

May 25, 2026

🌐 Plum-Blossom Needle Tapping combined with Ginger Juice Rubbing as an effective therapy for preventing hair loss in female obese patients after metabolic bariatric surgery: A 6-month 2×2 factorial design research protocol

DOI

<https://dx.doi.org/10.17504/protocols.io.bp2l6joezvqe/v1>

Yingshuyi Zhou¹, Yuan Yuan¹, Jia Wu², Ziqi Jiang¹, Bin Zhou¹, Hongliu Xu¹, Weiwei Li¹, Jiayi Gu¹, Ping Chen¹, Qi Zheng¹, Lilian Gao³

¹Ningbo No.2 Hospital, Wenzhou Medical University; ²Huzhou College;

³The First Affiliated Hospital of Jinan University

hair loss in female obes...



Yingshuyi Zhou

Ningbo No.2 Hospital

Create & collaborate more with a free account

Edit and publish protocols, collaborate in communities, share insights through comments, and track progress with run records.

Create free account

OPEN  ACCESS



DOI: <https://dx.doi.org/10.17504/protocols.io.bp2l6joezvqe/v1>

Protocol Citation: Yingshuyi Zhou, Yuan Yuan, Jia Wu, Ziqi Jiang, Bin Zhou, Hongliu Xu, Weiwei Li, Jiayi Gu, Ping Chen, Qi Zheng, Lilian Gao 2026. Plum-Blossom Needle Tapping combined with Ginger Juice Rubbing as an effective therapy for preventing hair loss in female obese patients after metabolic bariatric surgery: A 6-month 2x2 factorial design research protocol. [protocols.io https://dx.doi.org/10.17504/protocols.io.bp2l6joezvqe/v1](https://dx.doi.org/10.17504/protocols.io.bp2l6joezvqe/v1)

License: This is an open access protocol distributed under the terms of the [Creative Commons Attribution License](https://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited

Protocol status: Working

We use this protocol and it's working

Created: May 23, 2026

Last Modified: May 25, 2026

Protocol Integer ID: 317800

Keywords: Complementary Therapies, Plum-Blossom Needle Tapping, Ginger Juice Rubbing, Metabolic Bariatric Surgery, Hair Loss, Chinese Medical technology, ginger juice rubbing as an effective therapy, hair loss after metabolic bariatric surgery, hair loss in obese patient, prevention of postoperative hair loss, hair loss in female obese patient, ginger juice, preventing hair loss, ginger juice rubbing group, postoperative hair loss, ginger juice rubbing, hair loss in female patient, weight loss effect, preventive effect of plum, hair loss, hair loss incident, blossom needle tapping, undergoing metabolic bariatric surgery, blossom needle, metabolic bariatric surgery, traditional chinese medicine technique, various types of hair loss, efficacy, safety of plum

Funders Acknowledgements:

the Zhejiang Province Traditional Chinese Medicine Science and Technology Plan Project

Grant ID: 2025ZL517

Abstract

Introduction

Obese female patients tend to pay more attention to their own appearance. Postoperative hair loss affects female patients' expectations for metabolic bariatric surgery and postoperative compliance, further affecting the weight loss effect. The treatment strategy for such patients should also pay attention to post-weight loss hair loss. Plum-blossom needle tapping and ginger juice rubbing are traditional Chinese medicine techniques, which have a long history, are economical and have few side effects. Through stimulation of specific acupoints, they can improve the endocrine level of patients and treat various types of hair loss. Therefore, it has a good prospect to use plum-blossom needle tapping and ginger juice to prevent hair loss in female patients after metabolic bariatric surgery.

Objectives

This study aims to evaluate the efficacy and safety of plum-blossom needle tapping combined with ginger juice rubbing in preventing hair loss in obese patients after metabolic bariatric surgery, and to explore the independent and interactive effects of the two interventions.

