CONFINEMENT PRACTICES AND ITS ASSOCIATED FACTORS AMONG MALAY POSTPARTUM MOTHERS IN MALAYSIA

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Abstract

There are several confinement practices among the Malay community. It was noted that some of them can be scientifically proven beneficial to the body while some of them have unclear purposes of action and can be potentially harm. Thus, this study is aimed to identify the confinement practices and their associated factors among Malay mothers during the postpartum period. A cross-sectional study (n = 306) was conducted among Malay mothers and the respondents recruited through a validated self-administered questionnaire. The participants were recruited through convenience sampling. The survey was conducted online, in which the advertisement was disseminated through social media and online messenger (*WhatsApp*). Overall, majority of the Malay mothers adhered to confinement practices (100%). Mothers who undergo spontaneous vaginal delivery (SVD) were associated with doing postpartum massage (AOR 5.31, 95%CI 2.72-10.39), consuming traditional herbs (AOR 2.022, 95%CI 1.11-3.70), and showering every day (AOR 3.46, 95%CI 1.08-11.07). Meanwhile, mothers with better household incomes tend to have meals prepared for confinement (AOR 1.99, 95%CI 1.19-3.32) and postpartum massage (AOR 2.75, 95%CI 1.18-6.41). Malay mothers with SVD and better income tend to adhere to confinement practices. However, the results of this study are not generalized to other ethnicities in Malaysia (Chinese, Indian, and others).

Keywords*:* Confinement Practices, Malay, Malaysia, Mothers, Postpartum Care

Introduction

Traditional postpartum practices, or confinement practices, are a norm among most Asian communities, in which mothers are subjected to follow the practices for a period of time after giving birth (1). It is passed down traditionally from a mother to a daughter. These practices aim to heal and regain the mother's energy and health over a specific length of time. The practices may vary according to the mother's background. Malaysia has a multi-ethnic population, including Malay, Chinese and Indian, and each ethnicity has specific postpartum care practices (2). Given the diversity of ethnic groups in Malaysia, all of them observe the same concept in postpartum care practices, which preserve the balance of "hot" and "cold" states within the body. Giving birth is described as "cold" because the blood lost during birth causes a loss of body heat (3, 4). Therefore, practices that keep mothers in a warm state during the postpartum period are encouraged (1). Basir et al. (5) and Poh et al. (6) stated that these might include dietary restrictions, such as eating foods with "hot" properties while avoiding foods with "cold" properties.

However, each ethnicity's practices differ based on traditional knowledge, and cultural beliefs. Malay mothers usually practice confinement for 40 to 44 days (1). In contrast, Chinese and Indian mothers usually practice confinement for 30 days, according to their traditions (1). The major confinement practices adhered by the Malay mothers, such as to remain at home during the confinement period (which also refers to true confinement), consuming herbs, and doing Malay postpartum massage. The postpartum massage commonly involved three sessions over the first week after giving birth and was followed then on the 39th, 40th, and 44th day of confinement. Each session lasts around an hour of massage (1, 2). Similar to the Malay culture, Chinese and Indian mothers were also encouraged to stay indoors, but they faced limitations on

washing their hair and had constraints on how often they could take baths in a day (2).

According to the traditional belief, certain foods were classified as "hot", "cold", and "sharp" based on the properties of the food. "Hot" foods were most commonly encouraged, whereby "cold" and "sharp" foods were usually avoided. For example, Malay mothers observed "hot" food, such as beef, mutton, rice with black pepper, anchovies, and salted fish, as part of their dietary practices. Whereas "cold" vegetables such as water spinach and pumpkins and "sharp" fruits (e.g., watermelons and pineapples) were avoided due to their belief that those can lead to abdominal discomfort (5)

Many factors influence the confinement practice among postpartum mothers. According to a previous study (7), Malay ethnic and those with low monthly household incomes are likely to adhere to confinement practices. However, based on the study of Abdul Ghani & Salehudin (8), there was no significant relationship between sociodemographic data and the postpartum practices. Instead, they found that family tradition was the most significant factor influencing postpartum care practice and the mother's knowledge. This is similar to the study conducted by Wang et al. (9) indicates that Chinese women who are pregnant or giving birth obey tradition due to their mothers' and mothers-in-law's influence and a fear of the implications if they do not. Furthermore, concerning the length of the confinement period, one of the studies stated that women from the middle and upper classes might be able to recruit people to provide the required assistance (10). However, financially disadvantaged women cannot practice a longer confinement period because they or their spouses may need to return to work (1).

