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ORIGINAL RESEARCH

Application Intention and Influencing Factors of Traditional Chinese Medicine in Patients with Mixed Hemorrhoids: A Cross-Sectional Study in China

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Background: With the development of traditional Chinese medicine (TCM), TCM has demonstrated unique advantages and satisfactory efficacy in the management of mixed hemorrhoid in the perioperative period. However, under the impact of modern medicine, there is still a long way to go before the clinical application of TCM can be recognised by the public.

Purpose: The purpose of this study was to understand the application intention of TCM in patients with mixed hemorrhoid in the Department of Integrated TCM and Western Medicine and explore its influencing factors.

Methods: Patients with mixed hemorrhoid treated in our hospital from January 2019 to January 2023 were selected using convenience sampling method. The survey was conducted using the general information questionnaire and the application intention scale of TCM.

Results: The mean application intention score of TCM in patients with mixed hemorrhoid was 22.6±8.6. Multiple linear regression analysis showed that genders, education, psychological condition, previous participation in TCM-type lectures, previous use of TCM and course of disease were independent factors influencing application intention of TCM.

Conclusion: Patients with mixed hemorrhoid showed a moderate level of application intention of TCM. By improving the psychological condition of the patients, the application intention of TCM may be positively affected in this group. However, the lack of longitudinal data and external validation of the scale need to be further improved.

Plain Language Summary: The qualitative study demonstrated the application intention of TCM in the patients with mixed hemorrhoid and further explored its influencing factors. Patients with mixed hemorrhoid showed a moderate level of intention to apply TCM. Improvement in psychological condition had a positive effect on the application intention of TCM. Conducting lectures on TCM may reduce patients' application intention of TCM.

Keywords: application intention, influencing factors, traditional Chinese medicine, mixed hemorrhoid

Introduction

Hemorrhoids are venous plexuses formed by congestion, dilatation and curvature of the venous plexus in the lower rectum.[1] Clinical manifestations include hematochezia, anal swelling, foreign-body sensation or pain, local discharge or itching, hemorrhoid pad prolapse or protrusion of the mass.[2,3] The incidence of hemorrhoids is increasing every year due to unhealthy lifestyle habits as well as environmental and genetic factors. The prevalence of hemorrhoids in the general population is 4.4% worldwide.[4] Hemorrhoid disease is the fourth most common outpatient gastrointestinal disorder in the United States, accounting for 3.3 million outpatient visits.[5] Although this disease is not fatal, symptomatic hemorrhoids have an impact on patients' quality of life.[6]

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Mixed hemorrhoids are one of the most common types of hemorrhoids and consist of fusion of the internal and external hemorrhoid vascular plexuses at the corresponding sites with each other.[7] Mixed hemorrhoids are prone to recurrent bleeding which may lead to severe anaemia. As such, they may negatively affect the health of the patients and require surgical treatment. The core treatment of hemorrhoids includes conservative and surgical treatment. According to the Goligher clinical grading system, hemorrhoids are classified as grades I–IV.[8] Mildly symptomatic hemorrhoids (grades I and II) can usually be managed with conservative treatment,[9] whereas symptomatic grade III to IV hemorrhoids usually require surgical treatment.[10]

With technological innovations, more and more new surgical techniques are applied to the treatment of mixed hemorrhoid.[11–13] Nevertheless, most patients experience varying degrees of postoperative pain, which may even lead to anxiety.[14] Therefore, surgical techniques alone cannot meet patients' needs for a good perioperative experience. With the development of Traditional Chinese Medicine (TCM), more and more units have tried to incorporate TCM into the perioperative treatment of mixed haemorrhoid and achieved satisfactory results.[15–17] Despite the significant advantages of TCM in relieving pain and improving the quality of life of patients with mixed haemorrhoid, however, its mechanism needs to be further clarified.[18] Moreover, due to the social and cultural barriers between Chinese and Western societies, there is still a long way to go for TCM to be integrated into the modern healthcare system and recognized globally. In clinical practice, we found that some patients still hold a positive attitude towards the means of TCM and hope to obtain therapeutic effects through TCM. Therefore, understanding the willingness of patients with mixed hemorrhoid to apply TCM will help medical staff to better understand patients' needs, formulate personalised treatment plans, and promote better integration of TCM into Western medicine. Currently, there are fewer studies on the the application intention of TCM in patients with mixed hemorrhoid. Therefore, this study aims to investigate the current situation and possible risk factors of the application intention of TCM in patients with mixed hemorrhoid, in order to provide a scientific basis for guiding medical staff to develop better treatment measures, as well as the application of TCM in the treatment of anorectal diseases.

