

BMJ Open Dietary habit and lifestyle of postpartum women in South China: a mixed methods research

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ABSTRACT

Objective To investigate the dietary and hygiene behaviours and influencing factors of women during the puerperium in South China.

Design A cross-sectional study.

Setting Three tertiary hospitals in Guangdong Province, China

Participants From November 2022 to March 2023, 327 women with puerperal experience were enrolled using the purposive sampling method, with 323 valid questionnaires collected for data analysis. Semistructured interviews were conducted with six puerperium women and five primary caregivers.

Primary and secondary outcome measures This study used a questionnaire survey to collect and analyse the current postpartum dietary and hygiene behaviours among women in the South China region, along with their influencing factors.

Results Multinomial logistics regression revealed women residing in urban-rural fringe were more likely to use ventilated rooms (OR 4.496, 95% CI 2.363 to 8.552) and avoid hair washing (OR 0.345, 95% CI 0.159 to 0.749) compared with urban residents. Additionally, women who practiced Buddhism were more likely to wash their hair (OR 11.070, 95% CI 2.339 to 52.379) and take baths (OR 6.856, 95% CI 2.057 to 22.855) compared with those with no religious affiliation. Lastly, those whose primary caregiver was their husband were more likely to consume watermelon (OR 2.235, 95% CI 1.119 to 4.463), persimmon (OR 4.395, 95% CI 1.886 to 10.242) and longan (OR 2.612, 95% CI 1.362 to 5.010). The qualitative study identified five themes: dietary practices, hygiene habits, personal attitude, sources of information and support.

Conclusion The dietary and hygiene behaviours of puerperium women in South China are significantly influenced by the resident, primary caregivers and religious beliefs. Medical care providers should adopt a precision postpartum care strategy to improve the quality of care.

INTRODUCTION

The puerperium, which lasts 6 weeks, is the period of time between child delivery and the recovery of the postpartum woman's organs, except the mammary glands, to their normal non-pregnant state.¹ Dietary taboos are traditional or cultural norms

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This study used a mixed data collection approach to gain a comprehensive understanding of the topic.
- ⇒ The designed questionnaire for assessing food consumption tendencies adheres to both international standards and regional characteristics.
- ⇒ The study is limited by relatively small sample sizes, potentially introducing bias due to individual differences.

that prohibit or discourage the consumption of certain types of food.² The existence of taboos serves to accommodate the diverse concepts of the world, thereby mitigating social disorder to some extent. When confronted with ambiguity, it is often advisable to categorise such matters as sacred.³ Specific taboos exist globally due to various reasons and dietary practices specific to different regions and population groups. Studies have revealed various dietary and behavioural taboos during pregnancy and childbirth worldwide under diverse cultural influences aimed at safeguarding maternal and infant health by avoiding certain foods. But such traditions could lead to inadequate nutrient intake.^{4,5}

In South China, many puerperal women still adhere to the tradition of 'sitting the month', which prescribes specific dietary behaviours for at least 30 days after delivery. The traditional dietary and hygiene behaviours have the main purpose of preventing 'postpartum illnesses' caused by improper care during this period.⁶ During this time, yuesao (a maternity matron who specialises in caring for the mother and newborn infant), as well as the woman's mother and mother-in-law, typically take care of the postpartum women and newborns.⁷ Relevant customs are also passed down during this period. In ancient times, it was already a widely accepted and strictly followed practice among women. The

exact year when this notion began to emerge is difficult to trace.

The cultural practice includes wind avoidance, consuming specific fruits and cold drinks and refraining from hair washing.^{8 9} Avoiding wind primarily refers to preventing postpartum women from being exposed to moving air, such as indoor air circulation caused by open windows or the breeze from fans. In traditional Chinese medicine, wind is considered one of the six factors that cause disease. It can invade the body through the meridians, leading to illness.¹⁰ According to traditional Chinese medicine, a woman's body is considered to be in a 'cold' state during the puerperium. Therefore, 'hot' foods are usually recommended. Consuming cold drinks and fruits is believed to exacerbate the 'cold' condition and disrupt the balance between hot and cold.¹¹ China's dietary guidelines for pregnant and lactating women state that the puerperal diet should be wellbalanced. That is varied but not excessive to adhere to a balanced nutritional profile throughout the lactation period.¹²

In addition to postpartum practices, dietary habits in South China are influenced by Lingnan culture, which distinguishes them from those in other regions of China. The cuisine in this area, known as 'Cantonese cuisine', is one of the eight major culinary traditions of China, characterised by a preference for steamed dishes and a sweet flavour profile.¹³ Cantonese slow-cooked soup (CSCS) is popular in Guangdong, China, and is consumed by Cantonese people worldwide as a delicious appetiser.¹⁴ Furthermore, the temperate and subtropical monsoon climate in this region affects the primary agricultural products, which differ from those in other parts of China. Rice is the staple food in South China, with lychees and longans being notable local fruits.

Due to different cultural backgrounds and regional habits, the taboos of puerperal diets in South China may be different from those in other regions. Therefore, this study aims to investigate the current status of dietary and hygiene behaviours among women in the puerperium in South China, analysing their influencing factors to provide a scientific and theoretical basis for maternal and child healthcare in this region.

METHODS

Study area

This study was conducted in the southern region of mainland China, that is, the area south of the Qinling-Huaihe line and the west of the Hong Kong Special Administrative Region. This region covers an area of approximately 2 400 000 km², accounting for about 25% of China's total land area. According to the seventh national census,¹⁵ the population of this region is approximately 640 million, mostly the Han ethnic group.

The urban-rural fringe occurs at the interface between rural and suburban regions, manifesting characteristics of both rural urbanisation and suburbanisation.¹⁶ Due to the disparities in urban and rural development, this

region exhibits significant differences in disease incidence and lifestyle habits compared with other areas.^{17 18} Additionally, the interdependence between urban and rural areas in this region often results in higher added value for agricultural products.

