

Postprint: Intention to Use Traditional Chinese Medicine and Its Influencing Factors Among Pregnant and Postpartum Women

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Abstract

Abstract

Background: Traditional Chinese medicine (TCM) possesses profound theoretical foundations and extensive practical applications in maternal and child health, with active state promotion of TCM initiatives in this domain. However, issues such as insufficient knowledge of perinatal TCM and limited awareness of its safety among pregnant and postpartum women pose significant challenges to advancing TCM in maternal and child health. Strengthening research on TCM utilization behavior among maternal women is therefore crucial for enhancing the effective delivery of TCM services.

Objective: To understand the current utilization status and intention of TCM use among maternal women, and to explore the factors influencing their TCM utilization intention.

Methods: From June to October 2023, we conducted a cross-sectional study recruiting pregnant and lactating women receiving maternal health care services at maternal and child health institutions across multiple regions of the country for a questionnaire survey. Based on the extended Theory of Planned Behavior (with previous TCM utilization experience added as a covariate), we designed a structured questionnaire to assess the four core variables of the Theory of Planned Behavior (subjective norm, behavioral intention, perceived behavioral control, attitude) and variables related to previous TCM utilization. Statistical analysis was performed using SPSS 20.0 and AMOS 26.0, and a structural equation model was constructed to explore path relationships among variables.

Results: A total of 264 questionnaires were distributed, with 264 valid questionnaires recovered, yielding a 100% valid response rate. Ninety-nine (37.5%) maternal women used TCM during the perinatal period.

Multivariate logistic regression analysis showed that pregnancy stage (OR=0.519, 95%CI=0.386~0.697) and previous TCM utilization history (OR=9.399, 95%CI=4.500~19.633) were significant influencing factors of TCM utilization among maternal women (P<0.05). The surveyed maternal women demonstrated relatively positive attitudes toward TCM utilization [(5.49±1.13)points], high intention to use TCM [(4.95±1.04)points], high perceived behavioral control over perinatal health care [(4.95±1.04)points], and subjective norms exerting the greatest influence (β=0.435, P=0.001).

Conclusion: The utilization rate of TCM among maternal women in China is low, with regional disparities in TCM service utilization, and TCM utilization intention is readily influenced by the opinions of significant others and previous TCM utilization experiences. It is necessary to implement tailored policies, deepen reform of TCM service models for maternal women, place greater emphasis on subjective norms regarding TCM utilization in perinatal health care services, and accelerate the construction of whole-life-cycle TCM services. These measures would promote the application of TCM services for maternal women and advance TCM initiatives in the field of maternal and child health.

Full Text

Introduction

Traditional Chinese Medicine (TCM) represents a treasure of ancient Chinese science that has made tremendous contributions to the survival and prosperity of the Chinese nation. In the context of modern medicine, the inheritance and innovative development of TCM constitutes an important component of the socialist cause with Chinese characteristics [1]. TCM possesses a profound theoretical foundation in the field of maternal and child health, with extensive practical application and demonstrated efficacy in perinatal healthcare areas such as preconception care, hyperemesis gravidarum, threatened miscarriage, gestational hypertension, postpartum depression, and lactation insufficiency [2]. To fully leverage the unique role of TCM in maternal and child health care and to implement national strategic plans for promoting the inheritance and innovative development of TCM, the National Health Commission and the National Administration of Traditional Chinese Medicine jointly issued the “Implementation Plan for Promoting Traditional Chinese Medicine Work in the Field of Maternal and Child Health (2021-2025)” (hereinafter referred to as the “Implementation Plan”) [3], which provides comprehensive deployment for advancing TCM work in maternal and child health to support high-quality population development. TCM services have already been deeply integrated into China’s maternal health management service system and have achieved numerous positive advances.