Methods

This study is a randomized, multi-center controlled pilot trial. This is a prospective, single-center, randomized controlled trial with a 2×2 factorial design. A total of 96 female obese patients undergoing metabolic bariatric surgery will be randomly assigned to four groups: control group, plum-blossom needle tapping group, ginger juice rubbing group, and combined treatment group. The intervention period will last 3 months. The primary outcome measure is the hair loss incident assessed by trichoscopy within 3 and 6 months after treatment. Secondary outcome measures include nutrition-related biochemical indicators, Traditional Chinese Medicine syndrome scores, SF-36, appearance anxiety and VAS. A single-blind design will be applied, and outcome assessment will be performed by evaluators blinded to group allocation. Through a rigorous randomized controlled trial design, this study will systematically evaluate the preventive effect of plum-blossom needle tapping and ginger juice rubbing on hair loss after metabolic bariatric surgery.

Conclusions

This trial will provide preliminary data on the effect of plum-blossom needle tapping and ginger juice rubbing on the prevention of postoperative hair loss in female obese patients. These findings are expected to provide a basis and reference for subsequent large-scale clinical research. It also provides new and green intervention methods for female obese patients.

Trial registra on: ChiCTR, ChiCTR2500111706. Registered 4 November 2025, <https://www.chictr.org.cn/bin/project/edit?pid=222523>.

Attachments



[20260511.docx](#)

65KB

Materials

Plum-blossom needle, 2% povidone-iodine, 75% alcohol, fresh and juicy ginger

- 1 This study protocol aims to evaluate the efficacy and safety of plum-blossom needle tapping combined with ginger juice rubbing in preventing hair loss in female obese patients after MBS. A 2×2 factorial design will be adopted to explore the independent and potential interactive effects of these two interventions. The results of this study are expected to provide preliminary evidence for clarifying the therapeutic effects of these TCM interventions, support their rational application in clinical practice, and thus offer a new perspective for the application of TCM-based nursing strategies in this patient population.

Trial design

- 2 This is a prospective, single-center, randomized controlled trial adopting a 2×2 factorial design. The two factors included in the trial are plum-blossom needle tapping and ginger juice rubbing, each with two levels (applied/not applied). The design of plum-blossom needle tapping is based on the Standards for Reporting Interventions in Clinical Trials of Acupuncture (STRICTA 2010) and the Acupuncture Control Assessment and Reporting Template (ACURATE). The overall trial design complies with the requirements of the Standard Protocol Items: Recommendations for Interventional Trials (SPIRIT 2013). A total of 96 female obese patients who underwent MBS will be enrolled in this study and randomly divided into 4 groups with 24 cases in each group. All groups will receive routine postoperative care and treatment, on the basis of which different experimental interventions will be implemented. Specifically, the control group will receive only health education and nursing; the plum-blossom needle group will undergo scalp meridian tapping with plum-blossom needles; the ginger juice group will receive scalp rubbing with ginger juice; and the combined treatment group will receive both plum-blossom needle tapping and ginger juice rubbing simultaneously. Plum-blossom needles treatment will be performed in accordance with the Chinese national standard GB/T 21709.2-2021 and the 5th edition of Acupuncture Science. Efficacy will be evaluated at 5 time points: baseline, 1 month, 2 months, 3 months, and 6 months after treatment.

Participant recruitment

- 3 This study will recruit subjects from eligible populations at the Department of Gastrointestinal Surgery/Metabolic and Bariatric Center of Ningbo No.2 Hospital in China, through multiple channels including distributing brochures, posting recruitment notices and pushing recruitment information via WeChat official account. A total of 96 female obese patients scheduled to receive MBS are planned to be enrolled. All subjects will receive professional diagnosis and treatment services provided by the research team, and the costs related to physical examination and scale evaluation will be borne by the research team. It should be specially noted that the costs of drug treatment, rehabilitation treatment and acupuncture treatment required by subjects shall be borne by themselves. Subjects' participation in this trial is entirely voluntary. The research team