Sampling

This study conducted purposeful sampling for data collection from inpatient or outpatient settings at three tertiary hospitals in South China between November 2022 and March 2023. The three hospitals selected for this study are located in urban, rural and urban-rural fringe areas, respectively. These hospitals were chosen based on a comprehensive consideration of factors that could potentially influence the study outcomes, such as geographic location, population and socioeconomic development levels. The research population comprised postpartum women and their primary caregivers, selected through purposive sampling based on their perinatal experience. We did not include all individuals who met the criteria; rather, we selected participants based on the study's purpose and actual needs, ensuring that they were more representative of the study objectives.¹⁹

Tertiary hospitals play a crucial role in providing inpatient care within China's healthcare system.²⁰ These hospitals are defined as institutions with over 500 beds, indicating high annual delivery rates and a broader spectrum of patient demographics.²¹ Therefore, they can provide a sufficient sample size and a wide variety of sample types for this study.

Inclusion criteria: aged 18–35 years; elementary school education or above able to read and understand the questionnaire; understanding the purpose and significance of this questionnaire survey and voluntary participation. Exclusion criteria: dietary contraindications due to a history of severe allergies; psycho-cognitive disorders, inability to communicate or answer questions. For women who admitted not eating certain foods or following some taboos described in the questionnaire, we conducted further interviews with them or their primary caregivers to determine the reasons.

Research method

A presurvey with 25 postpartum women was conducted to validate the questionnaire's design and content and to ensure clarity. Feedback from this presurvey led to adjustments, including the addition of food aliases. The refined questionnaire was subsequently administered to 327 women for formal data collection. Participants completed the questionnaire on the spot using the Questionnaire Star app (www.wjx.cn), which prevented the submission of incomplete responses. Following data collection, respondents with food taboos or puerperium-related health behaviour, or their primary caregivers, were invited for further semistructured interviews. During the presurvey, researchers received standardised training to ensure they have sufficient

research or interview skills. A flowchart illustrating the sequence of events is provided in online supplemental material 1.

The interviews were conducted by a female post-graduate nursing researcher from South China who possesses a strong cultural background. Cantonese is her native language, enabling effective communication with research subjects from the same cultural background. To ensure objectivity, she had no prior relationship with the participants. Each interview was conducted in an outpatient clinic or postpartum ward under the guidance of an interview guide. For interviews with primary caregivers, we used the spare time when the puerperium women were undergoing routine checkups. After fully informing the interviewees about the location, required time and obtaining their consent, the interviews were carried out in the form of one-on-one conversations. Each interview lasted 15–30 min. The audio recording was made throughout the interview with the consent of the participant.

During the research phase, data saturation occurs when newly collected data redundantly duplicates existing data.²² At this stage, further interviews will be halted, and our focus will shift exclusively to data analysis.

Research tools

General information questionnaire

Designed by the researcher, this questionnaire involved age, education, native place, attributes of resident, religious belief, average monthly household income, occupation and primary caregiver(s) during the puerperium.

Puerperium-related diet questionnaire

The Minimum Dietary Diversity for Women (MDD-W)^{23 24} was developed by the Food and Agriculture Organisation of the United Nations (FAO) as a key dimension of diet quality for women of reproductive age. Since the indicator was launched in 2015, 55 countries have collected MDD-W data—11 at the country level and 44 at the sub-country level—for research or impact assessment. The MDD-W indicator has been included in FAO's annual report 'The State of Food Security and Nutrition in the World' since 2020.

The Chinese Food Guide Pagoda (2022)²⁵ visual representation of the Chinese residents' balanced diet pagoda adheres to the principles of a balanced diet and embodies the ideal nutritional composition of basic food.

A puerperal diet questionnaire was designed based on MDD-W and the Chinese Food Guide Pagoda (2022). The contents include five major categories of foods: cereals and potatoes, vegetables and fruits, animal food groups, dairy and legumes, and cooking oils and condiments, under which a number of common representative food groups were listed. The Cronbach's α coefficient of the questionnaire was 0.899, and the Kaiser-Meyer-Olkin (KMO) value was 0.849, with $p < 0.001$.

Puerperium-related health behaviour questionnaire

Based on the preliminary survey, analysis and summary of related literature, the hygiene behaviours were categorised into three major categories: environmental events, personal care events and customs and habit events. The options were categorised into five levels using a five-point Likert scale: 'definitely don't do it', 'most likely don't do it', 'not sure', 'most likely will do it' and 'definitely do it' and were recorded as 1, 2, 3, 4 and 5, respectively. The Cronbach's α coefficient was 0.659, and the structural validity KMO value was 0.751, with $p < 0.001$.

Interview guide

The interview guide (online supplemental material 2) was based on the conceptual framework of a literature review and group discussion. Factors that affect postpartum women's dietary and hygiene behaviours in puerperium are extracted (figure 1) according to the literature review,^{26 27} which were 'belief', 'dietary practices', 'personal attitude', 'hygiene habits' and 'support'. The specific interview questions were related to these factors. The guide was reviewed by two experts in the field of women's health to verify the effectiveness of the survey contents and confirm the relevance and adequacy of the scope of the question.

Statistical methods

Excel 2016 and IBM SPSS V.25.0 software were used for data entry and analysis, respectively. The count data were described as frequency and percentage. Dietary and hygiene contraindications of puerperal women in South China were presented in the form of tables in the appendices. Dietary differences across demographics and various food groups were analysed by the χ^2 of single variables. The screened variables (see online supplemental material 3 and online supplemental material 4) were included in the multinomial logistics regression analysis. The method of variable entry was backward, and the specific method for assigning independent variables is detailed in online supplemental material 5. The results of the practice of food taboos were categorised as yes (for those who practiced) and no (for those who did not) as the dependent variable. The results of the regression analyses were expressed as OR, providing 95% CIs with a significance level of < 0.05 .

Data were organised using QSR NVivo 12 qualitative software to facilitate thematic analysis. After the interviews, the audio recordings were converted into text by two authors within 24 hours. The interview text was translated from Chinese to English by an independent translator. To ensure the accuracy of the translation and the rigour of meaning interpretation, the researcher conducted a review of the translation process.

