



REPUBLIK INDONESIA  
KEMENTERIAN HUKUM DAN HAK ASASI MANUSIA

# SURAT PENCATATAN CIPTAAN

Dalam rangka perlindungan ciptaan di bidang ilmu pengetahuan, seni dan sastra berdasarkan Undang-Undang Nomor 28 Tahun 2014 tentang Hak Cipta, dengan ini menerangkan:

Nomor dan tanggal permohonan : EC00201977312, 22 Oktober 2019

## Pencipta

Nama : Ade Devriany, M.Kes  
Alamat : Komp. BTN Wesabbe Blok D.31 RT. 004 / RW.005, Kel.  
Tamalanrea Kecamatan Tamalanrea, Makassar, Sulawesi Selatan,  
90245  
Kewarganegaraan : Indonesia

## Pemegang Hak Cipta

Nama : Ade Devriany, M.Kes  
Alamat : Komp. BTN Wesabbe Blok D.31 RT. 004 / RW.005, Kel.  
Tamalanrea Kecamatan Tamalanrea, Makassar, Sulawesi Selatan,  
90245  
Kewarganegaraan : Indonesia  
Jenis Ciptaan : Karya Rekaman Video  
Judul Ciptaan : Video Pembuatan Ekstrak Minyak Kelapa Hijau (Virgin Green  
Coconut Oil)  
Tanggal dan tempat diumumkan untuk pertama kali di wilayah Indonesia atau di luar wilayah  
Indonesia : 14 Juni 2019, di Pangkalpinang  
Jangka waktu perlindungan : Berlaku selama 50 (lima puluh) tahun sejak Ciptaan tersebut  
pertama kali dilakukan Pengumuman.  
Nomor pencatatan : 000160291

adalah benar berdasarkan keterangan yang diberikan oleh Pemohon.

Surat Pencatatan Hak Cipta atau produk Hak terkait ini sesuai dengan Pasal 72 Undang-Undang Nomor 28 Tahun 2014 tentang Hak Cipta.



a.n. MENTERI HUKUM DAN HAK ASASI MANUSIA  
DIREKTUR JENDERAL KEKAYAAN INTELEKTUAL

Dr. Freddy Harris, S.H., LL.M., ACCS.  
NIP. 196611181994031001

## LEMBAR HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW* KARYA ILMIAH: HAK CIPTA

Judul Hak Cipta : *Video Pembuatan Ekstrak Minyak Kelapa Hijau (Virgin Green Coconut Oil)*

Jumlah Pembuat Karya : 1 orang

Nama Penulis : Ade Devriany

Status Penulis : Pengusul Tunggal/Pengusul pertama/pengusul ke-2/penulis korespondensi

Identitas Paten : a. Jenis : Karya Rekaman Video  
b. Nomor Permohonan : EC00201977312  
c. Nomor Pencatatan : 000160291  
d. Tahun, tempat terbit : 22 Oktober 2019, Pangkalpinang  
e. Pemberi Sertifikat : Kementerian Hukum dan Hak Asasi Manusia Republik Indonesia  
f. Alamat web hak cipta : <http://repository.poltekkespa ngkalpinang.ac.id/setiadi/js/pdfjs/web/viewer.html?file=../../reposit ory/HKI%20Video%20VCO.pdf>

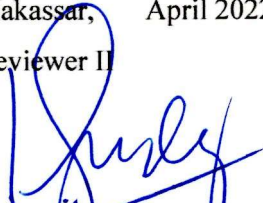
Kategori HaKI/Paten : ☐ Patent Granted  
☐ Pendaftaran Paten  
☒ Hak Cipta

Hasil Penilaian *Peer Review*:

Komponen Yang Dinilai	Nilai Maksimal Hak Cipta		Nilai Akhir Yang Diperoleh
	Internasional <input type="checkbox"/>	Nasional <input checked="" type="checkbox"/>	
a) Kelengkapan unsur isi hak cipta (10%)		1,5	1,3
b) Ruang lingkup dan kedalaman (30%)		4,5	4,2
c) Kecukupan dan kemutakhiran data/ informasi dan metodologi (30%)		4,5	4,3
d) Kelengkapan unsur dan kualitas (30%)		4,5	4,2
<b>Total = (100%)</b>		15,0	14,0

Makassar, April 2022

Reviewer II

  
Dr. Rudy Hartono, SKM., M.Kes  
NIP. : 197006131998031002  
Jabatan Fungsional : Lektor Kepala  
Jenjang Akademik : S3  
Unit Kerja : Jurusan Gizi, Poltekkes Makassar

Unit Kerja : Jurusan Gizi, Poltekkes Makassar

Komentar Reviewer :

1. Tentang kelengkapan dan kesesuaian unsur  
Video dibuat berdasarkan sistematis, menggunakan  
kamus yg memadai & format hasil gambar & suara
2. Tentang ruang lingkup dan kedalaman pembahasan  
Pembahasan tt. pembuatan poster untuk kelapn hijrah yg diawali  
dng proses pembuatan kelapn hijrah yg diidentifikasi untuk
3. Kecukupan dan kemutakhiran data/informasi dan metodologi  
Metodologi yg digunakan dg penemuan yg mendidik untuk  
kelapn hijrah
4. Kelengkapan unsur dan kualitas terbitan  
Video yg dikampanye memuat unsur-2 terkait dengan kualitas  
yg cukup
5. Indikasi Plagiat  
Tidak ada cara penulisan untuk kelapn hijrah, tetapi ada yg  
menggunakan cara lain dg dasar tpt penulisan (local wisdom).
6. Kesesuaian Bidang ilmu  
bidang ilmu sains dg penulisan video yg penulisan untuk

Makassar, April 2022

Reviewer II

  
Dr. Rudy Hartono, SKM., M.Kes

NIP : 197006131998031002

Jabatan Fungsional : Lektor Kepala

Jenjang Akademik : S3

Unit Kerja : Jurusan Gizi, Poltekkes Makassar

**LEMBAR HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*  
KARYA ILMIAH: HAK CIPTA**

Judul Hak Cipta : *Video Pembuatan Ekstrak Minyak Kelapa Hijau (Virgin Green Coconut Oil)*  
 Jumlah Pembuat Karya : 1 orang  
 Nama Penulis : Ade Devriany  
 Status Penulis : Pengusul Tunggal/Pengusul pertama/pengusul ke-2/penulis korespondensi  
 Identitas Paten : a. Jenis : Karya Rekaman Video  
 b. Nomor Permohonan : EC00201977312  
 c. Nomor Pencatatan : 000160291  
 d. Tahun, tempat terbit : 22 Oktober 2019, Pangkalpinang  
 e. Pemberi Sertifikat : Kementerian Hukum dan Hak Asasi Manusia Republik Indonesia  
 f. Alamat web hak cipta : <http://repository.poltekkespangkalpinang.ac.id/setiadi/js/pdfs/web/viewer.html?file=../../repository/HKI%20Video%20VCO.pdf>

Kategori HaKI/Paten : ☐ Patent Granted  
☐ Pendaftaran Paten  
☒ Hak Cipta

Hasil Penilaian *Peer Review*:

Komponen Yang Dinilai	Nilai Maksimal Hak Cipta		Nilai Akhir Yang Diperoleh
	Internasional <input type="checkbox"/>	Nasional (5) <input checked="" type="checkbox"/>	
a) Kelengkapan unsur isi hak cipta (10%)		0.5	0,4
b) Ruang lingkup dan kedalaman (30%)		1,5	1,5
c) Kecukupan dan kemutakhiran data/ informasi dan metodologi (30%)		1.5	1,3
d) Kelengkapan unsur dan kualitas (30%)		1.5	1,5
<b>Total = (100%)</b>		5	4,7

