

BREASTFEEDING CHALLENGES: DATA MINING ON MALAY FORMULATION AND PRACTICE AS RECOMMENDED IN THE MALAY MEDICAL MANUSCRIPTS

Nur Alia Mohammad Rihan¹, **Radiah Abdul Ghani, PhD**^{1*} and Mohd Affendi Mohd Shafri, PhD¹

Department of Biomedical Science, Kulliyyah Of Allied Health Sciences, International Islamic University Malaysia, Jalan Sultan Ahmad Shah, Bandar Indera Mahkota 25200 Kuantan, Pahang, Malaysia

Corresponding Author's email: radiah@iium.edu.my

ABSTRACT

Introduction: Breast milk confers numerous benefits to infants throughout their stages of life. Inappropriate practice and cessation of breastfeeding are also associated with several breastfeeding-associated disturbances among women. Besides, it is renowned that Malays have inherited many practices for centuries, especially practices using natural products in healing an illness, including remedies to enhance milk production and treat breastfeeding-associated problems. These practices had been documented in the written form, which is known as Malay medical manuscripts. **Aim:** This study sought to discover the potential natural products that the Malays employ to encounter breastfeeding mothers' problems as documented in Malay medical manuscripts. **Methods:** A narrative review procedure was applied for data mining on Malay medical manuscripts. Thematic analysis was adopted, which is crucial to investigate the data that are significant for this study. **Results:** The review's findings demonstrated the discovery of information in the derived sources that relates closely with the breastfeeding aspects: Kitab Perubatan Melayu: Tayyib al-Ihsan fi Tibb al-Insan, Seksologi: Ilmu Perkasihan Melayu and Warisan Perubatan Melayu. Altogether nine traditional remedies were found in the formulations. Thematic analysis showed two breastfeeding-associated problems mentioned in the formulations: breast engorgement and clogged ducts. **Conclusion:** This study has discovered that there is data available about breastfeeding, including its treatments, recommended in the Malay medical manuscripts. However, more transliteration of the manuscripts and review of secondary sources is proposed to overcome the limitation of breastfeeding data. This discovery of breastfeeding treatment in Malay medical manuscripts would be very much appreciated if they can contribute to the incorporation of local natural products into the current modern medicine for breastfeeding treatment.

KEYWORDS: breastfeeding; Malay medical manuscript; narrative review

INTRODUCTION

In this era of the fast-growing number of the world population, it has been shown that there is also a rapid growth in the average number of births per year worldwide (Ritchie, 2019). The increasing rate of births indicates a pressing need to provide the infants' ideal nutrition to ensure their optimum growth and development. In light of that, the government and health care providers must seek solutions to improve breastfeeding practice rates among mothers worldwide. In 2011, the World Health Organization (WHO) had recommended the mothers to practice breastfeeding exclusively for the first six months after their infants' delivery. Continuation of breastfeeding needs to be done in the subsequent months and nutritious complementary food needs to be provided until two years of age and beyond. It is noted that by practicing exclusive breastfeeding, the infants' optimal growth, development, and health can be realised (WHO, 2011). The Malaysian government also made use of a similar application for its society with the execution of the National Breastfeeding Policy, which was revised in 2005 (Ministry of Health, 2016).

In the United States, a vision, 'Healthy People 2020', was proposed to set targets in many fields to be achieved in 2020 and one of the targets is to increase the breastfeeding rate to 50% nationwide (Centers for Disease Control and Prevention, 2018). Globally, the percentage of infants aged 0-5 months who exclusively breastfed has increased from 35% to 42% from 2005 to 2018. However, the rates are still far from reaching the expected breastfeeding rates for the specified vision (United Nations Children's Fund, 2019). Similarly, in Malaysia, there was a recent study conducted by Basma & Nor Azwani (2016) in Ampang, Selangor in which the prevalence of exclusive breastfeeding (EBF) and its determinants were being analysed. The study reported that less than one-third (28%) of Malay mothers practising breastfeeding for up to six months. This suggests that EBF is still uncommon among Malaysian mothers due to related factors affecting their feeding duration.