Ethical considerations

This study involves human participants. All participants provided written consent at the time of recruitment and verbally confirmed their consent again during qualitative

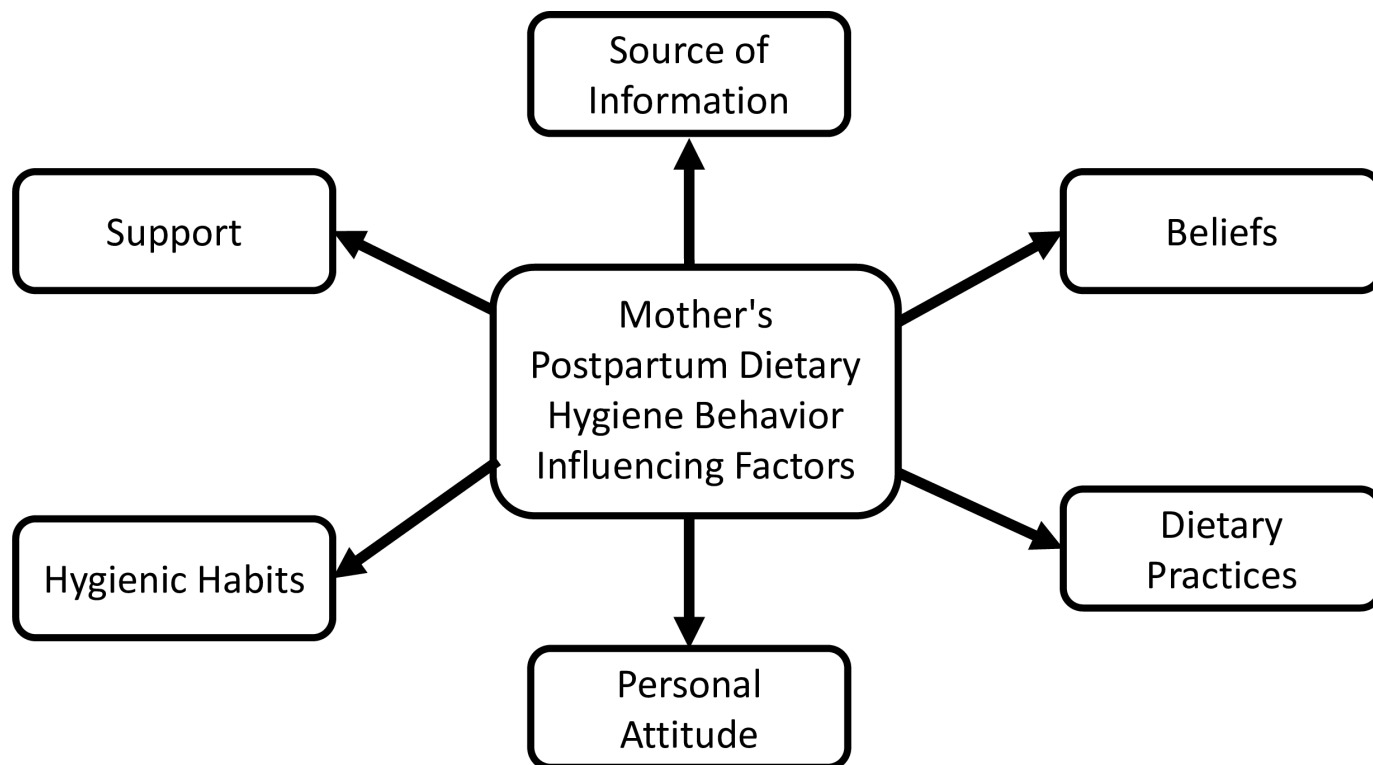


Figure 1 Framework of factors affecting postpartum women.

interviews. This study has been approved by the Medical Research Ethics Committee of Guangzhou University of Chinese Medicine Dongguan Hospital (Ethics Approval Number: (2023) 38). Participation in the research was entirely voluntary and did not involve any economic incentives. All information was and will be kept strictly confidential, and pseudonyms were used for statistical analysis and audio data transcription.

Patient and public involvement

None.

RESULTS

Results of quantitative data

General information of study participants

In this survey, a total of 327 participants were recruited. However, four participants were excluded due to insufficient response time or incomplete information. Therefore, the final analysis included data from 324 participants. Data analysis found that most survey respondents were in the age group of 25–29 years (129, 39.94%), followed by those aged 30–34 years (108, 33.44%). The rest of the data are detailed in [table 1](#).

Postpartum women's food consumption tendency and influence factors

For vegetables and fruits, the top three were watermelon, persimmons and mango, accounting for 52.6%, 41.2% and 40.9%, respectively. Simultaneously, the proportion of locally renowned longan and lichee that were inedible was relatively high, standing at 36.5% and

35.9%, respectively. Some people held that animal blood (16.4%) and animal liver (16.1%) under the category of meat dishes should be avoided. See online supplemental material 6 for details.

The results of regression analysis ([table 2](#)) showed that women residing in urban-rural fringes (OR 5.333, 95% CI 2.001 to 14.218) and villages (OR 3.264, 95% CI 1.085 to 9.823) in southern China were more likely to consume brown sugar. Besides, respondents with husbands as primary caregivers during the puerperium showed a higher inclination to consume watermelon (OR 2.235, 95% CI 1.119 to 4.463), persimmons (OR 4.395, 95% CI 1.886 to 10.242) and longan (OR 2.612, 95% CI 1.362 to 5.010).

Postpartum women's health-related behaviour and influence factors

For environmental events, the number of people who tended to room ventilate during the puerperium (the sum of those who selected 'most likely to do it' and 'definitely to do') was 297, accounting for 91.9% of the total respondents. In custom events, 58.80% and 65.90% of the participants tended to smoke wormwood and have ginger shampoo, respectively. In addition, 61% of them would eat pig's trotter vinegar (a traditional puerperal food in South China) during puerperium. See online supplemental material 7 for details.