Yogyakarta, April 2022

Reviewer II



Setyowati, SKM., M.Kes  
 NIP : 196406211988032002  
 Jabatan Fungsional : Lektor Kepala  
 Jenjang Akademik : S2  
 Unit Kerja : Jurusan Gizi, Poltekkes Yogyakarta

Komentar Reviewer :

1. Tentang kelengkapan dan kesesuaian unsur isi  
Kelengkapan unsur isi sudah sesuai sistematis yang diminta
2. Ruang lingkup dan kedalaman  
Ruang lingkup sudah sesuai bidang ilmu kedalaman pembahasan baik
3. Kecukupan dan kemutakhiran data serta metodologi  
Video memuat cukup data/informasi, perlu ditambahkan rujukan pada akhir tayangan.
4. Kelengkapan unsur kualitas  
Video bersih/memuat tayangan yg lengkap dan awal bahan baku sampai jadi VCO.
5. Indikasi plagiasi  
Tidak ditemukan. Indikasi plagiat
6. Kesesuaian bidang ilmu  
Sangat sesuai

Yogyakarta, April 2022

Reviewer II



Setyowati, SKM., M.Kes

NIP : 196406211988032002

Jabatan Fungsional : Lektor Kepala

Jenjang Akademik : S2

Unit Kerja : Jurusan Gizi, Poltekkes Yogyakarta

## **The Effect of Back Rolling Massage Method With Green Coconut Oil Extract Towards Breastmilk Production on Post Partum Mother in Pangkalpinang City, Indonesia**

**Ade DEVRIANY\*<sup>1</sup>; Emmy KARDINASARI<sup>1</sup>; HARINDRA<sup>2</sup>; BOHARI<sup>3</sup>**

<sup>1</sup>Nutrition, Health Polytechnic of the Ministry of Health Pangkalpinang, Pangkalpinang City, Indonesia

<sup>2</sup>Midwifery, Health Polytechnic of the Ministry of Health Pangkalpinang, Pangkalpinang City, Indonesia

<sup>3</sup>Nutrition, Faculty of Public Health, Tadulako University, Palu City, Indonesia

Corresponding author's e-mail: [adedevriany@gmail.com](mailto:adedevriany@gmail.com)

Received: xxx, Revised: xxx, Accepted: xxx (Times New Roman, 10 pt, Italic)

### **Running title**

The Effect of Back Rolling Massage and Breastmilk Production on Post Partum Mother

### **Abstract**

To identify the effect of back rolling massage with green coconut oil extract towards breastmilk production on postpartum mother. The type of this research was Quasi-Experimental Research with Static-Group Comparison. The intervention group was the mothers that were given back rolling massage with green coconut oil extract. The control group was postpartum mothers that were given back rolling massage without green coconut oil extract. The samples in this research were 24 samples consisted of 2 sample groups such as 12 samples in the intervention group and 12 samples in the control group. The average breastmilk production of the group with VCO extract in day 4 is 46,9 ml while the group without VCO extract is 42,9% until it shows no significant difference towards breastmilk production on day 4 with p-value = 0,794. On day 7 shows that the VCO extract group has breastmilk production 87,3 ml compared to the group without VCO only 49,2 ml until there is a significant difference with p-value = 0,046. The antioxidant analysis shows that VCO extract contained alkaloids and saponin. Back rolling massage with green coconut oil extract is effective in increasing breastmilk production at day 7.

**Keywords:** back rolling massage, green coconut oil extract, VCO, mother breastmilk

### **Introduction**

Breast Milk (ASI) is the best food for growing and developing for babies. In addition to the complete nutritional content of breast milk, the baby will get a comprehensive sensory stimulation (tactile, smell, hearing, warmth and affection) from his mother [1]. Coverage of exclusive breastfeeding around the world is only around 36% during the 2007-2016 period. Meanwhile, coverage of exclusive breastfeeding in Indonesia was 54.3% in 2016. The duration of exclusive breastfeeding for infants had not been reached 6 months and only lasts for 2 months[2]. Many things cause the failure of exclusive breastfeeding, one of which is the lack of confidence in mothers who feel that the milk they have cannot meet the nutritional needs of their babies [3].