Some mothers find it difficult to breastfeed as they encounter a few problems, and the most common one is insufficient milk. Mothers may also suffer from breastfeeding problems such as breast engorgement and nipple trauma. Many studies showed that most women had suffered from those problems (Brown, Dodds, Legge, Bryanton, & Semenic, 2014; Gerd, Bergman, Dahlgren, Roswall, & Alm, 2012). Today's trend shows that women suffering insufficient lactation are very likely to opt for over-the-counter synthetic medications (Brodribb, 2018). Yet, some are not recommended to be taken routinely as their effectiveness is still in dispute. Few concerns have been addressed regarding the utilisation of synthetic galactagogues, such as metoclopramide and domperidone. Health care providers also have recommended applying lanolin, an analgesic, as a treatment for nipple pain. However, Jackson & Dennis (2017) reported no significant difference of the pain intensity between treated and control groups.

Natural product-based agents are available for treating mothers with problems in breastfeeding. However, issues may be raised concerning their efficacy and safety. Limited evidence and data are found in the use of natural products as milk inducers (Tabares, Jaramillo, & Ruiz-Cortés, 2014). The Malay community is known to have traditional practices inherited from their ancestors. Some methods were noted into written form and have been acknowledged as Malay medical manuscripts, which comprise practices related to medical or in healing an illness. Henceforth, to provide more evidence of natural products as milk inducers, these Malay medical manuscripts can be referred to as the primary sources for this study.

This study aimed to review the traditional practice of breastfeeding based on the Malay medical manuscripts. It was also conducted to identify the traditional remedies used to treat breastfeeding problems and determine the formulation of milk inducers based on the Malay medical manuscript.

METHODS

Identification and Review of Derived Sources

Relevant parts of the derived sources, which are secondary sources of manuscripts such as published books, were identified. Inclusion criteria for review are transliterated manuscripts and manuscripts that are published in English and Malay. Firstly, identification of the derived Malay medical manuscripts was accessed via the online public access catalog (OPAC) of specific libraries, with their availability noted. The desired manuscripts were then collected and borrowed if they are available and accessible. The derived manuscripts were reviewed and assessed for their content to ensure that they satisfied the inclusion criteria. Parts or chapters relevant to breastfeeding were identified to gain desired information for this study.

Data Extraction and Collection

Raw data were extracted and collected following the research questions and objectives involved in this study. These search terms were collectively used when searching data; "susu", "susu ibu", "payudara", "tetek", "buah dada", and "kopek" for Malay terms as well as "milk", "breast milk" and "breast" for English words. The abstract or introduction of manuscripts was referred to determine the study's relevance, followed by relevant chapters identified to assess the relevant information to be included in this study. If the relevance of the study cannot be determined from the abstract, introduction, and list of chapters, the manuscripts were read in their entirety.

Data Synthesis and Analysis

Synthesis and analysis of data for this study were adapted from Gasparyan et al. (2011) (Table 1). Other references were applied too as external tools to read manuscripts to search for information regarding the practices and formulations related to the title. Consecutively, thematic analysis was used by adopting Braun and Clarke's method (Maguire & Delahunt, 2017; Scharp & Sanders, 2019). There are six steps included: 1) becoming familiar with the data; 2) generating initial codes; 3) searching for themes; 4) reviewing themes; 5) defining and naming themes; 6) writing up. Methods using Microsoft Excel had been adopted from Bree & Gallagher (2016) and used to migrate the information from Microsoft Word, become familiarised with the data, and collate them under the identified themes. Each thematic area was defined and named after several reviews and identification of key points according to its essence (Bree & Gallagher, 2016; Maguire & Delahunt, 2017).