TCM is widely applied among pregnant and postpartum women worldwide [4]. Research indicates that the utilization rate of TCM among pregnant and postpartum populations ranges from 7% to 96%, with herbal medicine being the preferred treatment for some pregnant women when ill [5]. A large-scale cohort study published in 2023 involving nearly 200,000 pregnant and postpartum

women found that from 2014 to 2018, 26.13% of pregnant women and 55.63% of postpartum women in Xiamen used Chinese herbal medicine, with usage increasing significantly over time [6]. However, the complex composition of herbal medicines and unclear mechanisms of action make safety during pregnancy and lactation a critical research concern [7]. Pregnant and postpartum women often lack adequate knowledge of perinatal TCM health care, have limited safety awareness, and primarily rely on non-medical professionals for information [8-10], posing multiple risks and challenges to the safe use of TCM during the perinatal period. Therefore, strengthening research on TCM utilization behaviors among pregnant and postpartum women is essential for improving their health knowledge, developing targeted interventions, and advancing TCM work in maternal and child health.

The Theory of Planned Behavior (TPB) is a well-established framework widely applied to predict and explain health behaviors [11-12]. The theory posits that behavioral intention (the likelihood of performing a behavior) predicts actual behavior, while intention is influenced by subjective norms (perceived social pressure to perform or not perform the behavior), attitudes, and perceived behavioral control (perceived ease or difficulty of performing the behavior). TPB has been extensively used to study health-related behaviors during pregnancy and lactation, including smoking, alcohol consumption, nutrition, and breastfeeding [13]. For example, BEN NATAN et al. [14] conducted a questionnaire survey of 201 pregnant smokers aged 19-46 in Israel based on TPB and found that the theory effectively predicted pregnant women's smoking intentions, offering recommendations for developing smoking cessation interventions. More recently, researchers have applied TPB to study TCM use intentions and behaviors [15]. ROCHELLE et al. [16] analyzed TCM use behaviors among 272 Chinese individuals in the UK and found that being female, older age, strong attachment to Chinese culture, opinions of significant others, and recent TCM use experiences all influenced their TCM utilization behaviors. Based on this literature, we propose that TPB may also have the potential to identify factors influencing TCM use intentions among pregnant and postpartum women. Therefore, this study employs TPB as a framework to comprehensively investigate TCM utilization patterns among pregnant and postpartum women across different regions of China and explore the influencing factors of their TCM use intentions, hoping to provide references for more targeted implementation of TCM services for this population and advancing TCM work in maternal and child health.

1. Methods

1.1 Study Participants

From June to October 2023, we conducted a cross-sectional study using convenience sampling among pregnant and lactating women receiving maternal and child health care services at multiple maternal and child health institutions across China. When pregnant and postpartum women visited these institutions,

trained members of the Maternal and Child Health Management Professional Committee of the China Medicine Education Association, distributed across various maternal and child health institutions nationwide, guided voluntary participants to complete anonymous questionnaires through the Wenjuanxing platform. To prevent multiple submissions, each device was allowed to complete the questionnaire only once. Inclusion criteria were: (1) literate and able to understand the questionnaire; (2) voluntary participation with signed informed consent; (3) aged 15-49 years; (4) pregnant or lactating at the time of the survey; (5) able to access the internet via mobile phone or computer. This study was approved by the Ethics Committee of Peking Union Medical College Hospital (Approval No.: I-24PJ1428), and all participants provided informed consent. Sample size was calculated as 10 times the number of measurement items [15]. A total of 264 questionnaires were distributed, with 264 valid questionnaires returned, yielding a 100% valid response rate.

1.2 Research Methods

Past behavioral experiences often serve as good predictors of future behavior [17]. Previous behavioral experiences have also been proven to be important predictors of intentions for smoking cessation, exclusive breastfeeding, nutritional supplement use, and TCM use during pregnancy and lactation [18-21]. Therefore, based on relevant literature, this study extended the Theory of Planned Behavior by adding “past TCM use experience” as a latent variable to construct a theoretical model of influencing factors for TCM use intention among pregnant and postpartum women (Figure 1 [Figure 1: see original paper]).