In conditions that are full of worry and lack of confidence because they feel that their milk cannot meet their baby's needs, the mother needs help and support to be able to maintain milk production. This is because due to lack of confidence and anxiety will cause inhibition of the hormone oxytocin. This oxytocin hormone has an impact on the release of the hormone prolactin as a hormone stimulating milk production in mothers during breastfeeding. Various alternatives can be done to increase milk production in mothers

giving birth. Some research results reveal that in addition to consuming foods that are high in protein, one of the efforts that can be done to increase milk production is by doing massage to stimulate the hormone prolactin and oxytocin in the mother [4].

Various alternatives can be done to increase milk production in mothers who have just given birth. Some research results reveal that in addition to consuming foods that are high in protein, one of the efforts that can be done to increase milk production is by doing massage to stimulate the hormone prolactin and oxytocin in the mother. Badrus research results (2018) which provide *woolwich massage* and *back rolling massage* prove to be able to produce increased milk production in mothers. There are 80% of mothers who experience increased milk production after being given back rolling massage and 60% of mothers who have increased milk production after being given a *Woolwich massage* [5]. From Desmawati's research (2008), it was found that postpartum mothers who were treated with a combination intervention of areola massage and *back rolling massage* had 5.146 times the opportunity to express breastmilk less than 12 hours postpartum [6].

In addition to using the *back rolling massage* method to increase breastmilk expenditure, the combination of the back rolling massage method with *Virgin Coconut Oil* (VCO) is thought to further increase milk production and expenditure. VCO is known to have natural antioxidant potential and can increase the ability of the body's defense system against oxidative stress. Coconut oil is the main source of lauric fatty acids [7] and is a component of fatty acids in breast milk. The wealth of fatty acid components in VCO makes this oil capable of being a basic ingredient for the production of fatty acids similar to breast milk [8].

This study aims to identify phytochemical compounds and antioxidant activity from extracts of green coconut oil (*Cocos nucifera*) used in *back rolling massage* in post partum mothers. In addition, the study also aimed to analyze the effect of the *back rolling massage* method by using green coconut oil extract on breast milk production in post-partum mothers in Pangkalpinang City.

## Materials and methods

This research is a Quasi Experimental study with a Static-Group Comparison research design. The variable to be examined is the Effect of *Back Rolling Massage* with Green Coconut Oil Extract on Breast Milk Production in Postpartum Mothers. The intervention group was mothers who were given back rolling massage with green coconut oil extract on the first day of post partum to day 3, then milk production would be measured on days 4 and 7. The control group was post partum mothers who were given *back rolling massage* without extract green coconut oil, where observations of breast milk expenditure will be made on days 4 and 7. The sample size in this study is 24 samples consisting of 2 sample groups, namely 12 samples in the intervention group and 12 samples in the observation group.

The intervention of *back rolling massage* with extracts of green coconut oil (*Cocos nucifera*) in the intervention group was carried out twice a day for 3 days, while the control group was only given the intervention of back rolling massage with olive oil for 3 days. Mothers will be given back rolling massage by skilled workers who have been certified as *Certified Baby and Mom Therapist* (CBMT). Measurement of the volume of milk production on the fourth and seventh day is done through the removal of breast milk using an electric breast pump in the group of mothers who are given intervention and control groups. Analysis of the data in this study is to use statistical tests T-test for normally distributed data and Mann Whitney test for data that are not normally distributed