Table 1: Steps in data synthesis and analysis

Steps	Explanations
Categorisation of data	Data which are similar in terms of level of evidence were grouped into certain categories.
Data synthesis	Synthesis of data was performed by forming tables or figures using Microsoft Excel according to groups to visualise and provide a better understanding of the information. It functioned to ease the process of data analysis.
Data analysis	Data that have been collected and synthesised were analysed by discussing the findings and conclusions from the sources.

Precisely for this study, the themes were analysed based on the formulations from the texts. These include the manifestation of the medical conditions, the ingredients, including the presentation of single or multiple compounds, and the treatment methods, including the body systems the treatment applied to, for each formulation.

RESULTS

Review of Derived Sources of Malay Medical Manuscripts

Out of the fifteen reviewed publications (Table 2), three publications contained breastfeeding practices and associated treatments, as noted below:

1. Kitab Perubatan Melayu: Tayyib al-Ihsan fi Tibb al-Insan
2. Seksologi: Ilmu Perkasih Melayu
3. Warisan Perubatan Melayu

Table 2: List of reviewed publications

No.	Book Title	Year of publication
1.	Kitab Perubatan Melayu: Sari Segala Ubat, Ṭabīb Diraja Kesultānan Pontianak	2019
2.	Falsafah dan Prinsip Asas Perubatan Melayu	2019
3.	Seksologi: Ilmu Perkasih Melayu	2019
4.	Kitab Tib MSS 1292 PNM: Edisi dan Suntingan Teks	2019
5.	Kitab Perubatan Melayu: Rumah Ubat di Pulau Penyengat	2018
6.	Kitab Perubatan Melayu: Tayyib al-Ihsan fi Tibb alInsan	2018
7.	Perubatan Melayu Berdasarkan Manuskrip Kitab Tibb Melayu	2018
8.	Kitab Perubatan Melayu: Khazinat al-Insan, Perbendaharaan Manusia	2017
9.	Kitab Perubatan Melayu: Al-Raḥmah fi al-Ṭibb wa alḤikmah	2017
10.	Malay Medical Manuscripts: Heritage from the Garden of Healing	2017
11.	MSS 2999 Kitab Tib: A Modern Medical Insight into and Interpretation of a Malay Medical Manuscript	2015
12.	Kitab Tib MSS 2515: Perpustakaan Negara Malaysia: Kajian Teks dan Suntingan	2014
13.	Kitab Tib: Ilmu Perubatan Melayu	2006
14.	Analisis Bahasa dalam Kitab Tib Pontianak	2006
15.	Warisan Perubatan Melayu	2005

Traditional Remedies for Breastfeeding Problems

The review showed that there were nine natural products found as the traditional remedies for breastfeeding problems (Table 3). They may be used alone or combined with other ingredients to treat the problems according to the specified methods.

Formulation of Ingredients

Based on the review, ten formulations of ingredients for breastfeeding treatments were obtained. From the three publications, the formulations of ingredients had been organised according to the medical conditions mentioned, as noted in Table 3 (Abdul Samad, 2005; Harun & Naseer, 2019; Mohd. Affendi, 2018).

Thematic Analysis

Analysis has been conducted based on the presentation of medical conditions, ingredients, and methods of treatment. From the first analysis, two themes emerged which presented the manifestation of the medical conditions. The two themes are breast engorgement and clogged ducts, as illustrated in Figure 1, including the key points found in the formulations and *materia medica* (ingredients) for each theme. "Breast engorgement" was chosen as the first thematic area and defined as the swelling and distension of the breasts. As for the second thematic area, it was named "clogged ducts". This second thematic area is defined as a breastfeeding problem that is generally suffered by women, including breast and nipple pain, which causes the insufficiency of the milk supply.

Ingredients found in the formulations were analysed and grouped according to their origins, either plants or animals, as shown in Table 3. If the ingredients were not suitable for both groups mentioned above or unidentified, they were classified as 'other'. It was also analysed that five ingredients are applied to multiple or mixed compounds for the treatment, while the rest is used as a single compound (Table 3).