encourages all potential subjects to fully consult researchers on trial-related content before deciding to participate, until they fully and clearly understand the specific process, potential risks and possible benefits of the trial. In addition, all eligible patients will be informed of the study grouping scheme and must sign a written informed consent form before completing the baseline evaluation to be formally enrolled. The eligibility review for enrollment is undertaken by the expert team of the Department of Gastrointestinal Surgery/Metabolic and Bariatric Center of the hospital, which determines whether patients meet the study enrollment criteria through systematic evaluation. The initial evaluation will be completed by two evaluators who are unaware of the study grouping. Both evaluators are professional health practitioners with master's degrees in surgery, ensuring the objectivity of the evaluation results. Meanwhile, all subjects are informed that they can voluntarily withdraw their informed consent at any time during the study without any adverse impact. During the treatment and intervention period, researchers will systematically collect and dynamically monitor the relevant clinical and evaluation data of subjects, including gender, age, course of disease and various scale evaluation reports, so as to provide reliable data support for study analysis.

3.1 Inclusion criteria: To ensure the homogeneity and safety of subjects as well as the reliability of study results, subjects enrolled in this study must strictly meet the following 4 core criteria, all of which need to be jointly evaluated and confirmed by the research team and relevant experts:

(1).Meet the diagnostic criteria for obesity: In accordance with the clinical diagnostic specifications for obesity in the Chinese Guidelines for the Prevention and Treatment of Obesity (2022 Edition), the diagnosis is confirmed by physical examination, body mass index (BMI) detection, body composition analysis and other examinations. Among them, $BMI \geq 28.0 \text{ kg/m}^2$, or $BMI \geq 24.0 \text{ kg/m}^2$ combined with at least one obesity-related metabolic complication (such as type 2 diabetes, hypertension, dyslipidemia, etc.).

Pseudo-obesity and secondary obesity (such as obesity caused by hypothyroidism, Cushing's syndrome and other diseases) are excluded.

(2).Suitable for primary MBS with laparoscopic sleeve gastrectomy: After comprehensive evaluation by the expert team of the Department of Gastrointestinal Surgery/Metabolic and Bariatric Center of Ningbo No.2 Hospital, subjects are clearly eligible for primary MBS, without absolute surgical contraindications (such as severe cardiopulmonary insufficiency, coagulation disorders, malignant tumors, severe gastrointestinal diseases, acute phase of mental illness, etc.), and their physical condition can tolerate the surgery, postoperative diagnosis and treatment, and follow-up procedures.

(3).Aged between 18 and 70 years old: Age is based on the information registered in the subject's ID card, ranging from 18 years old (inclusive) to 70 years old (inclusive), female ; subjects are conscious with normal cognitive function, able to clearly understand the study purpose, process and relevant precautions, and can cooperate with the research team to complete baseline evaluation, intraoperative observation, postoperative follow-up, filling in various scales, data collection and other work.

(4). Sign the informed consent form and be willing to participate in the study: Subjects voluntarily participate in this study, and sign a written informed consent form without any coercion or inducement after fully understanding the study purpose, research process, intervention measures, potential risks, possible benefits and follow-up requirements; they commit to strictly abide by the study protocol, complete all evaluations and follow-ups on time, and not withdraw from the study without authorization (if withdrawing due to personal reasons, they need to promptly inform the researchers and complete the relevant withdrawal evaluation).

3.2 Exclusion criteria: To avoid research confounding factors, ensure the safety of subjects and the accuracy of study results, any subject meeting any of the following criteria will be excluded from this study. The specific exclusion criteria are as follows:

(1). Presence of severe postoperative complications: Patients who have undergone MBS with uncontrolled complications such as anastomotic leakage and dumping syndrome; those scheduled for surgery with a clear tendency of high-risk postoperative complications that cannot be improved after preoperative evaluation.

(2). Presence of diseases affecting eating behavior: Patients with thyroid dysfunction, malignant tumors, anorexia nervosa, etc., which interfere with metabolism, eating and weight assessment.

(3). Presence of severe organ dysfunction: Patients with severe dysfunction of the heart, liver, kidneys and other organs or in critical condition, who cannot tolerate surgery and related interventions.

(4). Presence of other types of hair loss or scalp diseases: Patients with non-study-related hair loss such as alopecia areata and seborrheic alopecia, or scalp eczema, damage, etc., who cannot cooperate with plum-blossom needle and ginger juice interventions.