## Results and discussion

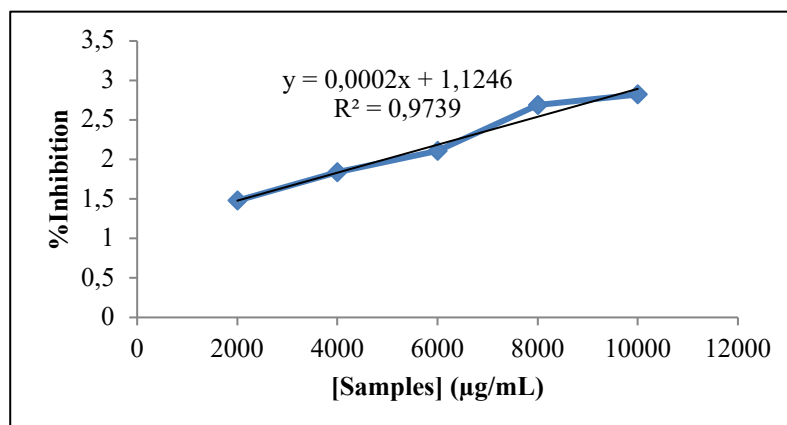
### Phytochemical Identification of VCO Extract from Green Coconut Fruit.

Table 1 shows that the VCO produced by green coconut used contains alkaloids and saponins. Meanwhile, other bioactive compounds such as flavonoids, phenols or tannins, and steroids or terpenoids were not found positive test results. The tests used in this test were three times, indicated by 3 test tubes in each test.

**Table 1. Phytochemicals Identification VCO Extract from Green Coconut Fruit**

Type of Phytochemicals Compound	Result
Alkaloids	+
Phenol/Tanin	-
Flavonoid	-
Saponin	+
Steroid/Terpenoid	-

#### Antioxidant Activity Test of VCO Extract from Green Coconut Fruit.



**Figure 1. The Test of Antioxidant Activity of VCO Extract from Green Coconut Fruit**

Antioxidant activity tends to increase with the addition of VCO concentrations. It's just that the inhibitory activity that occurs is not significantly able to inhibit the work of DPPH. The VCO used in this study was the VCO extracted by the heating method (Figure 1).

#### Breast Milk Production in Post Partum Mother in Pangkal Pinang City.

Table 2 shows that there was no effect of *back rolling massage* with green coconut extract (*Cocos nucifera*) on the production of breast milk on the 4th day in post partum mothers, as indicated by  $p > 0.05$  ( $p = 0.794$ ). Meanwhile on the 7th day, there was a significant difference in the production of breast milk with a value of  $p < 0.05$  ( $p = 0.046$ ) where mothers who received VCO extract during the treatment had greater milk production, which was 87.3 ml.

**Table 2. Breastmilk Production on Post Partum Mother in Pangkalpinang City**

Variable	Breastmilk Production (in ml/day)			p Value
	N	Mean	SD	
Day 4				
With VCO Extract	12	46,9	26,8	0,794*
Without VCO Extract	12	42,9	39,3	
Day 7				
With VCO Extract	12	87,3	51,5	0,046**
Without VCO Extract	12	49,2	35,3	

#### Description:

\* p-value used Mann Whitney test

\*\* p-value used t-independent test

Breast milk production increased significantly in respondents who were massaged using VCO compared to non-VCO. Differences in postpartum maternal milk production in the experimental and control groups can occur due to factors from the mother that can affect milk production. Decreased milk production

in postpartum mothers in the control group can be caused by factors in the mother herself such as fatigue, mental calm and mind. To produce good milk, the mental condition and mind of the mother must also be calm [9]. Psychological conditions of mothers who are depressed, sad, and tense can inhibit the work of oxytocin so that it can affect the mother's milk production [10].

On the 7th day, based on the results of the t-independence test analysis, obtained  $p\text{-value} = 0.046$  ( $p\text{-value} < 0.05$ ) so that it can be concluded that there is an influence that the *Back Rolling Massage* method with green coconut oil extracts on breast milk production in mothers post partum in the City of Pangkalpinang. In line with other studies, this study also showed that there was a significant influence on the administration of back rolling massage and woolwich massage on the excretion of breast milk with a  $p$  value of 0.005 ( $< 0.05$ ) [11]. Other results show that there is a relationship between back massage and breast milk production in post partum mothers ( $p\text{-value} = 0.026$ ,  $p\text{-value} < 0.05$ ) [12].