The standard methods of treatment emphasised in the formulations mentioned above are topical application and oral administration. Table 3 indicates the modes of therapy mentioned in the formulations and the words used. It is noted that there was a formulation that needed the person to do some practices (*amalan*) in addition to topical or oral administrations. In *Seksologi: Ilmu Perkasihan Melayu and Warisan Perubatan Melayu*, the application methods also include bathing with hot or warm water for three days while also applying the ingredients on the breast surface for three days as stated in Table 3.

Table 3: Formulations of ingredients with the origins of ingredient, their applications and methods of treatment

No.	Breastfeeding Problem	Publication	Ingredient	Formulation	Translation of Formation	Origin of Ingredient	Application	Method of Treatment
1.	<i>Bengkak susu atau keras susu</i>	Kitab Perubatan Melayu: Tayyib al-Insan fi Tibb al-Insan	<i>Daun jarak Burma, cuka</i>	<i>(Dan) daun jarak yang ditumbuk serta cuka memberi manfa'at pada bengkak kemudian beranak.</i>	(And) Paste the pounded daun jarak Burma as well as vinegar hence, it may be beneficial on the swelling of breast after childbirth.	Plant, others	Multiple compounds	Topical administration
			<i>Halbah</i>	<i>(Dan) halbah Tempek ditumbuk yang lagi dimasakkan dia memberi aka-manfa'at keras susu.</i>	(And) Paste halbah that is pounded and then is cooked which gives the benefit to <i>keras susu</i> .	Plant	Single compound	Topical administration
2.	<i>Sakit susu</i>	Kitab Perubatan Melayu: Tayyib al-Insan fi Tibb al-	<i>Tepung kacang fūl, cuka</i>	<i>Memberi manfa'at akan dia lumur dengan tepung kacang fūl serta cuka. Intahā, Qalyūbī.</i>	Benefited by smearing the breast with <i>tepung kacang fūl</i> and vinegar. <i>Intahā, Qalyūbī.</i>	Plant, others	Multiple compounds	Topical administration

		Insan	<i>Dadis lembu</i>	<i>(Dan) Makan dadis lembu dan tempeknya memberi manfa'at padanya. Intahā, Mukhtasar Suwaydī.</i>	(And) Eating and then pasting <i>dadis lembu</i> benefits the breast. <i>Intahā, Mukhtasar Suwaydī.</i>	Animal	Single compound	Oral administration
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3.	<i>Susu yang tiada keluar airnya</i>	Seksologi: Ilmu Perubatan Melayu	<i>Susu lembu atau susu kerbau</i>	<i>Ambil susu lembu atau susu kerbau hurutkan pada susu yang tiada keluar airnya, maka mandi dengan air hangat tiga hari hurut pun tiga hari.</i>	Take cow's milk or buffalo's milk and rub it on the breast that does not come out of the water, then take a bath with warm water for three days and rub it for three days.	Animal	Single compound	Topical administration
			<i>Jintan hitam, sirih pinang</i>	<i>Ambil jintan hitam, mamah dengan sirih pinang, semburkan pada susunya.</i>	Take black cumin, chew with betel nut, spray on the breast.	Plant	Multiple compounds	Oral (<i>mamah</i>), topical (<i>sembur</i>) administration
			<i>Hempedu lembu</i>	<i>Ambil hempedu lembu, maka sapukan pada susunya itu, nescaya berair, afiat.</i>	Take cow's bile, then apply it on the breast, it must be watery, <i>afiat</i> .	Animal	Single compound	Topical administration