(5). History of hair transplantation: Patients who have previously undergone hair transplantation, which affects the evaluation of intervention efficacy.

(6). Current participation in other clinical trials: Patients participating in other studies simultaneously, which may interfere with the results of this study.

(7). Need for reparative surgery: Patients who need recent reparative surgery, which interferes with the intervention process of this study.

(8). Suffering from mental illness or physical disability: Patients who cannot cooperate with study evaluation, intervention and follow-up.

(9). Being pregnant or lactating: Female subjects who are pregnant or lactating, which may affect their own health as well as the health of fetuses and infants.

(10). Allergy to ginger: Patients with a clear allergy to ginger or ginger products, who cannot accept ginger juice intervention.

3.3 Withdrawal and Termination criteria: Subjects will be withdrawn from the study if they meet any of the following conditions:

(1). Loss to follow-up.

(2). Unexpected pregnancy or occurrence of severe adverse reactions during the study, making it impossible to continue treatment.

(3).Deterioration of the condition or emergence of new, severe complications.

(4).Voluntary withdrawal of informed consent and request to exit the study.

- 3.4 **Participant characteristics:** At baseline, demographic information and the following characteristics will be collected from patients: age, BMI value, marital status, educational level, employment status, substance use (alcohol consumption and smoking), as well as the number and names of other diseases.

Randomization, allocation concealment, and blinding

- 4 This study adopts simple randomization (random number table method) for grouping. Researchers not involved in screening and intervention will generate random numbers from 1 to 4 using statistical software (corresponding to the control group, plum-blossom needle group, ginger juice group, and combined treatment group respectively). The random number table and the corresponding relationship of grouping will be sealed and stored until the end of the study. After subjects complete the baseline evaluation and sign the informed consent form, specially assigned personnel will assign numbers in the order of the random number table to determine their respective study groups, and the grouping process will be kept confidential. Meanwhile, a third party will verify the grouping results. A total of 24 subjects are planned to be enrolled in each group (96 cases in total). When a subject drops out, supplementary enrollment will be conducted according to the random number table to maintain the balance of sample size, ensuring that each enrolled subject has an equal chance to enter any group and reducing bias. To reduce assessment and detection bias, a single-blind method is adopted. That is, the two evaluators (health professionals with master's degrees in surgery) responsible for baseline evaluation, postoperative follow-up, and detection of efficacy indicators of subjects are unaware of the grouping status of subjects. They are only responsible for completing objective evaluations and data recording to ensure the objectivity of the assessment results.

Sample size

- 5 This study adopts a 2×2 factorial design, with "metabolic weight loss effect and scalp intervention-related efficacy" as the primary outcome measures. Combined with the statistical requirements of clinical research and with reference to similar studies on metabolic weight loss combined with TCM intervention, sample size estimation was conducted to ensure the study has sufficient statistical power. The specific design is as follows: Basis for sample size estimation: The sample size was estimated using statistical software (G*Power 3.1). The significance level α was set at 0.05 (two-tailed), the test power $1-\beta$ at 0.80, and the inter-group effect size Cohen's d at 0.5 with reference to the results of similar studies. Meanwhile, a 10% subject dropout rate was considered to estimate the required sample size per group. After estimation, each group needs to

include at least 22 subjects; considering the 10% dropout rate, 24 subjects are planned to be enrolled in each group, with a total of 96 subjects in the 4 study groups.