*Back rolling massage* is one solution to overcome the smooth production of breast milk. *Back rolling massage* is massage along the spine (*vertebrae*) to the fifth-sixth costae bone and is an attempt to stimulate the hormone prolactin and oxytocin after giving birth. *Back rolling massage* is done to stimulate the let down reflex [13]. *Back rolling massage* is an action that can affect the prolactin hormone which functions as a stimulus for breast milk production in mothers during breastfeeding. This action can also relax the mother and facilitate the flow of nerves and breast milk in both breasts [14]. From a study conducted by Desmawati (2008), it was found that postpartum mothers who were given a combination intervention of areola massage with *back rolling massage* had a 5.146 times chance of expending their milk with less than 12 hours postpartum [6]. Potential alkaloids as anti-inflammatory agents can be used as a basis for VCO applications in *back rolling massage* therapy. Coconut oil has been consumed almost in all over Indonesia and is a safe food raw material to be consumed. The green coconut fruit itself is known of owning various phytochemical compound either in its skin, shell, and the fruit flesh tends to have the potency of beneficial phytochemical content for human [15].

Beside alkaloid, another phytochemical component that can be found in VCO extraction result is saponin. The group of this phytochemical compound has important function as anti bacterial component and anti-fungi or mushroom [16]. Saponin has bitter taste which is the key of its protective function towards microorganism that harms human [17]. The presence of this component in VCO can give benefits if applied as topical oil for therapy of back rolling massage

## Conclusions

The average of breastmilk production at day 4 until day 7 experiences increase. VCO usage in back rolling massage produces more average breastmilk production at the 4 in the amount of 46,7 ml. VCO usage in back rolling massage produces more average breastmilk production at day 7 in the amount of 87,3 ml. Back rolling massage method with green coconut oil extract (*Cocos nucifera*) is effective in increasing breastmilk production at day 7.

## Acknowledgements

Thank you to Drg. Harindra, MKM as the Director of the Poltekkes Kemenkes Pangkalpinang which has supported this research

## References

- [1] R. E. Hariani, D. I. Amareta, and A. L. Suryana, "Pola Pemberian Asi Dan Makanan Pendamping Asi Terhadap Grafik Pertumbuhan Pada Kartu Menuju Sehat (KMS)," *J. Ilm. Inov.*, vol. 16, no. 1, Jun. 2016, doi: 10.25047/jii.v16i1.5.
- [2] A. Devriany, Novidiyanto, and Bohari, "Determinants of Exclusive Breastfeeding Duration on Infants in Girimaya Community Health Center Pangkalpinang City," *Indian J. Public Health Res. Dev.*, vol. 10, no. 10, p. 614, 2019, doi: 10.5958/0976-5506.2019.02880.8.
- [3] K. Zhang, L. Tang, H. Wang, L.-Q. Qiu, C. W. Binns, and A. H. Lee, "Why Do Mothers of Young Infants Choose to Formula Feed in China? Perceptions of Mothers and Hospital Staff," *Int. J.*