Multinomial logistics regression analysis showed that women who reside in urban-rural fringe were more inclined to use ventilated rooms (OR 4.496, 95% CI 2.363 to 8.552) and avoid hair washing (OR 0.345, 95% CI 0.159

Table 1 Social-demographic information of participants (n=323)

Characteristics	N (%)
Age (years)	
≤24	29 (8.98)
≥35	57 (17.65)
25–29	129 (39.94)
30–34	108 (33.44)
Highest education	
Primary school and below	4 (1.24)
Middle school	61 (18.89)
High school	71 (21.98)
Undergraduate	180 (55.73)
Postgraduate and above	7 (2.17)
Long-term residence	
City	158 (48.92)
Urban-rural fringe	92 (28.48)
Village	73 (22.60)
Religious belief	
Buddhism	34 (10.53)
Christianity	5 (0.02)
Christianity and Buddhism	1
Other (Chaoshan Grandpa)	1
None	282 (0.87)
Monthly household income (yuan)	
4000–5999	56 (17.34)
6000–7999	59 (18.27)
8000–10000	112 (34.67)
>10000	96 (29.72)
Occupation	
Working	247 (76.47)
Housewife	76 (23.53)
Postpartum care provider	
Husband	72 (22.29)
Elders	188 (58.20)
Maternity matrons	63 (19.50)
Place of residence during puerperium	
Home	291 (90.09)
Maternity hotels	32 (9.91)
The main source of dietary contraindications during pregnancy	
Suggestion from the elderly	124 (38.39)
Religious beliefs	9 (2.79)
Local customs	41 (12.69)
Personal habits	149 (46.13)

to 0.749) during the puerperal period than those who live in the city. Additionally, women who practiced Buddhism were more likely to wash their hair (OR 11.070, 95% CI 2.339 to 52.379) and take baths (OR 6.856, 95% CI 2.057 to 22.855) during the postpartum compared with those with no religious affiliation. The specific results are shown in [table 3](#).

Qualitative data results

Six pregnant women and five primary caregivers participated in semi-structured interviews. Through theme analysis, five themes were extracted.

Theme 1: dietary practices

Eat regularly and high protein

Most interviewees expressed that more attention would be paid to the regularity and health of diet during puerperium than usual. They would selectively adopt a high-protein and high-fibre diet and avoid eating junk food.

M2 ‘Puerperal high-protein diet, the diet law will be a little more regular, and fruit meals will be increased. Eat less junk food, and I haven’t eaten my usual snacks’.

M4 ‘We will try our best to eat regularly and healthily during the puerperium’.

Avoid using ‘cold’ food

In China, many women can be exposed to the theory of physique advocated by traditional Chinese medicine, which holds that foods that are too “cold” will conflict with pregnancy. Some pregnant women and their families will pay attention to avoid consuming such foods.

M1 ‘The crab is too cold, and then what will happen to that hawthorn?’.

M6 ‘The diet is basically the same as before pregnancy, but persimmon crabs are cold and will be forbidden’.

At the same time, they will also adopt a traditional puerperal diet under the care of their elders, and the reasons are shown in the online supplemental material 8.

Theme 2: hygiene habits

Avoid wind exposure

Most of the respondents said that the puerperal period would focus on avoiding wind exposure.

G2 ‘There is no hair dryer. Try not to open the window at home. If you go out, you should close the window before going out. Sometimes the living room needs ventilation, so let them close the window before going out’.

F1 ‘Don’t expose to wind, try not to get cold’.

Wash hair or bathe with ginger or mugwort leaves

Most respondents reported that they no longer follow the traditional custom of not bathing or hair washing, but would make selective changes, such as reducing the

Table 2 Multiple regression analysis of factors influencing food consumption types in puerperal women (n=323)

Dependent variable	Influencing factor	Partial regression coefficient	SE	P value	OR	95% CI
Vegetables and fruits						
Persimmon	Monthly household income level: 8000–10 000 Yuan	−0.940	0.386	0.015	0.391	0.183 to 0.834
	Home	1.629	0.810	0.044	5.099	1.042 to 24.949
	Husband	1.481	0.432	0.001	4.395	1.886 to 10.242
Watermelon	Monthly household income level: 8000–10 000 Yuan	−0.776	0.310	0.012	0.460	0.251 to 0.844
	Husband	0.804	0.353	0.023	2.235	1.119 to 4.463
Longan	Monthly household income level: 4000–5999 Yuan	0.911	0.396	0.022	2.487	1.144 to 5.408
	Husband	0.960	0.332	0.004	2.612	1.362 to 5.010
Amaranth	Monthly household income level: 4000–5999 Yuan	1.469	0.436	0.001	4.343	1.849 to 10.198
Condiments						
Brown sugar	Village	1.183	0.562	0.035	3.264	1.085 to 9.823
	Urban-rural fringe	1.674	0.500	0.001	5.333	2.001 to 14.218

number of shampoos, washing hair or bathing with ginger or mugwort leaves.

M4 ‘My mother-in-law may not let me wash my hair. Like after delivering the previous baby, she didn't allow me to wash it once every half month, but I still secretly did it. She would help me boil ginger water and wash my hair’.

G1 ‘Wash your hair with ginger before the full moon. The old man said that washing your hair with ginger can be beneficial for blood vessels and protects against headaches’.

F1 ‘We don't take a shower there, so we wipe our bodies with hot towels’.

F2 ‘We will also wash our hair with wormwood or ginger bark to dispel the wind’.

Theme 3: personal attitude

No attention

We interviewed pregnant women about their attitudes towards customs and habits, and some pregnant women said they didn't understand the traditional customs, and their eating behaviour was the same as that before pregnancy.

M3 ‘didn't follow these, all are the same as before pregnancy’.

M4: ‘... they said they couldn't take a bath, but I don't care and secretly take a bath...’.

Listen to suggestions appropriately

Some respondents also said that they would learn about relevant customs, but they would do it selectively.

Table 3 Multiple regression analysis of influencing factors of puerperal women's health behaviour (n=323)

Dependent variable	Influencing factor	Partial regression coefficient	SE	P value	OR	95% CI	
Environmental events	Room ventilation	Urban-rural fringe	1.395	0.313	<0.001	4.035	2.184 to 7.454
Personal care events	Hair washing	Urban-rural fringe	−1.065	0.396	0.007	0.345	0.159 to 0.749
		Buddhism	2.404	0.793	0.002	11.070	2.339 to 52.379
	Bathing	Buddhism	1.925	0.614	0.002	6.856	2.057 to 22.855
		Monthly household income: 4000–5999 yuan	1.461	0.639	0.022	4.310	1.233 to 15.066
Customs and habits events	Crucian carp soup	Village	0.738	0.366	0.043	2.092	1.022 to 4.282
		Monthly household income: 4000–5999 yuan	−1.479	0.427	0.001	0.228	0.099 to 0.527

M2 'I think it's appropriate. Anyway, imagine that I don't want to decorate my home after I hear about pregnancy. I'll pay attention to it when I know it. It's better to believe it than not. Then, like what to eat in confinement, it's more scientific now, that is, it can be done with good nutrition. Just eat properly, you can't say that you eat every day just listen properly'.