Various confinement practices related to dietary intake have been practiced among postpartum mothers, especially among Malays in Malaysia, due to its benefit on health (11, 12). However, it was noted that some of them are still relevant and can be scientifically supported to benefit the body. For instance, the Indian community in Singapore obtained high vitamin-B foods from their traditional postpartum diet of legumes, ethnic bread and soup-vegetable fruit. These foods had a protective impact against postpartum, such as reducing the risk of having anxiety and depression symptoms (12). Besides, the practice of high carbohydrate and protein intake among the postpartum mothers was also observed in their effort to improve breast milk production (13).

In contrast, others have unclear purposes of action that can be deemed a myth or fallacy purely. According to previous findings, consuming traditional herbs can give disadvantage effects such as neonatal jaundice to the infants (14), or higher risk of postpartum depression to the mothers (15). Furthermore, being confined at home or limiting physical activity for a long time is said to weaken the body muscle strength and increase risk of depression (16). Hence, this study aims to identify confinement practices and their associated factors among Malay mothers during the postpartum period in Malaysia. The Malay population was selected in this study because this ethnic group is Malaysia's largest population group. Yet, it is being less studied than the Chinese or Indian population globally.

Materials and Methods

Study design

This research was performed cross-sectional, whereas the data were collected from July to October 2021, using a survey questionnaire at a single point in time. The survey was advertised through *WhatsApp*, *Facebook* page*, and Facebook* page groups that catered to postpartum and breastfeeding women. All interested participants answered the questionnaire online through *Google Form* questionnaires. The study included participants meeting all inclusion criteria: Malay mothers who had undergone a postpartum period, aged 18 years and above, and those who had given live birth between 2020 and 2021. The study exclusion criteria included those diagnosed with a terminal or mental illness due to the difference in lifestyle and belief towards their health, compared with those without these diseases. The difference might contribute to the variation of the data as we only want to include an individual with optimum health.

Sample size

A convenience sampling method was applied to select the participants as the participants were taken conveniently through an online medium. The sample size was determined through Raosoft software. With a 90% confidence level and a 5% margin of error, the sample size for population size (childbirths in 2020) of 487,957 is 271. With an additional 10% to account for any dropout, this study's sample size was 299.

Measurement

A self-administered questionnaire using a bi-lingual language, English and Malay, was divided into Sections A (the Sociodemographic and obstetrical information questionnaire) and B (The confinement practices questionnaire). The confinement practices questionnaire was adapted from the questionnaire by Fok et al. (17). The questionnaire was translated into Malay and validated prior to the study (18). In this questionnaire, the mother was asked about their postpartum practices and current diet during confinement, whether they increased, reduced, or maintained the intake of a specific form of food. First, the level of adherence to confinement practices was asked according to their frequency of doing the practices on the days of confinement, showering, the proportion of confinement-specific meals eaten, going out with or without the infant, and the usage of massage. If the practice is done between 2 times or more per week, it is considered as adherence to the confinement practice. Next, for the dietary assessment, a list of foods based on the common dietary practice of postpartum mothers as reported in Fok et al. (17) was used in this study. Food

restriction is considered as food that is less or not at all consumed during postpartum period, whereas food prescription is considered as food consumed more or same as before the postpartum period. The foods represent major food groups and numerous food categories that can provide valuable information on dietary changes during these times.

Statistical analyses

The data were analysed using version 26 of the Statistical Package for the Social Science (SPSS). All variables, such as mean, standard deviation, frequency, and percentage, were first viewed as descriptive statistics. In addition to univariate statistics, multivariate logistic regression analysis was applied to determine the factors associated with confinement practices. Independent variables considered in the logistic regression model included sociodemographic variables (mother's age, mother's educational level, mother's job status, and average household income) and obstetric variables (method of delivery and number of children). The dependent variables were the type of confinement practices among Malay mothers in Malaysia. This includes undergoing confinement, days of confinement, the proportion of confinement-specific meals eaten, massage during confinement, traditional herbs consumption, showering during confinement, and whether mothers or babies go out during confinement. We considered all possible predictive factors with $p < 0.200$ in univariate analysis into the multivariate model. Both crude and adjusted odds ratios (OR) and corresponding 95% confidence intervals (CI) were used to assess the magnitude of the associations. A significance level was set at $p < 0.05$ and a 95% confidence interval.