- Environ. Res. Public. Health*, vol. 12, no. 5, pp. 4520–4532, May 2015, doi: 10.3390/ijerph120504520.
- [4] J. A. Lothian, “The Birth of a Breastfeeding Baby and Mother,” *J. Perinat. Educ.*, vol. 14, no. 1, pp. 42–45, 2005, doi: 10.1624/105812405X23667.
  - [5] A. R. Badrus, “Perbedaan Massage Woolwich Dan Massage Rolling (Punggung) Terhadap Peningkatan Produksi Asi Pada Ibu Postpartum,” *J-HESTECH J. Health Educ. Sci. Technol.*, vol. 1, no. 1, pp. 43–49, Aug. 2018, doi: 10.25139/htc.v1i1.1081.
  - [6] D. Desmawati, “Determinant of Breastmilk Excretion Speed Post Sectio Caesarea,” *Kesmas Natl. Public Health J.*, vol. 7, no. 8, Art. no. 8, Mar. 2013, doi: 10.21109/kesmas.v7i8.22.
  - [7] H. Novariant and M. Tulalo, “Kandungan Asam Laurat pada Berbagai Varietas kelapa Sebagai Bahan Baku VCO,” *J. Penelit. Tanam. Ind.*, vol. 13, no. 1, pp. 15–25, 2007.
  - [8] S. Karouw, “Pemanfaatan Stearin Sawit Dan Minyak Kelapa Untuk Formulasi Asam Lemak Mirip ASI,” *Perspekt. Balai Penelit. Tanam. Palma*, vol. 13, no. 2, pp. 8–15, 2014.
  - [9] E. S. Mezzacappa, R. M. Kelsey, and E. S. Katkin, “Breast feeding, bottle feeding, and maternal autonomic responses to stress,” *J. Psychosom. Res.*, vol. 58, no. 4, pp. 351–365, Apr. 2005, doi: 10.1016/j.jpsychores.2004.11.004.
  - [10] A. M. Stuebe, K. Grewen, and S. Meltzer-Brody, “Association Between Maternal Mood and Oxytocin Response to Breastfeeding,” *J. Womens Health*, vol. 22, no. 4, pp. 352–361, Apr. 2013, doi: 10.1089/jwh.2012.3768.
  - [11] A. Rif'an and Wagiyono, “Pemberian Back Rolling Massage Dan Woolwich Massage Terhadap Kecepatan Ekskresi Asi Pada Ibu Post Partum Dengan Sectio Caesarea Di RSUD Ambarawa,” *Karya Ilm.*, vol. 6, no. 1, Art. no. 1, 2017, Accessed: Apr. 06, 2020. [Online]. Available: <http://ejournal.stikestelogorejo.ac.id/index.php/ilmukeperawatan/article/view/647>.
  - [12] R. F. Zamzara, D. Ernawati, and A. Susanti, “Pengaruh Pijat Oksitosin Terhadap Waktu Pengeluaran Kolostrum Ibu Post Partum Sectio Caesaria,” *J. Ilm. Kesehat.*, vol. 8, no. 2, pp. 229–241, 2015.
  - [13] E. Stillerman, *Prenatal Massage - E-Book: A Textbook of Pregnancy, Labor, and Postpartum Bodywork*. Elsevier Health Sciences, 2007.
  - [14] E. F. A. Shanti, “Efektifitas Produksi ASI Pada Ibu Post Partum Dengan Massage Rolling (Punggung),” *Midwifery J. J. Kebidanan UM Mataram*, vol. 3, no. 1, Art. no. 1, Jan. 2018, doi: 10.31764/mj.v3i1.152.
  - [15] A. A. Kibria, Kamrunnessa, and M. M. Rahman, “Extraction and Evaluation of Phytochemicals from Green Coconut (Cocos nucifera) Shell,” *Malays. J. Halal Res. J. MJHR*, vol. 1, no. 2, pp. 19–22, 2018, Accessed: Apr. 06, 2020. [Online]. Available: <https://ideas.repec.org/a/zib/zbmjhr/v1y2018i2p19-22.html>.
  - [16] L. Yang, X. Liu, X. Zhuang, X. Feng, L. Zhong, and T. Ma, “Antifungal Effects of Saponin Extract from Rhizomes of *Dioscorea panthaica* Prain et Burk against *Candida albicans*,” *Evidence-Based Complementary and Alternative Medicine*, 2018. <https://www.hindawi.com/journals/ecam/2018/6095307/> (accessed Apr. 06, 2020).
  - [17] G. R. Waller and K. Yamasaki, Eds., *Saponins Used in Food and Agriculture*. Springer US, 1996.