Materials and Methods

Subjects

Patients with mixed hemorrhoid in our department from January 2019 to January 2023 were selected as the study population to be investigated. In order to be eligible for the study, participants were required to meet the following criteria: (1) mixed hemorrhoid, which seriously affect daily life; (2) aged 18 years or older; (3) voluntarily participating in this trial. Exclusion criteria included: (1) suffering from severe mental disorders (CD-10/DSM-5 standards); (2) pregnant women, lactating women, menstruating women; (3) suffering from inflammatory diseases of the anus and intestines, perianal abscesses, tumours, ulcerative colitis, Crohn's disease, perianal skin disease, or related diseases; and (4) incomplete information. The sample size was determined through power analysis. Based on the median effect size (f^2= 0.15), α=0.05, and power=0.8, 66 cases of linear regression were required. Currently, 150 cases were included, and smaller effects could be detected ($f^2 \geq 0.05$).

Questionnaires

General Information Questionnaire

The general information questionnaire was self-designed and included gender, age, education level, marital status, psychological condition, course of disease previous participation in TCM-type lectures, previous knowledge of TCM, previous use of TCM, and attitude towards TCM.

Application Intention Scale of TCM

The scale was designed by the researcher based on an extensive review of the literature,[19,20] and seven nursing experts from our hospital were invited to review and modify it (Supplementary Table 1). The scale consisted of five sections, namely, performance expectations, effort expectations, perceptual benefit, social impact and application intention. The content validity index of the scale was 0.863. Twenty patients with mixed hemorrhoid who met the requirements were selected for the preliminary experiment, and the Cronbach's α coefficient was 0.826, which indicated that the scale had

good reliability and validity. There were 22 items, each of which was graded at 3 levels: "Not in favour (Not)" = 0, "Unsure (Not sure)" = 1, and "In favour (Yes)" = 2. The score ranged from 0 to 44 points. The higher the score, the higher the application intention. The Cronbach's α coefficient for this study was 0.845. Exploratory factor analysis (EFA) showed that KMO=0.82, and the three-factor structure was extracted (cumulative explained variance 61%).

Investigation Procedure

Before the beginning of the survey, the patients were informed of the precautions to be taken in the process of filling out the questionnaires. Experimental bias were strictly controlled during the survey to avoid contamination of patients. The questionnaires were completed independently by the patients according to the actual situation. After the completion of the survey, all the questionnaires were collected in time, and the contents of the questionnaires were carefully checked for any omissions or errors to ensure the validity of the questionnaires. After confirming that all questionnaires were correct, two independent research assistants inputed the survey data into the SPSS system (https://www.ibm.com/spss?lnk=flatitem) for statistical analysis.

Statistical Analysis

Statistical analysis was performed using SPSS 27.0 software (SPSS Chicago, IL, USA). Categorical variables were presented by frequencies and percentages, while continuous variables were presented by mean and standard deviation. The influence factors were analyzed by Mann–Whitney U analysis, Pearson correlation analysis, and linear regression analysis with a test level of $\alpha = 0.05$.

Results

Baseline Characteristics of Patients with Mixed Hemorrhoid and Application Intention of TCM

A total of 150 patients with mixed hemorrhoid participated in this study. The age ranged from 22 to 69 years. Among them, 64 (42.7%) were male and 86 (57.3%) were female. The mean application intention score of TCM in patients with mixed hemorrhoid was 22.6±8.6 points (total scale score: 44 points) (Table 1).

Influencing Factors of Application Intention of TCM

The results of Mann–Whitney U analysis showed statistically significant differences between groups in application intention of TCM in patients with mixed hemorrhoid in terms of gender, education, psychological condition, previous participation in TCM-type lectures, previous use of TCM, and attitude towards TCM ($p < 0.05$) (Table 2).