Ethical consideration

Prior to the study, the mothers were given an information sheet to inform them concerning this study. All the participants recruited obtained signed and dated consent forms, and they volunteered to participate. The participants were informed that they could refuse to answer any questions at any point or withdraw without consequence. The confidentiality of the data was ensured. This study has obtained ethical approval from the Research Ethical Committee UiTM [Approval no. REC/06/2021 (UG/MR/548)].

Results

Background of participants

A total of 306 Malay postpartum mothers completed the questionnaires. The mean age of the study participants was 29.86 ± 4.91 years old. All the participants were Malay Muslims, and all were married (Table 1).

Table 1: Background of respondents, n = 306

Variable	Mean (SD)	n (%)
Mother's age (years)	29.86 (4.91)	
< 30 years old		168 (54.9)
> 30 years old		138 (45.1)
Mother's education level		
Secondary or lower		67 (21.9)
Diploma or apprentice		94 (30.7)
Higher education		145 (47.4)
Mother's job status, *n*= 303		
Not working		138 (45.5)
Working		165 (54.5)
Average household income		
Less than RM 4,850 (B40)		198 (64.7)
RM 4,850 – RM 10,959 (M40)		92 (30.1)
More than RM 10,959 (T20)		16 (5.2)
Method of delivery		
Spontaneous Vaginal Delivery (SVD)		234 (76.5)
Caesarean section		72 (23.5)
Number of children	2.19 (1.44)	
Primiparous		129 (42.2)
Multiparous		177 (57.8)
Have chronic illness		
Yes		11 (3.6)
No		295 (96.4)
Suffer from chronic depression		
Yes		8 (2.6)
No		298 (97.4)

Confinement practices data

All participants (100%) stated that they adhere to the practices. More than half (85.6%) were in confinement for 40-44 days, while only 14.4% practised it for more than 45 days. Malay postpartum massage was particularly typical among Malay women (82.7%). True confinement (staying at home) was practised among Malay mothers, with most of them were remained at home (60.8%) or does not bring their infant to go out (69.0%) throughout the confinement period. Data on confinement practices are reported in Table 2.

Table 2: Confinement practice data, n = 306

Variable	n (%)
Undergoes confinement	
Yes	306 (100)
Days of confinement	
≤ 44 days	262 (85.6)
≥ 45 days	44 (14.4)
Caregiver during confinement	
Mother/mother-in-law	179 (58.5)
Husband	90 (29.4)
Other relatives	10 (3.3)
Confinement lady	14 (4.6)
Self-care	13 (4.2)
Proportion of confinement-specific meals eaten	
Less or equal to half	139 (45.4)
More than half	167 (54.6)
Massage during confinement	
Yes	253 (82.7)
No	52 (17.3)
Traditional herbs/*Jamu* consumption	
Yes	107 (35.0)
No	199 (65.0)
Showering during confinement	
None/once a week	1 (0.3)
2-6 times a week	11 (3.6)
Everyday	294 (96.1)
Go out during confinement	
None at all	186 (60.8)
Everyday	3 (1.0)
Between 2 to 6 times a week	35(11.4)
Once a week or less	82 (26.8)
Baby goes out during confinement	
None at all	211 (69.0)
Everyday	3 (1.0)
Between 2 to 6 times a week	26 (8.5)
Once a week or less	66 (21.6)

Dietary habit during confinement

The summary of dietary patterns of Malay mothers during the postpartum period was recorded in Figure 1. Overall, the data showed that the mothers consumed nearly complete nutrients, such as eating more rice (83.7%) and bread (62.1%) (carbohydrate group), fish (53.6%) (Include spanish mackerel, torpedo scad, red snapper, threadfin breams) (protein group), leafy (78.4%) and non-leafy vegetables (68.9%) and fruits (include apple, banana, orange, prune, dates and raisin) (fibre group). However, there are some food items that were avoided such as yellow noodles or laksa (82.3%), seafood (82.4%), snake head fish (80.4%), egg (70.3%), blackpepper (77.8%) and coffee (68.3%). Even though the respondent were advised to not consume several types of fruits, yet they were consuming mostly imported fruits such as apple, banana, orange, prune, dates and raisin (76.5%). In terms of beverage, plain water was the most chosen beverages during postpartum period (96.8%).