A pregnant woman who is used to eating spicy food said:

M8 'I think it alright to tell me to eat less spicy. If you tell me can't eat even a little bit, I won't even take in anything'.

Theme 4: sources of information

In the interviews, the majority of respondents indicated that they obtained relevant information from elders and yuesaos. A smaller portion mentioned receiving information from other sources, such as social media and healthcare professionals.

M3, M6 and F1 '... listen to Yuesao's suggestion...'

M2 'Mainly listen to the doctor's opinion, rarely from some media or friends...'

Theme 5: support

Most interviewees reported that they can get care from maternity matron and their elders at home during the puerperium. A few respondents mentioned receiving help from friends with childbirth experience.

M2 'My friends who gave birth would help me out'.

M4, M5 and F2 'My mother-in-law/My mother would assist us in caring for the newborn...'

M3, M6 and F1 'We hired Yuesao to help...'

DISCUSSION

More taboos on vegetables and fruits, less on meat

This study found that certain fruits, such as 'cold' persimmons and watermelons, and 'hot' fruits like mangoes and longans, were considered inedible by a significant proportion of local postpartum women, each exceeding 35%. This is consistent with the findings from the qualitative research. This perception might be associated with the traditional Chinese medicine concept of balancing yin and yang within the body.^{28 29} Research from other countries suggests that the primary reason for avoiding these fruits and vegetables is the perception of their high sugar content, which may lead to obesity and difficult childbirth for infants.³⁰ However, multiple studies suggest that the intake of fresh vegetables and fruits promotes bowel movements, prevents constipation and increases the vitamin and mineral content in breast milk.³¹ Effectively disseminating accurate nutrition-related knowledge concerning mother–infant health to postpartum women and caregivers is an urgent priority.

Compared with the studies of other districts, there were fewer taboos on meat consumption in South China.

Studies from other areas have reported that postpartum women may also encounter complications similar to those experienced by animals before or after childbirth, including miscarriage and difficult childbirth.³² Eggs are believed to cause infant baldness³³ or macrosomia.³⁴ This study has not yet yielded quantitative results related to meat consumption. Similarly, most interviewees indicated a preference for high-protein diets. This may be related to the traditional postpartum confinement diet of high meat and low vegetables.³⁵

Compared with previous studies,³⁶ this study found that postpartum women in the South China region have shown an increased intention to consume vegetables and fruits. There are two possible reasons for this phenomenon. First, most of the surveyed population in this study have received higher education (bachelor's degree or above) and resided in urban or urban-rural fringe areas, where health literacy and living standards are relatively higher.³⁷ Second, with the popularisation of mobile phones and the establishment of internet hospitals, Chinese people have increasingly diverse channels to access healthcare-related knowledge.³⁸

Current status of traditional practices and positive improvements

Postpartum hygiene behaviours of postpartum women are still influenced by the traditional custom of 'sitting the month' in South China. This study found that the traditional harmful customs followed by puerperium women mainly included lack of room ventilation, not washing hair and avoiding bathing, accounting for 4%, 59.4% and 68.4%, respectively. This is consistent with the findings of previous studies.³⁹ Research has shown that lack of ventilation in the room can lead to decreased air quality, bacterial growth and an increased risk of respiratory infections.⁴⁰ Refraining from hair washing and bathing may also exert a discernible impact on the mother's emotional well-being.⁴¹ Besides, women who lived in urban-rural fringe areas were more likely to avoid washing hair and ventilating rooms during the puerperium compared with those living in the city. The fact may be that the health awareness and education levels of residents in urban-rural fringe areas were between those of urban and rural residents.^{42 43} However, due to geographic factors, they were not as likely as urban residents to avoid ventilation out of concern for air pollution or privacy issues caused by close building proximity.

The development of traditional Chinese medicine has led to an increasing acceptance of postpartum rehabilitation methods using Chinese herbal medicine, such as wormwood and medicinal ginger.^{44 45} Many investigators revealed that adding ginger when washing hair during the puerperium period is beneficial for 'dispelling cold' and preventing hair loss. Research has shown that hair washing combined with ginger juice scalp massage could significantly improve the physical and mental status, thus enhancing the quality of life of postpartum women.⁴⁶ It can be seen that traditional customs have a significant

