa F (2018). Hubungan antara pantang makanan dengan penyembuhan luka perineum di Ruang Mawar RSI Jemursari Surabaya (The relationship between food abstinence and perineal wound healing in the Mawar Room, Jemursari Islamic Hospital, Surabaya). The Indonesian Journal of Health Science. 10(2): 101–109. doi: 10.32528/IJHS.-V10I2.1862.

Muniroh S (2019). Hubungan pola makan dengan proses penyembuhan luka episiotomy (The relationship between diet and the healing process of episiotomy wounds). Jurnal Keperawatan. 8(1): 47–51. doi: 10.47560/-kep.v8i1.90.

Pemiliana PD, Sarumpaet IH, Ziliwu S (2019). Faktor - faktor yang berhubungan dengan ruptur perineum pada persalinan normal di Klinik Niar Medan (Factors associated with perineal rupture in normal delivery at Niar Clinic Medan). Jurnal Kesehatan, 2(2): 170–182. https://doi.org/-10.33096/woh.v2i2.623

Rohmin A, Octariani B, Jania M (2017). Faktor risiko yang mempengaruhi lama penyembuhan luka perineum pada ibu post partum (Risk factors that influence the duration of perineal wound healing in postpartum mothers). Jurnal Kesehatan. 8(3): 449. doi: 10.26630/jk.v8i3.660.

Rosalina S, Istiqomah SBT (2017). Hubungan asupan kalori dan protein ibu nifas dengan lama penyembuhan luka perineum di Puskesmas Balowerti Kota Kediri Indonesia (The

relationship between calorie and protein intake of postpartum mothers and the duration of perineal wound healing at the Balowerti Community Health Center, Kediri City, Indonesia). Jurnal EDUMidwifery, 1(2): 2017. Available at: https://journal.-unipdu.ac.id/index.php/edumidwifery/article/view/1060

Schultz GS, Chin GA, Moldawer L, Diegelmann RF (2011). Principles of wound healing, in Mechanisms of Vascular Disease: A Reference Book for Vascular Specialists. Adelaide (AU): University of Adelaide Press: 423–450. doi: 10.1017/UPO978192-2064004.024.

Sembiring AC, Briawan D, Baliwati YF (2015). Metode skor konsumsi pangan untuk menilai ketahanan pangan rumah tangga (Food consumption scoring method to assess household food security). Penelitian Gizi dan Makanan. 38(1): 31–40. Available at: https://media.neliti.-com/media/publications-test/223-561-metode-skor-konsumsi-pangan-untuk-menila-bd629f1a.pdf (Accessed: 30 January 2024).

Sidabutar S (2015). Usia dan budaya pantang makanan mempengaruhi penyembuhan luka perineum pada ibu nifas hari ke 7 (Age and cultural food taboos influence perineal wound healing in postpartum mothers on day 7). Journal of Health Sciences. 6(2). doi: 10.33086/jhs.v6i2.36.

Sinaga R, Sinaga K, Simanjuntak P, Damanik NS (2022). Hubungan status gizi ibu nifas dengan penyembuhan luka perineum (The relationship between the nutritional status of postpartum mothers and the healing of perineal wounds). Indonesian Health Issue. 1(1): 69–75. doi: 10.47134/inhis.v1i1.-13.

Sirajuddin, Surmita, Astuti T (2018). Survey konsumsi pangan (Food consumption survey).

Sulistianingsih A, Wijayanti Y (2019). Faktor yang berpengaruh terhadap penyembuhan luka perineum pada ibu postpartum. Journal for Quality in Women's Health. 2(1): 11–18. Available at: https://jqwh.org/index.-php/JQWH/article/view/22

Timbawa S, Kundre R, Bataha Y (2015). Hubungan vulva hygiene dengan pencegahan infeksi luka perineum pada ibu post partum di Rumah Sakit Pancaran Kasih GMIM Manado (The relationship between vulva hygiene and the prevention of perineal wound infections in postpartum mothers at Pancaran Kasih Hospital GMIM Manado). E-Journal Keperawatan. 3(2): 2–6.

Trisnawati (2015). Faktor-faktor yang berhubungan dengan penyembuhan luka jahitan perineum pada ibu nifas di Puskesmas Mergangsan Yogyakarta Tahun 2015 (Factors related to the healing of perineal suture wounds in postpartum mothers at the Mergangsan Community Health Center, Yogyakarta in 2015). Daerah Istimewa Yogyakarta: Universitas Aisyiyah Yogyakarta.

Triyani Y, Wittiarika ID, Hardianto G (2021). Factors influencing the process of perineal wound healing in postpartum women in Serui Hospital, Papua. Indonesian Midwifery and Health Sciences Journal. 5(4): 398–405. doi: 10.20473/imhsj.v5i4.2021.-398-405.

Utami, B. A. F. (2017) Perbedaan waktu penyembuhan luka perineum pada ibu post partum antara perawatan dengan Nacl 0,9% dan air DTT di

Puskesmas Jetis Kota Yogyakarta. Universitas 'Aisyiyah Yogyakarta.

Widjianingsih E, Wirjatmadi B (2012). Hubungan tingkat konsumsi gizi dengan proses penyembuhan luka pasca operasi sectio cesarea (The relationship between nutritional consumption levels and the wound healing process after cesarean section surgery). Media Gizi Indonesia. 9:1–5.

Wild T, Rahbarnia A, Kellner M, Sobotka L, Eberlein T (2010). Basics in nutrition and wound healing. Nutrition. 26(9): 862-6. doi: 10.1016/j.nut.2010.05.008.

Zuhana N, Prafitri LD, Ersila W (2017). Indeks masa tubuh terhadap penyembuhan luka perineum ibu nifas (Body mass index on perineal wound healing in postpartum mothers). Jurnal Ilmiah Kesehatan, 10(2). doi: 10.48-144/jiks.v10i2.78.