Table 1 Demographic Characters of Participants

Item	
Age, years	53.5±10.6
Gender, n	
Male	64
Female	86
BMI, kg/m^2	21.1±2.4
Education	
Below Bachelor Degree	29
Bachelor degree or above	121
Marital status	
Unmarried	10
Married	140
Course of disease, years	3.3±3.0
Application intention score of TCM, points	22.6±8.6
Total	150

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Table 2 Influencing Factors of Application Intention of TCM (Non-Parametric Tests)

Variables	Group	N	Median (IQR)	*p*	Effect Size (*r*)
Gender	Male	64	17.5 (12.0–23.0)	<0.001	0.42
	Female	86	26.0 (20.0–31.0)		
Education	Below Bachelor Degree	29	14.0 (10.0–18.0)	<0.001	0.38
	Bachelor degree or above	121	25.0 (19.0–30.0)		
Marital status	Unmarried	10	25.0 (18.5–31.5)	0.362	0.07
	Married	140	22.0 (17.0–28.0)		
Psychological condition	Negative	30	13.5 (10.0–18.0)	<0.001	0.45
	Positive	120	25.0 (20.0–30.0)		
Previous participation in TCM-type lectures	Yes	110	26.0 (20.0–31.0)	<0.001	0.52
	No	40	15.0 (11.0–19.0)		
Previous use of TCM	Yes	108	25.0 (20.0–30.0)	<0.001	0.35
	No	42	15.0 (11.0–20.0)		
Attitude towards TCM	Endorsement	114	25.0 (20.0–30.0)	<0.001	0.40
	Denial	36	14.0 (10.0–18.0)		

Note: All comparisons were performed using Mann–Whitney *U*-tests due to non-normality of data (Shapiro–Wilk *p*<0.05). Effect size *r*≥0.3 indicates clinically meaningful differences.
Abbreviation: IQR, Inter Quartile Range.

Correlation Analysis of Application Intention of TCM

Further correlation analyses were conducted between age, course of disease and application intention of TCM in patients with mixed hemorrhoid. The results showed that age did not correlate with application intention of TCM ($r = 0.036$, $p = 0.662$), and the course of disease was significantly positively correlated with application intention of TCM ($r = 0.370$, $p < 0.001$) (Table 3).

Multiple Linear Regression Analysis of Application Intention of TCM

Multiple linear regression analyses were performed with application intention score of TCM in patients with mixed hemorrhoid as the dependent variable, and gender, education, psychological condition, previous participation in TCM-type lectures, previous use of TCM, and attitude towards TCM and course of disease as the independent variables. The results showed that there were statistically significant differences in application intention score of TCM between different genders, education, psychological condition, previous participation in TCM-type lectures, previous use of TCM and course of disease ($p < 0.05$) (Table 4).

Discussion

Current Situation of Application Intention of TCM in Patients with Mixed Hemorrhoid

In medical research, investigating patients' application intention of TCM has an important guiding and reference value, which can provide a basis for medical institutions, doctors and patients to promote the application and development of TCM. With the increasing attention and publicity of the state to TCM, more and more patients' knowledge of and demand for TCM has been further enhanced. Hong et al used the technology acceptance model to analyze the influence of patients' subjective perception of usefulness and ease of use and the four social factors of external medical staff, family members, friends and patients on their application intention of TCM.[21] Song et al analyzed the effects of demographic factors, attitudes and understanding of TCM on TCM acceptance.[22] These two studies mainly focused

Table 3 Correlation Analysis of Application Intention of TCM

	Age, Years	Course of Disease, Years
Application intention score of TCM r(*p*)[a]	0.036 (= 0.662)	0.370 (< 0.001)

Note: [a]r Pearson Correlation Coefficient, *p* *p*-value (Correlation is significant at the 0.05 level).

Table 4 Multiple Linear Regression Analysis of Application Intention of TCM

	B	SE	β	t	*p*	VIF
Constant	8.826	5.068		1.741	0.084	–
Gender	5.648	0.981	0.327	5.759	<0.001	1.12
Education	3.995	1.283	0.184	3.114	0.002	1.08
Psychological condition	3.037	1.298	0.142	2.341	0.021	1.05
Previous participation in TCM-type lectures	−4.377	1.206	−0.226	−3.628	<0.001	1.22
Previous use of TCM	−2.768	1.163	−0.145	−2.380	0.019	1.18
Attitude towards TCM	−2.403	1.284	−0.120	−1.872	0.063	1.15
Course of disease	3.172	1.050	0.177	3.021	0.003	1.10