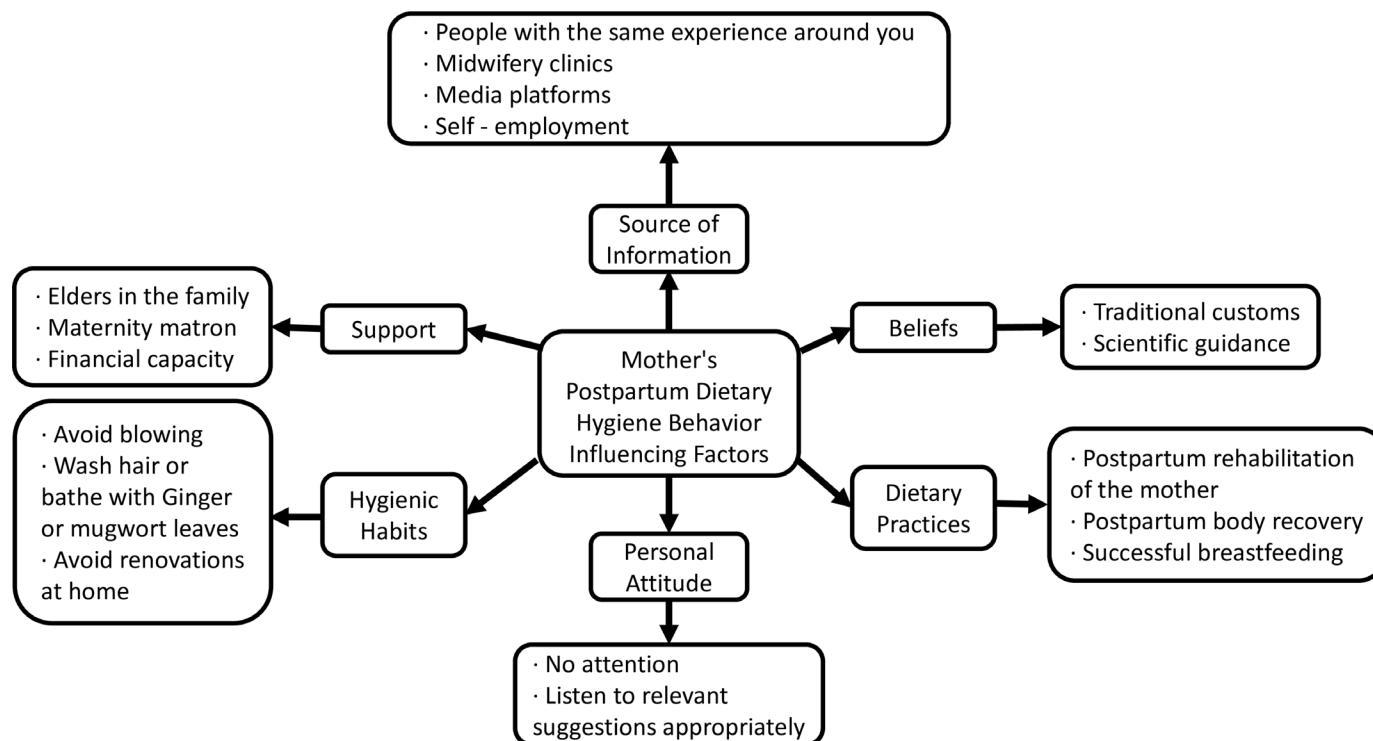


Figure 2 The framework after adding the study results.

impact on personal care and environmental hygiene, and the emerging field of traditional Chinese medicine nursing may be an important measure to help reconcile old and new cultures.

Sources of postpartum taboos during the postpartum period

In this study, we extracted a framework of factors influencing maternal postpartum dietary behaviour and conducted research based on this framework. The research findings provide further evidence for the framework (figure 2). This framework enhances the understanding of factors influencing maternal postpartum dietary behaviour and identifies specific reasons that influence such behaviour.

Quantitative results showed that women who practice Buddhism were more inclined to wash their hair and take baths compared with those with no religious affiliation. This may be related to Buddhist ritual culture. Studies reveal that 'bathing and dressing' is often the first step in an important ritual for Buddhist believers.^{47 48}

According to the statistics on the preferences and guidance sources for postpartum diet, the top two sources were advice from elders (38.4%) and personal habits (46.1%), which is consistent with the qualitative results. Qualitative findings also indicated that postpartum women in South China often adhere to arrangements made by primary caregivers, such as yuesaos and elders. This may be related to the deep influence of Confucian cultural values among the Chinese, which emphasise harmony and respect for elders. Besides, postpartum women whose primary caregiver is their husband tend to consume foods such as persimmons and longans,

which are traditionally considered foods to be avoided according to elders. This also aligns with the qualitative findings of the theme 'personal attitudes' in this study. The proportion of personal habits and opinions during the postpartum period has increased, which is consistent with the findings of multiple studies.^{49–51}

Based on the above, the following recommendations are proposed. First, attempt to adjust relevant traditional customs with a scientific and rigorous approach to meet the adherence to these traditions by the elders. This will enable pregnant and postpartum women to maintain a harmonious family environment. For example, adding ginger to shampoo to fulfil the need for 'feng-fang' (prevent cold) and suggesting fruits after soaking in warm water. Additionally, when conducting popular science education, the primary caregivers during the postpartum period should be considered as part of the target audience for education. At the juncture where old traditional customs coexist with new scientific guidelines, it is essential to discern and integrate accurate information, guiding new families correctly in maternal and child healthcare.

Limitations of this study

Due to practical considerations and financial constraints, the survey participants in this study were limited in number. The sample obtained through purposeful sampling represents a portion of the mobile population in the area. However, individual differences might introduce biases, particularly in remote areas with limited representation. The COVID-19 pandemic has had a certain impact on the postpartum lifestyle of women, resulting in some

differences compared with non-pandemic times. This could potentially affect the research results.

CONCLUSION

Dietary and hygiene taboos among postpartum women in South China persist but have evolved with social development. Long-term resident and primary caregivers have a more extensive impact on these practices. It is necessary for healthcare professionals to provide targeted postpartum hygiene guidance to populations in different regions to improve maternal and infant health and outcomes. Additionally, health educators should target primary caregivers in their educational efforts to ensure that relevant scientific guidance is effectively implemented.

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Competing interests None declared.

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Patient consent for publication Not applicable.

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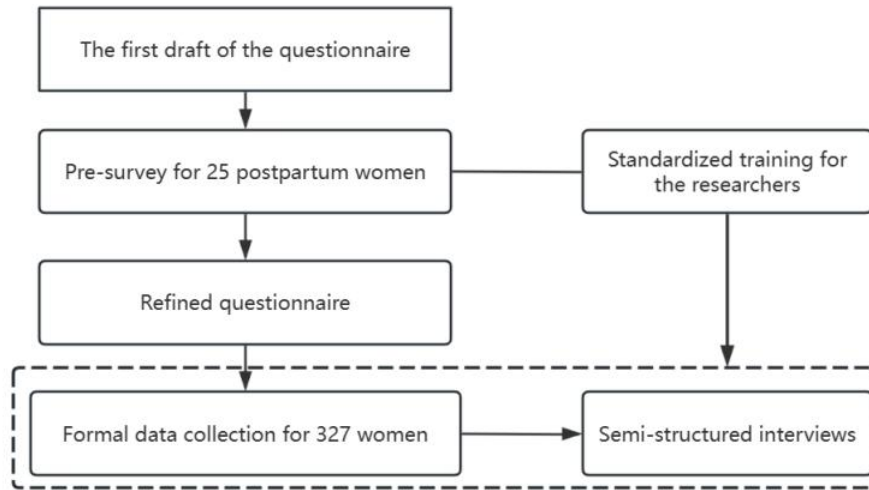
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Supplemental material 1. The flowchart of the sequence of research events

Supplemental material 2. The Interview Guide

Interview Guides

Name of the study:

Dietary habit and lifestyle of postpartum women in South China

Introduction:

The purpose of this interview guide is to deeply understand Dietary habit and lifestyle of postpartum women in South China, provide detailed data support for related research, and provide scientific basis for postpartum women's health management and guidance. Through this interview, we will focus on the eating habits, nutritional intake, and hygiene behaviors of postpartum women.