Warisan Perubatan Melayu	<i>Susu lembu atau susu kerbau</i>	<i>Ambil susu lembu atau susu kerbau; urutkan pada susu yang tiada keluar airnya itu. Mandi dengan air panas tiga hari; urut pun selama tiga hari juga.</i>	Take cow's milk or buffalo's milk; massage on the breast that does not come out of the water. Bathe with hot water for three days; massage for three days as well	Animal	Single compound	Topical administration
	<i>Jintan hitam, sirih pinang</i>	<i>Ambil jintan hitam, mamah dengan sirih</i>	Take black cumin, chew with sirih	Plant	Multiple compounds	Oral (<i>mamah</i>), topical (<i>sembur</i>)

			<i>pinang, semburkan pada susunya.</i>	<i>pinang, spray on the breast.</i>			administration
		<i>Hempedu lembu</i>	<i>Ambil hempedu lembu; sapukan pada susunya itu, insya-Allah ta'ala akan berair.</i>	Take cow's bile; apply on the breast, God willing, it will be watery.	Animal	Single compound	Topical administration

Figure 1: Manifestation of the medical conditions and their interventions.

* Kitab Perubatan Melayu: Tayyib al-Ihsan fi Tibb al-Insan, + Seksologi: Ilmu Perkasihan Melayu, ° for Warisan Perubatan Melayu.

DISCUSSION

Throughout this study, the findings provide evidence concerning the traditional Malay practice where the locals utilised natural medicinal products to treat illnesses for centuries. Relative to this study's first objective, the results revealed that there is information available regarding the breastfeeding aspects in the Malay medical manuscripts. The discovery of three related publications depicted the accessibility of data through narrative review. As far as the discovery is concerned, it is noteworthy to highlight the lack of breastfeeding information in the Malay medical manuscripts. The related diseases are not being defined and described clearly in the texts or transliterations from the close reviews. No details of the illnesses were included, such as their symptoms, thus may cloud the ability to differentiate the different breastfeeding problems. Most of the breastfeeding treatments' data were not specified under one topic or subtopic but were interspersed between other discussions on females' illnesses such as postpartum depression, menstrual cramps, and childbirth, or other sexual aspects of both genders.

Despite the lack of related information, the traditional remedies for breastfeeding treatment have been identified. The common and scientific names of the ingredients were searched via the dictionaries and online database to discuss further the evidence concerning the Malay medical manuscripts' formulations (Table 4). As for *dadis lembu*, it has been cited in the publication, Kitab Perubatan Melayu: Tayyib al-Ihsan fi Tibb al-Insan that the word *dadis* refers to the word *dadih* which means cow's or buffalo's concentrated milk (Mohd. Affendi, 2018; Dewan Bahasa & Pustaka, 2007). The result also revealed that there are ten formulations achieved from the data collection.

Table 4: Common names and scientific names of the ingredients with their scientific evidences from contemporary studies

Ingredient	Common Name	Scientific Name	Scientific Evidence
Cuka	Vinegar	-	No sufficient data is available.
Dadis lembu	Cow milk/buffalo milk	-	No sufficient data is available.
Daun jarak (Burma)	Leaf of physic nut	<i>Jatropha curcas</i> L.	No sufficient data is available.
Halbah	Fenugreek	<i>Trigonella foenum-graecum</i>	<i>In vitro</i> study and clinical data on milk production are available; the exact mechanism is still unknown (Gabay, 2002; Tabares et al., 2014).

Hempedu lembu	Ox bile	-	No sufficient data is available.
Jintan hitam	Black cumin	<i>Nigella sativa</i>	Preclinical data cited that its active constituent is t-anethole (Hosseinzadeh, Tafaghodi, Mosavi, & Taghiabadi, 2013). Clinical data showed an increase in the prolactin level, mammography, and lactogenic activity (Pujiastuti, Suwondo, & Endang, 2018).
Sirih pinang	Betel leaf and areca nut	<i>Piper betle</i> L., <i>Areca catechu</i>	Available for betel leaf; <i>In vivo</i> study showed an increase in milk yield upon its application (Santra, Konar, Banerjee, & Das, 2013).
Susu lembu/susu kerbau	Cow milk/buffalo milk	-	No sufficient data is available for areca nuts. No sufficient data is available.
Tepung kacang fúil	Faba/fava (powdered)	beans <i>Vicia faba</i> L.	Application may induce favism in infants with G6PD deficiency (Anderson, 2018).