Note: $R^2 = 0.619$, adjusted $R^2 = 0.600$, F=32.902, $p < 0.001$. All VIF<5, and there is no multicollinearity problem. In the qualitative variables, course of disease≤2 years was assigned as "1"; course of disease>2 years was assigned as "2".
Abbreviations: B, Non-standardized coefficient; SE, Standard error; β, Standardization coefficient; R, Coefficient of determination; VIF, Variance Inflation Factor.

on community populations and were relatively limited in their analyses of influencing factors. The social-ecologic model considers the incorporation of multilevel external sociological factors, including community neighbourhood, social groups, work environment, and media policies, in addition to considering individual internal factors.[23] This scale considers the influence of external factors on the application intention of TCM in patients with mixed hemorrhoid from the perspective of the socio-ecologic model, making the scale assessment content multidimensional and comprehensive. Understanding the influencing factors of application intention of TCM in patients with mixed hemorrhoid provides a basis for patients' medical care decisions and clinical practice.

The results of this study showed that the mean score for application intention of TCM in patients with mixed hemorrhoid was (22.6± 8.6), indicating that the application intention of TCM was of medium level. This result was similar to the level of acceptance of TCM among elderly residents in the community.[21,22] Nonetheless, patients' knowledge of TCM needed to be improved and a certain degree of acceptance existed. Firstly, as a traditional medical system, TCM has certain differences and uniqueness from Western medicine, and patients may have relatively little knowledge of TCM.[24] For example, modern medicine emphasizes evidence-based medicine, some of the therapies of TCM lack of large-scale clinical data support. The younger generation is more inclined to receive Western science education and has limited understanding of the abstract theories of TCM, even regarding them as "metaphysics". This may be related to the popularity and dominance of Western medicine in the modern medical environment.[25] Hospitals are dominated by Western medicine, Chinese medicine departments are marginalized, some of the "combination of Chinese and Western medicine" is reduced to a formality, and patients are more inclined to choose Western therapies with quick results. Therefore, there is a need to enhance the popularisation of patients' knowledge of TCM and to improve their understanding of TCM, so that they can have a more comprehensive understanding of the characteristics, efficacy and scope of application of TCM. Secondly, despite their relatively limited knowledge of TCM, patients showed a moderate level of application intention of TCM, which implied that they held a certain positive attitude towards the application of TCM. This may be due to their recognition of TCM or consideration of the limitations or discomfort of Western medicine treatment. This result suggested that it is feasible to introduce TCM interventions in the treatment of anorectal diseases and that patients hold a high acceptance intention, which is conducive to the integrated treatment of TCM and Western medicine.

Correlation Analysis of Application Intention of TCM

The application intention of TCM in patients with mixed hemorrhoid was significantly and positively correlated with the course of disease ($r = 0.370$, $p < 0.001$), suggesting that the longer the course of disease, the stronger the application intention of TCM. Unsurprisingly, long course of disease indicated to some extent that previous treatments were ineffective or ineffective, and patients lost confidence in previous treatments and dared to try TCM. Another possibility was that some of the patients had received previous treatment with TCM techniques and obtained better treatment results, especially in terms of postoperative hemorrhoidal complications, such as pain and anal edge edema.[15–17,26] Therefore, once the onset of the disease, the application intention of TCM in such patients remained strong. Therefore, individualised TCM treatment plans are developed according to the specific conditions of the patients in order to increase the therapeutic effect and patients' satisfaction.

Other Influencing Factors of Application Intention of TCM

Previous participation in TCM-type lectures had an effect on application intention of TCM ($t = -3.628$, $p < 0.001$). This may be related to the following factors. Firstly, patients who had attended lectures on TCM had a deeper understanding of TCM, however, the poor effect of the application of TCM in reality contrasted greatly with this in-depth understanding, resulting in patients' great resistance to TCM. Secondly, the effect of TCM on the treatment of diseases has a slow onset of action, which contradicted with the patients' willingness to recover from the disease quickly. Finally, the mechanism of TCM was still unclear, which made many patients hold a wait-and-see attitude towards the application of TCM. Therefore, for those who have attended lectures on TCM, this group should be properly guided to recognize the knowledge related to TCM, such as the components and mechanism of action of TCM. Patients should be introduced to the application and efficacy of TCM in the treatment of anorectal diseases through publicity campaigns, health talks or symposiums.