1.3 Statistical Analysis

We used SPSS 22.0 software for descriptive statistics (demographics, clinical characteristics, and TPB constructs) and reliability analysis (Cronbach's α coefficient ≥ 0.6 was considered acceptable, ≥ 0.8 good). Multivariate Logistic regression analysis was employed to explore influencing factors of TCM use among pregnant and postpartum women. AMOS 26.0 was used for structural equation modeling analysis. We validated scale structural validity through principal component analysis (eigenvalue >1 , factor loading >0.5), then confirmed measurement model fit through confirmatory factor analysis ($\chi^2/df=1-5$, GFI/CFI >0.90 , RMSEA <0.05) [22], and tested convergent validity by calculating composite reliability (CR >0.7) and average variance extracted (AVE >0.5). Finally, structural equation modeling was used to analyze the effects of independent variables including attitude, subjective norms, perceived behavioral control, and past TCM use experience on TCM use intention among pregnant and postpartum women. $P<0.05$ was considered statistically significant.

2. Results

2.1 General Characteristics of Participants

The demographic characteristics of the 264 participating pregnant and postpartum women are shown in Table 1. Participants had a mean age of 31.0 years, with 70.8% (187/264) aged 25-34, 69.0% (182/264) employed, 76.9% (203/264) with university-level education or higher, 60.9% (161/264) reporting good self-rated health status, and 76.9% (203/264) reporting no adverse pregnancy history. The distribution across pregnancy/lactation stages and monthly household income was relatively balanced. Women from four regions—Fujian, Beijing, Guangdong, and Sichuan—accounted for 84.9% (224/264) of the sample.

2.2 Current Status of TCM Use Among Pregnant and Postpartum Women

Overall, 56.1% (148) of respondents had used TCM outside of pregnancy, while 37.5% (99) had used TCM during the current pregnancy or postpartum period. The numbers and rates of TCM use during early pregnancy (0-12 weeks), second trimester (13-27 weeks), third trimester (28 weeks), and lactation were 10 (15.6%), 20 (31.7%), 22 (30.6%), and 45 (75.0%), respectively.

Using TCM use during pregnancy/lactation as the dependent variable (assignment: used=1, not used=2) and including pregnancy/lactation stage (assignment: early pregnancy=1, second trimester=2, third trimester=3, lactation=4, other=5), past TCM use history (assignment: yes=1, no=2), age group (assignment: <20 years=1, 20-24 years=2, 25-29 years=3, 30-34 years=4, 35-39 years=5, 40-44 years=6, ≥45 years=7), education level (assignment: junior high=2, high school=3, college/bachelor=4, master's or above=5), employment status (assignment: employed=1, unemployed=2), monthly household income (assignment: \$5,000 yuan=1, 5,001-10,000 yuan=2, 10,001-20,000 yuan=3, 20,001-50,000 yuan=4, >50,000 yuan=5), self-rated health status (assignment: poor=1, fair=2, good=3, very good=4), and adverse pregnancy history (assignment: yes=1, no=2) as independent variables, multivariate Logistic regression analysis showed that pregnancy/lactation stage and past TCM use history were influencing factors for TCM use among pregnant and postpartum women ($P<0.05$), as shown in Table 2.

2.3 TCM Use Intention and Influencing Factors Among Pregnant and Postpartum Women

Descriptive statistical analysis of TPB constructs and the past TCM use experience covariate revealed that participants had relatively positive attitudes toward TCM use (5.49 ± 1.13), *strong intention to use TCM* (4.95 ± 1.04), *high perceived behavioral control over TCM use*. Additionally, exploratory factor analysis showed a KMO test statistic of 0.960 and a Bartlett's sphericity test value of 5,539.327 ($P<0.001$), indicating suitability for factor analysis. The cumulative variance contribution rate of the questionnaire was 84.527%, with all item factor loadings >0.700 .

Structural equation modeling was used to analyze path relationships among variables in the theoretical model. Confirmatory factor analysis results showed that all fit indices fell within acceptable ranges ($\chi^2/DF=1.53$, $GFI=0.96$, $CFI=0.99$, $RMSEA=0.04$), indicating that TPB is a valid predictive model for TCM use intention during pregnancy/lactation. The effects of the four TPB variables (subjective norms, behavioral intention, perceived behavioral control, attitude) and the past TCM use experience covariate on TCM use intention during pregnancy/lactation are shown in Figure 2 [Figure 2: see original paper] and Table 3. The results demonstrated that subjective norms ($\beta=0.435$), perceived behavioral control ($\beta=0.294$), attitude ($\beta=0.304$), and past TCM use experience ($\beta=0.240$) all had positive effects on TCM use intention during pregnancy/lactation ($P<0.001$). Subjective norms ($\beta=0.459$), perceived behavioral control ($\beta=0.591$), and past TCM use experience ($\beta=0.306$) also positively influenced attitudes toward TCM use ($P<0.001$).