Intervention

- 6 Subjects will be divided into four groups: the control group will receive no additional interventions; the plum-blossom needle group will undergo scalp meridian tapping treatment with plum-blossom needles; the ginger juice group will receive scalp rubbing with ginger juice; and the combined treatment group will receive both plum-blossom needle tapping and ginger juice rubbing simultaneously. All subjects in each group are required to complete a fixed course of treatment. The intervention will be carried out in accordance with version 2.0 of the protocol.
- 6.1 **Control Group** Patients will receive routine postoperative care and health management. At the time of enrollment, a case manager will provide guidance to patients according to the continuous care plan after MBS. The guidance will be conducted on the day of enrollment (through face-to-face guidance in the ward), on the 7th day after surgery via telephone/video call, as well as at 1 month and 3 months after surgery. Considering the clinical characteristics of hair loss after MBS and the current status of its management, a routine care and health management plan was formulated based on a summary of the best available evidence on hair loss after MBS, ensuring compliance with ethical requirements. The main components of this control intervention are as follows: the treatment plan for all patients is determined by their clinicians. Routine acid-suppressive therapy and gastric mucosal protection therapy will be performed within the first month after surgery. The continuity of the care plan is formulated and implemented by each patient's care manager, mainly including:
- (1).Lifestyle guidance: guidance on postoperative diet, rest, exercise and other behavioral adjustments.
 - (2).Diet management: follow the dietary plan after MBS, with a daily fluid intake of 1500 to 2000 milliliters. The diet should be light, avoiding spicy and irritating foods.
 - (3).Activity and rest: maintain a regular sleep schedule. Patients should learn to regulate their emotions and avoid excessive worry or significant mood swings.
 - (4).Physical activity: balance work and rest, and engage in appropriate daily activities to enhance physical fitness.
- Nursing staff will maintain contact with patients through the Internet, answer questions in a timely manner, and encourage them to adhere to these healthy lifestyles.
- 6.2 **Plum-Blossom Needle Group:** In addition to routine postoperative care and health management, patients in this group will also receive plum-blossom needle tapping therapy. The operation steps are as follows: let the patient sit upright, first disinfect the thinned areas of the scalp and the corresponding acupoints (Table 2) with 2% povidone-iodine, and then disinfect again with 75% alcohol. Subsequently, the therapist will gently tap the plum-blossom needle (Figure 1) through brisk wrist movements. The needle will be evenly tapped on the thinned areas of the scalp, with emphasis on the acupoints

selected for treatment. The tapping time for each area/acupoint is 2-3 minutes. The tapping intensity is considered sufficient when local skin redness, swelling and a small amount of petechiae appear. Treatment will be performed once a day from the 1st to the 3rd day after surgery (discharge day), and then once a week thereafter, with a total treatment duration of 3 months.

- 6.3 **Ginger Juice Group:** In addition to routine postoperative care and health management, patients in this group will also receive ginger juice rubbing therapy. The specific process is as follows: after washing the hair and scalp, the patient will be instructed to take a fresh and juicy ginger root, remove its outer skin, and then repeatedly rub it on the areas with sparse hair until a local burning sensation is felt. Rinse off the ginger residue with warm water after 30 minutes. This treatment will be performed once every three days for a total of 3 months.
- 6.4 **Combined Therapy Group:** In addition to routine postoperative care and health management, patients in this group will receive combined treatment, including ginger juice rubbing after plum-blossom needle tapping. The total duration of the treatment is 3 months.

Outcome measures

- 7 **Primary outcome measures:** Trichoscopy can non-invasively and intuitively observe the state of the hair follicle cycle and accurately assess the proportion of telogen hairs. It is a commonly used objective method for the clinical diagnosis of telogen effluvium, which can replace invasive scalp biopsy and histopathological examination to a certain extent, with the advantages of non-invasiveness, convenience and repeatability. In this study, "the proportion of telogen hairs under trichoscopy > 25%" was defined as a hair loss event. The formula for calculating the Event Rate (ER) of hair loss events is as follows: $ER = (\text{number of hair loss cases in the group} / \text{total number of cases in the group}) \times 100\%$. With reference to the efficacy evaluation criteria in the "Guiding Principles for Clinical Research of New Chinese Medicines", the intervention effect was divided into 4 grades: (1) Excellent (near-complete prevention): $ER < 30\%$; (2) Marked effect: $30\% \leq ER < 50\%$; (3) Effective: $50\% \leq ER < 75\%$; (4) Ineffective: $ER \geq 75\%$. Meanwhile, with the event rate of the control group as the Control Event Rate (CER) and the event rate of each intervention group as the Experimental Event Rate (EER), the Relative Risk Reduction (RRR) was calculated. The formula is: $RRR = [(CER - EER)/CER] \times 100\%$. The improvement effect of different intervention schemes on hair loss risk was quantitatively evaluated by RRR.
- Assessment time points: baseline evaluation, 3 months after treatment and 6 months after treatment.