Purpose of interview:

1. Explore the sources of information related to postpartum women during the puerperium.
2. Understand postpartum women's health behaviors and habits, including personal hygiene, home environment and infant care.
3. Collect postpartum women's eating habits and special postpartum meals.
4. To understand the knowledge and attitudes of maternal women and their caregivers and health behaviors.
5. Understand the sources of support postpartum women receive during the puerperium.

Informed Consent:

Prior to the interview, researchers should fully explain the purpose of the study to the study subjects and obtain their informed consent before conducting the interview. The contents that need to be explained include: interview time, interview purpose, possible content involved, recording permission, and data confidentiality instructions.

Interviewees

Inclusion criteria: aged 18 to 35 years; elementary school education or above, able to read and understand; understanding the purpose and significance of this interview, voluntary participation. Exclusion criteria: dietary contraindications due to a history of severe allergies; psycho-cognitive disorders, inability to communicate or answer questions.

For women who admitted not eating certain foods or following some taboos described in the questionnaire, we conducted this interview with them or their primary caregivers to determine the reasons.

Main Questions

1. "What are the sources of dietary behavior taboos related to your puerperium?"
2. "What dietary habits do you practice/are aware of?"
3. "What is your personal attitude towards these dietary and hygiene behavior taboos?"
4. "What hygiene practices do you follow/are aware of during the puerperium?"
5. "What support did you receive/provide during the puerperium?"

Additional Comments:

An opportunity for the participant to add any additional information or thoughts.

Thank You:

A statement thanking the participant for their time and contribution.

Practical Details:

- **Interview Duration:** The interview is expected to take 15-30 mins.
- **Interview Format:** Whether the interview will be conducted in person
- **Interview location:** Ward or outpatient doctor's office

Interview skills

- ✓ **Building trust:** At the beginning of the interview, the purpose and importance of the interview were introduced to the respondents to establish a relationship of trust.
- ✓ **Open-ended questions:** Use open-ended questions whenever possible to encourage respondents to elaborate on their views and experiences.
- ✓ **Listening and feedback:** Listen carefully to the answers of the interviewees, give feedback and affirmation in time, and keep the atmosphere of the interview positive and harmonious.
- ✓ **Respect for privacy:** During the interview, the privacy and wishes of the respondents were respected and sensitive or uncomfortable topics were avoided.

Supplemental material 3. Chi-Square Test of Food Consumption in Women during the Puerperium

Characteristic 1	Characteristic 2	χ^2	P Value		
Cereals and potatoes	Sweet potato	Place of residence during puerperium	6.319	0.042	
		Postpartum care provider	12.879	0.012	
	Potato	Long-term residence	12.811	0.012	
		Religious belief	16.153	0.040	
	Oats	Religious belief	20.956	0.007	
		Monthly household income level	12.669	0.049	
Vegetables and fruits	Millet	Religious belief	20.057	0.010	
	Chinese cabbage	Age	14.071	0.029	
		Religious belief	23.590	0.003	
		Monthly household income level	17.929	0.006	
	Persimmon	Place of residence during puerperium	7.322	0.026	
		Postpartum care provider	26.482	<0.001	
		Monthly household income level	19.884	0.003	
	Watermelon	Postpartum care provider	12.778	0.012	
		Grape	Place of residence during puerperium	4.153	0.042
			Long-term residence	9.483	0.050
	Monthly household income level		7.308	0.026	
	Mango	Postpartum care provider	15.506	0.004	
		Longan	Postpartum care provider	16.954	<0.001
			Monthly household income level	19.512	0.003
	Lichee		Age	12.879	0.045
Banana	Long-term residence	5.975	0.050		
Amaranth	Long-term residence	6.646	0.036		
	Monthly household income level	17.564	0.007		
	Meats	White meat	Highest education	15.633	0.048
Red meat		Religious belief	27.742	0.001	
		Highest education	23.260	0.003	

Supplemental material 3. Chi-Square Test of Food Consumption in Women during the Puerperium (Continued)

Characteristic 1	Characteristic 2	χ^2	P Value	
Meats	Red meat	Monthly household income level	13.723	0.033
	Animal liver	Monthly household income level	19.849	0.003
	Animal blood	Postpartum care provider	10.076	0.039
	Animal blood	Postpartum care provider	10.645	0.031
	Cheese	Postpartum care provider	12.090	0.017
Dairy and legumes	Adzuki	Highest education	16.464	0.036
	Coix seed	Long-term residence	10.248	0.036
		Postpartum care provider	11.714	0.020
	Mung bean	Monthly household income level	13.579	0.035
Place of residence during puerperium		6.016	0.049	
Cooking oils and condiments	Blending oil	Long-term residence	14.460	0.006
		Age	15.859	0.015
		Monthly household income level	16.009	0.014
	Corn oil	Religious belief	16.155	0.040
		Sichuan pepper	Long-term residence	9.732
	Brown sugar	Long-term residence	14.329	0.006
		Postpartum care provider	12.117	0.017
		Monthly household income level	12.746	0.047
		Postpartum care provider	10.440	0.034