3. Discussion

3.1 TCM Service Utilization Among Pregnant and Postpartum Women Needs Improvement

Among the 264 pregnant and postpartum women in this study, the self-reported average TCM utilization rate was 37.5%, which still falls short of the requirements proposed in the “Implementation Plan” that by 2025, 90% of tertiary and 70% of secondary maternal and child health hospitals should provide TCM specialty services. TCM service utilization among pregnant and postpartum women needs improvement. According to TPB, behavioral intention is a key predictor of behavior. This study found that the pregnant and postpartum population had relatively high TCM use intention (4.95 ± 1.04). Measures such as strengthening perinatal TCM health education and training promotion to foster positive attitudes toward TCM services, encouraging support and recommendations for TCM use from family members and healthcare providers to create a positive social support environment, optimizing perinatal TCM service processes and accessibility to enhance perceived behavioral control, and developing personalized TCM use plans based on individual circumstances could effectively help translate TCM use intention into actual behavior, thereby further increasing the likelihood of TCM service utilization.

3.2 Regional Variations in TCM Service Utilization Require Tailored Strategies

TCM utilization rates varied among participants from different regions. Beijing had the highest rate (59.3%, 35/59), followed by Guangdong (55.8%, 24/43) and Sichuan (30.8%, 12/39), while Fujian had only 9.6% (8/83). These findings corroborate other studies showing regional differences and diversity in TCM use among pregnant and postpartum women [23-24]. Beyond regional socioeconomic levels, cultural differences in TCM, and methodological variations, differences in local policies tailored to maternal and child health TCM work based on national

policies also contribute to these variations. For example, Beijing formulated the “Ascending-Descending-Floating-Sinking” project implementation plan for TCM in maternal and child health, focusing on TCM gynecology and pediatrics [25]. Fujian’s TCM health promotion special activities proposed establishing prenatal and postnatal clinics in TCM hospitals and developing TCM specialty services in maternal and child health hospitals [26]. Guangdong province launched demonstration base construction for TCM work in maternal and child health institutions across the province, aiming to cultivate 15 model institutions within three years [27]. These local policies focus on addressing specific needs and challenges in regional maternal and child health TCM services, with policy differences directly affecting work priorities and implementation intensity for TCM services targeting pregnant and postpartum women. While consolidating TCM work focusing on gynecology and pediatrics, regions should also tailor reforms of TCM service models for obstetrics and pregnant/postpartum populations to further improve service delivery.

3.3 Leveraging Family and Friend Influences and Maximizing Healthcare Provider Roles to Promote TCM Services

This study found that subjective norms—opinions of important others such as family and friends—were the strongest factor influencing TCM use intention among pregnant and postpartum women ($\beta=0.435$, $P<0.001$). Similar conclusions have been drawn in studies on health behaviors during pregnancy and lactation, including diet, exercise, and self-medication [28-29]. For instance, KARIMIAN et al. [28] found that pregnant women who perceived approval from family and friends for herbal self-medication during pregnancy were more likely to use herbs ($P<0.05$). Compared to women influenced by Western culture, those under non-Western cultural influences tend to rely more on family and friends when considering complementary and alternative medicine [30-32]. LEE et al. [29] noted that subjective norms are deeply rooted in Asian culture and may predict behavioral intention better than attitudes. ZHENG et al. [9] found that family and friends’ recommendations were primary information sources for traditional/complementary medicine use among 500 lactating women in Macau, with 55.6% reporting insufficient information to make appropriate decisions and healthcare professionals playing a minimal role in providing such information.