Previous use of TCM had an impact on the application intention of TCM ($t = -2.380$, $p = 0.019$). This indicated that patients who had received TCM treatment hold a negative attitude towards the application of TCM. This might be related to the poor experience of previous TCM applications. Patients with mixed hemorrhoid should be encouraged to have an in-depth understanding of the mechanism of action and indications of TCM on the premise of ensuring safety, so as to ensure the correct application of TCM and the guarantee of therapeutic effect.

In addition, female patients scored higher than males in their application intention of TCM. Previous studies have found that women's desire for health knowledge is higher than men's,[27] and women pay more attention to health care and chronic disease management.[28] TCM technology in health care and chronic disease management has a unique concept that fits the needs of patients, so women's application intention of TCM is higher. This suggests that healthcare professionals should use the principle of treating the disease before it develops according to the patients' disease development pattern, develop TCM technology care programmes and individual healthcare programmes suitable for the patients themselves. At the same time, more emphasis is placed on the male patient population to enhance the recognition and acceptance of TCM.

The higher the level of education, the higher the application intention of TCM. This may be related to the fact that such patients pay more attention to their health status and have better understanding and judgement.[29] This suggests that under interventions to increase patients' application intention of TCM, more attention should be paid to patients with low literacy level and intervention strategies and measures should be developed for their comprehension.[29] Lectures on TCM and free experience activities can be carried out jointly with the community to explain the use and efficacy of TCM in layman's language to improve the understanding and recognition of TCM by patients with low literacy level.

Finally, the patients with positive attitude had higher application intention of TCM ($t = 2.341$, $p = 0.021$). This may be related to the fact that those with positive attitude have an open attitude towards TCM treatment. Therefore, for negative patients, doctors and healthcare professionals should communicate and interact fully with patients, answer their questions and concerns about TCM, and provide professional guidance and advice. At the same time, reliable evidence support should be provided to patients through scientific and systematic clinical studies to increase their confidence and acceptance of TCM.

Therefore, in view of the above influencing factors, we work in the following aspects. (1) For those with high-intention groups, efforts should be made to strengthen their advantageous areas. Our study showed that female, highly educated people, and patients with chronic diseases (eg, course of disease > 2 years) had a high application intention of TCM, so we can focus on covering these groups in the process of community publicity, highlighting the advantages of TCM in gynecological diseases, subhealth management, and chronic disease management. (2) To address the key obstacles, it is necessary to optimize the service model. "Participation in TCM lectures reduced the application intention of TCM" ($\beta = -0.226$ in Table 4), which may be due to the obscure or utilitarian content of the lectures. It is necessary to improve them into interactive experiences (such as free physical constitution testing and personalized plans). Through the analysis of influencing factors, the abstract patients' needs are transformed into a landable service chain, which ultimately improves the utilization rate of TCM services and reshapes the status of TCM as an important part of modern integrative medicine. However, there were several limitations of this study that should be mentioned. Firstly, the data were collected from a single centre. Secondly, this study did not investigate other baseline characteristics that may

influence the application intention of TCM in patients with mixed hemorrhoid. Thirdly, the application intention scale of TCM was self-designed and may not be applicable to other countries or healthcare units. Therefore, further studies could expand the coverage and diversity of the samples to verify the validity and reliability of the scale.

Conclusion

The application intention of TCM in patients with mixed hemorrhoid was at a moderate level. Improving patients' psychological condition may have a positive impact on their application intention of TCM. Previous participation in TCM-type lectures and application of TCM may reduce patients' application intention of TCM. Guidance and education on the application of TCM should be strengthened for patients with lower literacy level, patients with a short course of disease. Future research will need to conduct longitudinal or intervention-based validations.

Abbreviations

TCM, Traditional Chinese medicine; EFA, Exploratory factor analysis; IQR, Inter Quartile Range; VIF, Variance Inflation Factor.

Data Sharing Statement

The datasets generated during the current study are available from the corresponding author on reasonable request.

Ethics Approval and Consent to Participate

The study complied with the Declaration of Helsinki and was approved by the ethics committee of West China Hospital of Sichuan University. All patients provided written informed consent. The informed consent procedure for the illiterate participants was conducted by their legal guardians on their behalf.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors declare that they have no competing interests.

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