Factors associated with confinement practices among Malay postpartum mothers in Malaysia

Days of confinement, the meals prepared for confinement, massage practices, traditional herbs consumption, and showering during confinement were significantly associated with some of the mother's background (Table 3). Based on the multivariate logistic regression, mothers who are not working were twice as likely to experience longer periods of confinement (more than 44 days) compared to mothers who do work (adjusted OR 2.59, 95%CI 1.33-5.06). This is parallel to the frequency of mothers who experience a longer period of confinement days (> 44 days) is higher among non-working mothers (65.9%) compared to working mothers (34.1%). Mothers whose age above 30 years old (adjusted OR 1.85, 95%CI 1.042, 3.299), working mothers (adjusted OR 2.34, 95%CI 1.32 – 4.17), have higher average household income (adjusted OR 2.37, 95%CI 1.27, 4.41) and only have 1 child (adjusted OR 2.52, 95%CI 1.39-4.56) have higher tendency to choose mother or mother-in law as their caregiver during confinement period.

Mothers who have an average household income between RM 4,850 to RM 10,959 are twice as likely to have almost all of their meals prepared specifically for confinement (adjusted OR 1.99, 95%CI 1.19-3.32) and to practice postpartum massage (adjusted OR 2.75, 95%CI 1.18-6.41) compared to mothers with average income less than RM 4,850. In addition, we noted that mothers who had spontaneous vaginal delivery were more likely to practice various confinement practices. This includes doing postpartum massage (adjusted OR 5.31, 95%CI 2.72-10.39), consuming traditional herbs (adjusted OR 2.022, 95%CI 1.11-3.70), and showering every day during confinement (adjusted OR 3.46, 95%CI 1.08-11.07) compared to mothers who have a caesarean section. In addition, mothers with one child are threefold more likely to perform postpartum massage (adjusted OR 3.46, 95%CI 1.65-7.30) than mothers of several children. Nevertheless, none of the sociodemographic and obstetrical data was significantly associated with the confined at home (or remaining at home) practice.

Discussion

Confinement practices

The confinement period is perceived to be the time of healing, rest, and cleansing for the mothers. Frequently, a woman's mother, mother-in-law, '*yuesao*' (a maternity matron who specializes in caring for the mother and