Breast engorgement also has been identified from the analysis and being placed as one of the themes. Its definition was adapted from Berens et al. (2016) due to its similarity with the manifestation stated in the significant formulations that are *bengkak susu* and *keras susu*. Berens et al. (2016) defined breast engorgement as a whole as "the swelling and distension of the breasts, usually in the early days of initiation of lactation, caused by vascular dilation as well as the arrival of the early milk" (Berens et al., 2016, para. 3). Meanwhile, the second thematic area is designated as clogged ducts, which occurs when mothers are suffering from breast or nipple pain and experienced an absence of milk flow. This manifestation of clogged ducts has been found in the formulations where they applied the words "*sakit*

susu" and "*susu yang tiada keluar airnya*" (Figure 1). The ingredients have also been analysed according to their origins, types of application, and methods of treatment (Table 3). They mostly originated from nature, indicating the accessibility for treatment especially among ancestors during the ancient times. The ingredients can also be applied either as a single or multiple compounds. Nurulwahidah, Khadher, & Wan Noor Azila (2019) cited that Prophet S.A.W. emphasised on the single-compound treatment method in which a compound is applied to one type of disease. Contrastingly, Malay medicine tends to practice using multiple compounds to treat a particular disease and its symptoms as its treatment, prevention, and control. The effectiveness of mixed compounds is opined to be superior since the side effects of a single compound can be reduced (Nurulwahidah et al., 2019). Specific treatment methods were also analysed and resulted in two types; topical and oral administration. Malay practice is recognised to consist of tips (*petua*) and abstinence (*pantang larang*). Therefore, it is crucial for the individual to perform specific methods for the importance of taking care of an individual's health (Nornizam, 2017).

The availability of scientific evidence for the traditional remedies regarding the treatment of breastfeeding problems has been searched literally via online databases such as Google Scholar and PubMed Central. Results showed a few contemporary studies have been conducted for certain traditional remedies including fava beans, fenugreek, black cumin, and betel leaf (Table 4). Meanwhile, for the rest, no sufficient data is available, which means that data regarding the scientific evidence, including active compounds and mechanisms of action to stimulate lactation, are still lacking. However, the evidence on cultural and traditional aspects is already available. For instance, in non-Western cultures, some traditional foods and herbs are meant for lactation enhancement among postpartum women. Likewise, fenugreek is also mentioned as one of the natural galactogogues throughout history (Brodrigg, 2018). Hence, it seems to be an excellent approach to investigate further in the future concerning the active compound and mechanism of action of the natural products for breastfeeding treatment. This approach can then support the lack of scientific evidence of natural products. It is noteworthy to mention that the use of any traditional remedies is still not free from side effects. There is a pressing need to conduct empirical studies to evaluate the proper dosage for their application to treat breastfeeding problems.

CONCLUSION

In conclusion, the review of the derived sources of Malay medical manuscripts has discovered the availability of breastfeeding treatments such as formulations of ingredients and application methods. This study has also identified nine traditional remedies and ten formulations of ingredients applied as either a single compound or multiple compounds as treatments for breastfeeding problems. Breast engorgement and clogged ducts have also been identified and defined during thematic analysis based on the Malay medical manuscripts' formulations. It is recommended that more Malay medical manuscripts should be reviewed and transliterated to seek an abundance of information related to the breastfeeding aspects and their treatment. In light of this discovery of Malay medical manuscripts, it is hoped that the application of local natural products and Malay practice can be incorporated into modern medicine to produce an improved treatment, especially for breastfeeding remedies in the future.

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