Supplemental material 4. Chi-Square Test of Puerperal Women Health Behaviors

Characteristic 1	Characteristic 2		χ^2	P Value
Environmental events	24-hour air conditioning	Long-term residence	17.500	0.025
		Place of residence during puerperium	13.100	0.011
	Room ventilation	Long-term residence	26.172	0.001
Personal care events	Brushing	Long-term residence	16.992	0.030
		Religious belief	30.850	0.014
	Hair washing	Long-term residence	20.294	0.009
		Religious belief	38.730	0.001
	Bathing	Religious belief	34.820	0.004
		Monthly household income level	25.591	0.012
Customs and habits events	Smoked wormwood	Monthly household income level	25.784	0.012
		Religious belief	34.503	0.005
	Drinking	Postpartum care provider	16.959	0.031
		Pig's trotter	Highest education	27.105
	vinegar	Long-term residence	15.988	0.043
		Drinking rice wine	Highest education	31.273
	Papaya fungus soup		Age	35.243
		Highest education	27.837	0.033
		Long-term residence	19.942	0.011
	Crucian carp soup	Monthly household income level	25.748	0.012
		Long-term residence	15.820	0.045
		Monthly household income level	25.624	0.012
	Millet gruel	Religious belief	37.207	0.002
Monthly household income level		21.803	0.040	

Supplemental material 5. Argument Assignment Table

Argument	Assignment Method
Highest education	Primary school and below = 1, Middle school = 2, High school = 3, Universities = 4, Graduate students and above = 5
Age (Years)	≤ 24 = 1, 25-29 = 2 30-34 = 3, ≥35 = 4
Long-term residence	Village = 1, Urban-rural fringe = 2, City = 3
Religious belief	Buddhism = 1, Christianity = 2, Christianity and Buddhism = 3, Other [Chaoshan Grandpa] = 4, None = 5
Monthly household income level(yuan)	4000-5999 = 1, 6000-7999 = 2, 8000-10,000 = 3, >10,000 = 4
Place of residence during puerperium	Home = 1, maternity hotel = 2
Postpartum care provider	Husband = 1, yuesao = 2, Parents-in-law/parents = 3

Supplemental material 6. Percentage of women's willingness to consume each food group during puerperium in south China ($n = 323$)

Type	Cereals and potatoes (%)				Vegetables and fruits (%)								Animal foods group (%)					
	Millet	Oats	Rice	Sweet potato	Potato	Persimmon	Watermelon	Mango	Longan	Grape	Banana	Lichee	Amaranth	Chinese cabbage	Animal blood	Animal liver	Red meat	White meat
Inedible	7.4	5.9	2.2	11.5	6.8	41.2	52.6	40.9	36.5	5.9	9.0	35.9	23.8	7.7	16.4	16.1	6.5	3.1
Uncertain	4.6	7.1	2.8	11.8	10.5	25.4	12.1	15.2	14.2	4.6	3.7	16.7	18.9	3.7	23.8	16.7	4.6	3.4
Edible	87.9	87.0	95.0	76.8	82.7	33.4	35.3	44.0	49.2	89.5	87.3	47.4	57.3	88.5	59.8	67.2	88.9	93.5

Supplemental material 6. Percentage of women's willingness to consume each food group during puerperium in south China (Continued)

Type	Dairy and Legumes (%)							Cooking oils and condiments (%)								
	Milk	Goat milk	Cheese	Adzuki	Mung bean	Coix seed	kuromame	Peanut oil	Corn oil	Blending oil	Olive oil	Pepper	Sichuan pepper	Monosodium glutamate (MSG)	Brown sugar	Sugar
Inedible	1.9	6.2	22.0	5.3	21.4	22.6	8.4	2.2	9.0	26.6	6.5	56.0	63.5	55.7	9.3	11.1
Uncertain	1.9	11.5	18.6	5.3	14.6	15.8	4.6	2.8	5.6	11.1	6.5	12.4	13.6	15.5	6.8	10.8
Edible	96.3	82.4	59.4	89.5	64.1	61.6	87.0	95.0	85.4	62.2	87.0	31.6	22.9	28.8	83.9	78.0

Supplemental material 7. Percentage of puerperal women's health-related health behaviors in south China (n = 323)

Type	Environmental events (%)				Personal care events (%)			
	24-hour air conditioning	Turn on the fan frequently	room ventilation	Outdoor activities	Foot soaking	Wash hair	No brushing	No bathing
Definitely don't do it	24.1	54.5	2.8	28.8	4.0	36.5	2.2	43.0
Most likely don't do it	22.0	7.7	1.2	14.9	9.0	22.9	3.1	25.4
Not sure	18.3	10.5	4.0	11.8	10.5	11.5	4.6	11.5
Most likely will do it	29.7	23.8	23.5	20.7	32.5	21.7	17.3	12.7
Definitely do it	5.9	3.4	68.4	23.8	44.0	7.4	72.8	7.4

Supplemental material 7. Percentage of puerperal women's health-related health behaviors in south China (Continued)

Type	Customs and habits events (%)							
	Ginger shampoo	Smoked wormwood	Drinking	Eat pork foot ginger	Drinking rice wine	Papaya fungus soup	Crucian carp soup	Millet gruel
Definitely don't do it	4.6	7.1	77.4	9.0	27.6	6.2	1.9	6.2
Most likely will do it	33.7	35.0	3.7	46.1	16.1	37.5	40.9	32.8
Not sure	16.1	21.1	5.9	16.1	15.5	24.8	13.6	10.5
Most likely don't do it	13.3	13.0	12.4	13.9	31.9	8.0	8.7	13.3
Definitely do it	32.2	23.8	0.6	14.9	9.0	23.5	35.0	37.2

Supplemental material 8. Traditional Puerperal Food that Puerperal Women Would Eat under the Care of Elders

Specific Food	Reason	Respondents
Boiled chicken in glutinous rice wine	We would have some brewed wine boiled chicken. Brewed wine is glutinous rice wine, elders said that will be very replenishing for postpartum women.	M2
Chicken soup	Very complementary and good for postpartum women. Help them recovery well.	G1
Flour paste (A snack made with a mixture of flour and eggs)	It replenishes blood and help a lot in recovery	M5
Pig's trotter vinegar	This dish replenishes blood and stimulates the human milk production. Ginger repels cold. It's very complementary to postpartum women, we eat like this during confinement, and send it to the neighborhood to share the happiness.	F1, F2, G2