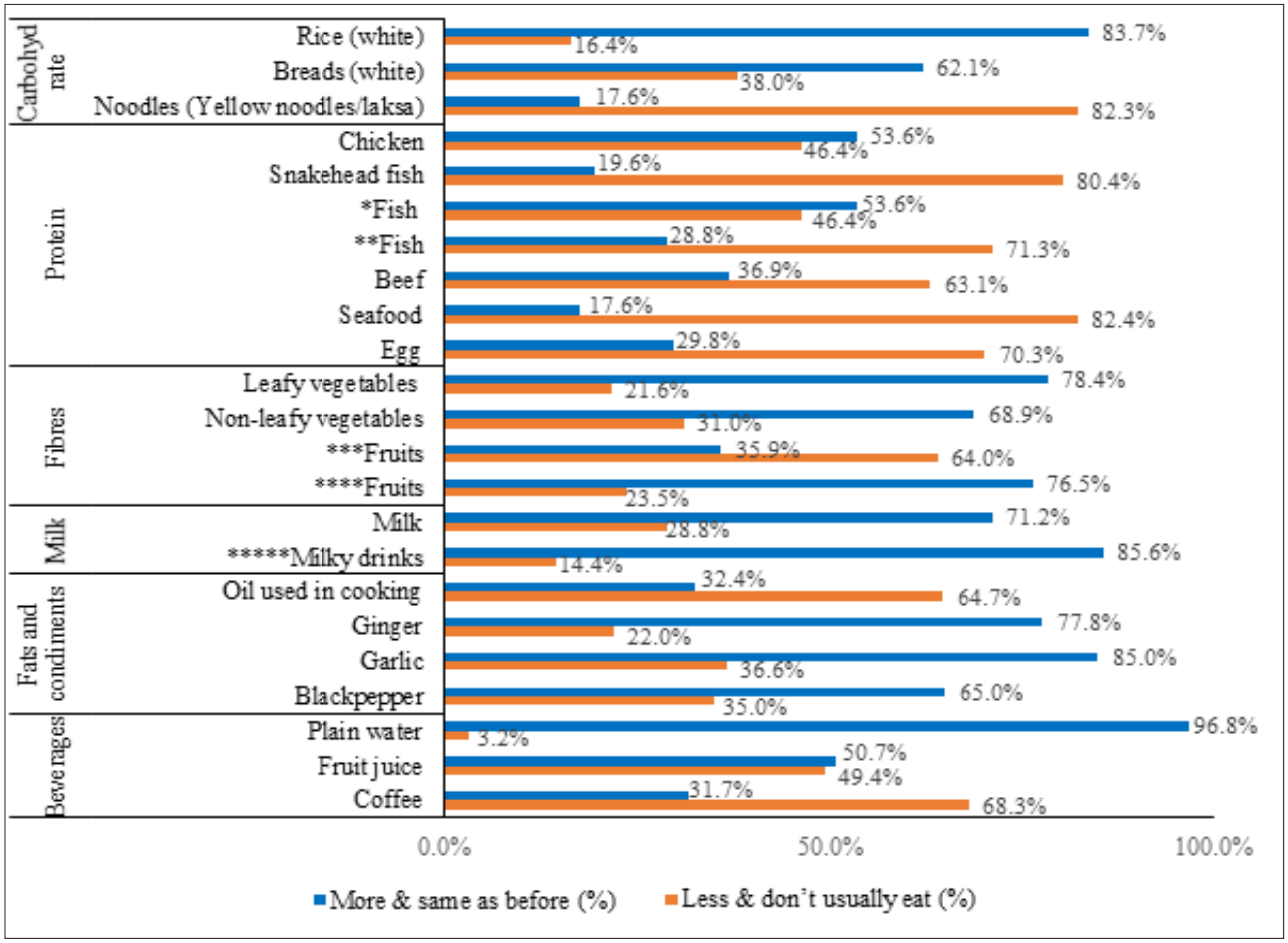

Figure 1: Summary of dietary habit during confinement period.

Acronyms: *Fish include spanish mackerel, torpedo scad, red snapper, threadfin breams; **Fish include Indian mackerel, stingray, catfish, silver catfish; ***Fruits include watermelon, pineapple, nangka, cempedak, durian, rambutan, star fruit, papaya, guava, mango, pear; ****Fruits include apple, banana, orange, prune, dates, raisin; *****Milky drinks include *Milo, Ovaltine, Horlicks* etc.

Table 3: Confinement practices (days of confinement, proportion of confinement-specific meals eaten, massage during confinement, jamu consumption, showering during confinement, go out during confinement and baby go out during confinement) were considered as dependent variables. Possible demographic and obstetric factors were considered as independent variables. Univariate ([a]) and multivariate ([b]) logistic regression analysis were performed.

	n (%)	Crude OR (CI 95%)	p-value[a]	Adjusted OR (CI 95%)	p-value[b]
Days of confinement (>44 days)					
Not working mothers	29 (65.9)	2.589 (1.325, 5.058)	0.005*	2.589 (1.325, 5.058)	0.005*
Caregiver during confinement (Mother/mother-in-law)		1.495 (0.788, 2.837)	0.218	1.775 (0.863, 3.650)	0.119
Caregiver during confinement (Mother/mother-in-law)					
Mother's age (years) > 30 years old	138 (45.1)	2. 812 (1.758, 4.498)	p<0.001**	1.854 (1.042, 3.299)	0.036*
Working mothers	165 (54.5)	1.584 (1.002, 2.505)	0.049	2.343 (1.317, 4.169)	0.004*

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	n (%)	Crude OR (CI 95%)	p-value[a]	Adjusted OR (CI 95%)	p-value[b]
Average household income [RM 4,850 – RM 10,959(M40) vs Less than RM 4,850(B40)]	92 (30.1)	1.829 (1.107, 3.021)	0.018	2.369 (1.272, 4.414)	0.007*
Average household income [More than RM 10 959 vs Less than RM 4,850(B40)]	16 (5.2)	4.023 (1.344, 12.044)	0.013	3.928 (1.178,13.101)	0.026*
Mother who has 1 child	129 (42.2)	4.001 (2.416, 6.626)	p<0.001	2.527 (1.399, 4.566)	0.002*
Meals prepared for confinement (More than half)					
Average household income [RM 4,850 – RM 10,959(M40) vs Less than RM 4,850(B40)]	11 (3.6)	1.992 (1.194, 3.323)	0.008*	1.992 (1.194, 3.323)	0.008*
Massage during confinement (Yes)					
Average household income [RM 4,850 – RM 10,959 (M40) vs Less than RM 4,850(B40)]	84 (33.2)	2.575 (1.151, 5.763)	0.021*	2.752 (1.180,6.419)	0.019*
Spontaneous Vaginal Delivery (SVD)	208 (82.2)	4.80 (2.563, 8.991)	p<0.001**	5.313 (2.718, 10.386)	p<0.001**
Have 1 child	117 (46.2)	2.939 (1.476, 5.855)	0.002*	3.475 (1.653,7.304)	0.001*
Jamu consumption (Yes)					
Spontaneous Vaginal Delivery (SVD)	90 (84.1)	2.022 (1.105, 3.700)	0.022*	2.022 (1.105, 3.700)	0.022*
Showering during confinement (Everyday)					
Spontaneous Vaginal Delivery (SVD)	228 (77.6)	3.455 (1.078, 11.067)	0.037*	3.455 (1.078, 11.067)	0.037*