Pregnancy and lactation represent a special and sensitive period in women’s lives, during which they are more susceptible to influence from family and friends, whose opinions may even take precedence over their own attitudes. Medication use during pregnancy involves numerous risks, yet risks associated with TCM use during pregnancy remain largely unknown [7]. Influenced by traditional beliefs, TCM is often considered natural and harmless, making unsupervised intentional or unintentional use during pregnancy and lactation a potential health and safety hazard. Family and friends may lack adequate TCM knowledge to provide safe recommendations. Given the increasingly common demand for perinatal TCM services, greater attention should be paid to subjective norms

regarding TCM use in perinatal health care. Strategies could include improving TCM health literacy across the general population to enhance family and friends' awareness and trust in TCM, thereby effectively utilizing their influence to promote acceptance of TCM services and improve service capacity in maternal and child health. Additionally, efforts should strengthen education to improve pregnant and postpartum women' s own TCM knowledge and literacy, further driving the popularization and application of TCM services. Furthermore, addressing the insufficient role of medical professionals in providing perinatal TCM health information requires recognizing and mobilizing healthcare providers as the main force in perinatal TCM services, strengthening their knowledge and skills training to ensure they possess appropriate competencies for providing safe and appropriate TCM services.

3.4 Understanding Past TCM Use Experiences and Developing Life-Course TCM Service Systems

This study found that past TCM use experience was a significant influencing factor for TCM use intention and behavior among Chinese pregnant and lactating women, consistent with existing research [21,33]. Previous experiences with TCM, complementary and alternative medicine, and traditional medicines worldwide significantly influence women' s reuse during pregnancy or lactation. For example, WEN et al. [23] found that prior herbal medicine use increased the likelihood of use during pregnancy (OR=5.69, 95%CI=5.46-5.93) among 16,553 pregnant women in Taiwan. Additionally, this study found a positive correlation between past TCM use experience and attitudes toward TCM ($\beta=0.306$, $P<0.001$). Positive past experiences may help women develop favorable attitudes toward TCM during pregnancy and lactation and enhance their use intention.

Advancing TCM work in maternal and child health is a gradual process. In recent years, under the guidance of the Healthy China strategy, TCM health services have developed toward comprehensive, life-course coverage [34]. Developing a life-course TCM service system and integrating TCM health concepts and practices into daily life are crucial for driving TCM service development for pregnant and postpartum women. Furthermore, healthcare providers should strengthen their understanding of patients' past TCM use during service delivery, enhance safety management of TCM use among pregnant and postpartum women, and better standardize and guide TCM use behaviors and health management services.

Conclusion

Through a questionnaire survey of pregnant and lactating women at maternal and child health institutions across northern, southern, eastern, and southwestern China, this study found that the Theory of Planned Behavior can be used to predict influencing factors of TCM use intention during pregnancy and lactation.

Subjective norms, attitudes, perceived behavioral control, and past TCM use experience all significantly influence TCM use intention among Chinese pregnant and postpartum women. Facing the increasingly common demand for perinatal TCM services and addressing issues including low utilization rates, regional disparities, susceptibility to important others' opinions, and influence of past experiences, this study proposes recommendations for translating TCM use intention into actual behavior. These include implementing tailored strategies to advance TCM service model reforms for pregnant and postpartum populations, strengthening attention to subjective norms in perinatal health care, effectively leveraging family and friend influences while maximizing healthcare providers' roles, and accelerating the development of life-course TCM service systems to promote TCM service application and advance TCM work in maternal and child health.

Limitations

First, data on TCM use among pregnant and postpartum women were obtained through self-reported questionnaires, which may involve measurement bias. Second, this cross-sectional study used convenience sampling across multiple provinces, which may not be representative of all pregnant and postpartum women in China. Future research should expand the scope and sample size and employ qualitative methods to reveal TCM use behaviors and service utilization from different perspectives.

Author Contributions

LI Zanmei conceptualized the study, designed the research protocol, and was responsible for manuscript writing and revision. LI Jiao managed research implementation. YANG Lin participated in research protocol discussion and manuscript revision. YAO Weiwei was responsible for data collection, organization, and statistical analysis. MA Liangkun and XUAN Lei conducted feasibility analysis and article quality control and review.

The authors have no conflicts of interest to declare.

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