Acronyms: OR, Odds Ratio; CI, Confidence Interval; * Significant at p<0.05; ** Significant at p<0.001

newborn infant), and/or family relatives are the ones who act as caregivers during the confinement period (19). They also aid the domestic responsibilities and help the new mother to maintain their daily lives during the month. Another previous study (20) has stated that the younger generation preferred confinement with their mother. This is similar to our result in that most participants opted to have their mothers as their caregivers during confinement (20). Having someone trustworthy, dependable, and attentive during this time is critical for reducing the mothers' stress level following delivery, even more so while dealing with the newborn.

On the other hand, the Ministry of Health (MOH) of Malaysia also provides a program called 'Postnatal care at home' wherein nurses or midwives visit postpartum mothers in their homes. The home visit is offered to the mother without any associated risk days 1, 2, 3, 4, 6, 8, 10, 15, and 20. Besides, Ministry of Women, Family and Community Development is also providing a holistic postpartum care services under the name "MamaCare" to improve their well-being and reproductive health of the mothers and family (21). However, if the mother is suffering from other medical conditions, frequent postnatal care would be performed to detect early abnormal conditions (22).

Regarding the days of confinement, most of our participants chose to confine between 31 days – 44 days, consistent with previous literature (20). During these days, the mothers were restricted in both their physical activity and diet, and encourage to do certain postpartum practices such

as doing postpartum massage, hot stone compression and body wrapping (23). However, the duration of confinement days is depended on the mothers' practicality, in which some mothers may confine for up to 60 days due to their feasibility in terms of beliefs and practices (5, 13).

Maternal dietary intake is one of the crucial aspects of the confinement period. Certain meals are believed to promote or restore health. In contrast, others are avoided due to their potential for immediate or future sickness, such as "cold" and "windy" food, which it is believed can cause abdominal discomfort (5, 13). Our finding was similar to the previous study (5), which reported that most participants avoided eating red meat, organ meat, legumes, egg, and chicken during confinement. The avoidance of eggs among postpartum mothers was perceived to cause the pus to exude, which might affect the healing process of the wound. The chicken is also perceived to cause itchiness or be a '*bisa*' (pain) food for postpartum mothers. Furthermore, certain types of fish and seafood were prohibited because they were perceived to cause itchiness or pain. Others have observed a similar finding, where study participants considered the same foods poisonous (6).

According to Ramulondi et al. (24), a food taboos study conducted in northern KwaZulu-Natal, South Africa, explains that fruits and vegetables were the second most frequently consumed meal during postpartum recovery due to their ability to raise and replenish blood. However, in Malay culture, there was a restriction for a certain type of fruits and vegetable intake according to the "hot/cold" property of the food. In our findings, most participants increased their consumption of apples, bananas, oranges, prunes, dates, and raisins. However, they were noted to avoid fruits such as watermelon, pineapple, jackfruit, and durian during the postpartum period. The avoidance of pineapple and watermelon during this period is due to their properties which are generally perceived to have "sharp" and "cold" characteristics (5). The findings that food has a "hot/cold" attribute are consistent with a study that found that the majority of fruits and vegetables are naturally perceived as "cold" (25). On the other hand, apple consumption was permitted during this period, consistent with Basir et al. (5). It demonstrated that Malay mothers considered apples safe to take throughout the postpartum period.

It is observed that majority of the Malay mothers are practising postpartum massage during the postpartum period. This is similar to a study done in Malaysia and Singapore, where most Malay participants were more likely to use massage therapy during this period. Massage is one of the Complementary and Alternative Medicine (CAM) categorized as a manipulative body therapy group. In the opinion of Malaysian women, massage can enhance blood circulation and offer therapeutic heat to the entire body (7). Additionally, studies have shown that massage therapy can increase uterine involution and abdominal muscle tone following birth (23)Evidences showed that Malay mothers and their babies were most likely to stay at home during confinement period. Our finding resembles those in the literature, which suggested that postpartum mothers should avoid going out or travelling long distances and remain inside their homes to avoid being exposed to the wind (26). Furthermore, they believed that going outside their home would lead the wind to enter their bodies, either causing a headache, loss of appetite, or possibly developing a cold (9). Therefore, restrictions during the confinement period were encouraged to allow mothers the time to heal and rest from their regular hectic chores (e.g., sending children to school, shopping, etc.) and facilitate mother-child bonding (20).

Factors associated with confinement practices

There was an association between sociodemographic data related to the mother's job status, with days of confinement. It shows that working mothers may shorten their confinement since they must return to work. Even though this study found that working mothers had a two-fold greater tendency to live with their mothers or mother-in-law, the likelihood of staying with their mothers were reduced if the new mothers had to start working. Thus, the role of the mother or mother-in-law as a caregiver does not influence the period of confinement practice among these mothers. As a consequence, this droves them away from the support system, which made it harder for them to prolonged confinement practices (27). In contrast, Fok et al. (17) reported that sociodemographic data, including the mother's job status, is not associated with the days of confinement. They stated that the practice regarding the confinement period is most likely to be affected by the mother's belief itself and not by the other factors (5, 13).

It has also been demonstrated that mothers with higher household incomes were more likely to have meals prepared specifically for confinement and practising postpartum massage during this period. Mothers with higher incomes have the ability to invest in hiring confinement lady, who will assist them in preparing confinement food. Besides, they had the money to pay an experienced masseuse to give them the postpartum massage (23). In addition, mothers with financial advantages were able to afford nutrient-dense healthier food, in accordance to some of the recommended confinement diets (28). Ability to purchase and hiring will further empower them to make their own healthy choices.

Furthermore, we observe that engaging with postpartum massage costs around RM 250 (USD = $60.35) monthly, a significant sum for some people, particularly those with low income (23). Therefore, the costs associated with providing postpartum massage may explain why mothers with higher incomes frequently had a postpartum massage. However, the result contradicts a few studies, stating that mothers with low income are more likely to have postpartum massage than those with higher income (8, 20). A previous study reported that low-income mothers who mainly resided in rural areas and shared housing with their parents might exercise greater levels of influence and values on those mothers' decisions to utilize traditional

confinement practice. Furthermore, the cost of services in traditional confinement practices in rural areas may be lower and more accessible (7) than in urban areas.

Concerning the delivery method, this finding is similar to the previous study (23) demonstrated that individuals who delivered vaginally are more likely to use Complementary Alternative Medicine (CAM), than those who delivered via caesarean section. One of the CAM components is postpartum massage. The postpartum massage, which requires bodily movements including a mixture of kneading, stroking, and pressing with hands on the body (29), may lead to discomfort and pain among mothers with caesarean section (23). Hence, this postulate that mothers with caesarean section are less likely to do postpartum massage.

In addition, mothers with spontaneous vaginal delivery were associated with consuming traditional herbs, consistent with the previous literature (23). In contrast, Abdou & Fathey (30) demonstrate no significant association between spontaneous vaginal delivery and traditional herbs consumption. Although some mothers believe traditional herbs will help mothers to increase breast milk and aid in postpartum recovery, a few studies have shown that traditional herbs consumption may lead to neonatal jaundice, allergic skin reaction, and constipation in the newborn (20, 26). Furthermore, it is also reported that the possibility of biochemical substances in traditional herbs might play a role in the development of postpartum depression (15). Thus, this may explain why mothers with caesarean sections are less likely to consume traditional herbs. They are facing the possibility of experiencing negative impacts following the delivery procedure and would not like to add more unwanted complications by consuming the herbs (31, 32).

Consistent with the result in this study, mothers with spontaneous vaginal delivery were three times more likely to shower every day compared to mothers with caesarean section. In a tropical climate like Malaysia, mothers may find it inconvenient and unsanitary not to bathe during the postpartum period. However, showering in cold water is prohibited as it is perceived can cause blood clotting or sore joints, according to the traditional postpartum practice (2). Therefore, mixing medical herbs with hot water during their routine bath is encouraged by the traditional practice (2), and this practice has been implemented in countries such as China and Laos (17). Herbal bath is one of the common confinement practices among Malay mothers in Malaysia. On average, the mothers would take herbal baths six days after childbirth, using warm water added with various herbs, such as *Desmodium gangeticum* (*Daun Meringan*) (2, 8).

According to Teoh et al. (14), multiparous mothers utilized more complementary and alternative medicine (CAM) than primiparous mothers. In contrast to the findings in this study, our results indicate that primiparous mothers were more likely to have postpartum massage than multiparous mothers. Based on our observation, having one child and less commitment to care for another child, observing positive results from other users, and simply wanting to 'try it out' (23) since they are first-time mothers led these mothers to practice massage more frequent than multiparous mothers.

It was found that mothers in this study consume a higher volume of plain water, fruit juice, milk, and an adequate amount of macronutrients and fibre. Evidence supports that drinking a high volume of water and milk (5, 30) had improved breastfeeding outcomes (33). Furthermore, it is found that positive breastfeeding attitude and practice had play a key role in avoiding postpartum depression (32, 33). However, this result is contradicted with previous study, which has shown that the consumption of water among Malay postpartum mothers who adhere to confinement practice were low and not achieving the recommended level. The discrepancies may be due to the increase intention to breastfeed their infant among postpartum mothers (34) and the awareness of consuming a sufficient water intake to reduce risk of constipation, dehydration (8). On the other hand, ginger, garlic and black pepper are the herbs that were commonly consumed by the mothers, in parallel with other studies (15, 35, 36). All of these herbs are thought to have the potential to warm and nourish the body, which may hasten the drying and aid in healing of mothers' vaginal wound (13).

Some mothers believed that by restricting some foods, this practice may provide a healthier diet and sufficient energy and avoid health consequences (37). However, the practice had limited the options available for mothers due to excessive restrictions on certain food, especially on protein-rich foods. Snakehead murrel, beef, organ meats, seafood, several types of beans, eggs, and various types of fish (Indian mackerel, skipjack tuna, stingray, catfish, silver catfish, and yellow stripe scad) are the examples of restricted protein-rich foods. Insufficient intake of protein has led to deficiencies of several micronutrients, such as iron, folate, and polyunsaturated fatty acid (PUFAs), such as docosahexaenoic acid (DHA). These micronutrients are essential role in transferring oxygen to tissues, amino acid metabolism, and cognitive development in breastfed babies (38). Deficiencies of these micronutrients can lead to anaemia, leucopenia, negative nitrogen balance, muscle wasting, and retarded recovery (34, 36). Thus, a balanced diet practice should be emphasized for Malay mothers' confinement.

Based on our observation, although various studies have shown improved well-being through nutrition and physical activity intervention among postpartum mothers (39), no intervention study in Malaysia focuses on improving mothers' well-being through healthy confinement practices. One recent study to enhance the breastfeeding practices through a comprehensive training module in confinement centres does not imply a favourable achievement in the long run due to the clash between breastfeeding and traditional confinement practices (40). However, previous research showed that the intervention

of relaxation therapy audio recordings while breastfeeding improved breastmilk output and composition, mothers' mental health and infants' outcome such as longer sleep duration and higher weight gain (41). Hence, this underlines that cultural concept might play an essential role in forming a healthy postpartum practice. Thus, continued public education on the healthy practice during postpartum period are imperative for the long-lasting positive changes.

Strength and limitations

This study investigates the sociodemographic and obstetric factors associated with confinement practices. However, this study has some limitations. Primarily, the participants in this study are only Malay women. As a result, the findings may not generalize to other ethnic populations in Malaysia. Thus, future research should include all ethnicities in Malaysia. Secondly, this study was conducted online and did not involve group discussions with the participants. The investigator might gain a better understanding of why Malay mothers engaged in or did not engage in the confinement practices by allowing the participants to share their opinions through group discussions about confinement practices. Besides, the finding that 100% of the participants were undergo confinement may indicates that the sample size is still homogenous. This finding may be explained by the fact that perhaps only those who engaged in confinement practice had responded to survey. Larger sample size in the future is needed in order to have a more reliable results and small margin of error.

Conclusion

It was found that most Malay mothers in Malaysia still engage in traditional confinement practices. However, mothers who are not working, have higher household incomes, have one child, and have had spontaneous vaginal delivery tend to adhere to more confinement practices. Additionally, majority of the Malay mothers are still adhering to the postpartum dietary practice. In conclusion, the confinement practice had been culturally instilled in most mothers. Nevertheless, awareness of safe practices and healthy dietary intake is lacking. Thus, awareness should be highlighted to improve mothers' and infants' well-being following cultural competence.

Implications for practice

These findings may assist healthcare providers in gaining a better understanding of confinement practices, allowing them to better support Malay women and design particular postpartum care for them. It is essential to examine the mothers' well-being to ensure they are following safe confinement practices with sufficient dietary intake. In contrast, important information regarding optimum postpartum health can be delivered during postnatal care visits. Further research on education modules with guidelines for enhancing healthy confinement practices is necessary to be developed. This ensures recommendations are tailored to each new mother's particular needs.

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