Outcome measures

- 8 **Secondary outcome measures:** (1).Biochemical indicators: Including hemoglobin, serum albumin, prealbumin, and serum trace elements (iron, copper, zinc). The case manager will remind patients to maintain a light diet online (by telephone or WeChat) one day before blood collection. Venous blood will be collected uniformly by nurses 3 months after surgery and sent to the laboratory for testing.
Assessment time points: baseline evaluation, 3 months after treatment and 6 months after treatment.
- (2).TCM syndrome score: The scoring standard was formulated with reference to the "Introduction to the Four-Level Weighted Scoring Method for Clinical Diagnosis and Efficacy Judgment", including 5 subjective symptoms (tongue coating and pulse condition are not included in the scoring): sparse hair, fatigue and weakness, abdominal distension and fullness, soreness and weakness of the waist and knees, and insomnia with many dreams. The mean value was calculated based on the independent evaluations of two traditional Chinese medicine physicians, each with an intermediate professional title or higher and over 10 years of clinical experience. Each item is scored on a scale of 0 to 3, with a total score ranging from 0 to 15. A higher score indicates more severe TCM syndromes .
Assessment time points: baseline evaluation, 3 months after treatment and 6 months after treatment.
- (3).Quality of life: The patient was assessed by the same case manager using standardized instructions. Evaluated using the Chinese version of the 36-Item Short Form Health Survey (SF-36). The scale covers 8 dimensions: physical function, role physical, bodily pain, general health, vitality, social function, role emotional, and mental health. A higher score indicates better quality of life.
Assessment time points: baseline evaluation, 1 month after treatment, 2 months after treatment 3 months after treatment and 6 months after treatment.
- (4).Appearance anxiety: The patient was assessed by the same case manager using standardized instructions. Evaluated using the Appearance Anxiety Questionnaire compiled by Zhang Huangbin et al.. The scale includes 3 dimensions and a total of 22 items: body image dissatisfaction, individual attention bias, and social environmental pressure. A higher score indicates a higher level of appearance anxiety.
Assessment time points: baseline evaluation, 1 month after treatment, 2 months after treatment 3 months after treatment and 6 months after treatment.
- (5).Pain score: The patient was assessed by the same case manager using standardized instructions. The Visual Analogue Scale (VAS) was used to assess the degree of pain during scalp intervention, with 0 indicating no pain and 10 indicating the most severe pain.
Assessment time points: baseline evaluation, 1 month after treatment, 2 months after treatment 3 months after treatment and 6 months after treatment.

Safety indicators

- 9 All adverse events during the study will be recorded, including scalp redness and swelling, damage, infection, allergy, nausea, discomfort, etc., to evaluate the safety of the intervention. The incidence of adverse events = (number of patients with adverse events / total number of patients) × 100%. Any abnormal situation will be reported to the doctor immediately for symptomatic treatment. The causes will be analyzed, and all adverse events and their outcomes will be recorded.
Assessment time points: baseline evaluation, 1 month after treatment, 2 months after treatment 3 months after treatment and 6 months after treatment.

Dropout rate

- 10 The number of dropouts/withdrawals of subjects in each group during the study will be recorded and counted, and the dropout rate will be calculated.
Assessment time points: baseline evaluation, 1 month after treatment, 2 months after treatment 3 months after treatment and 6 months after treatment.

Data management

- 11 **1 Data Collection and Quality Control**
This study follows the norms of real-world research to ensure the authenticity and completeness of original data; uniformly trained researchers will directly enter the subjects' baseline data, scale evaluation results and objective detection indicators into the Case Report Form (CRF). The CRF must be filled out completely. If corrections are needed for original records, the cross-out correction method will be adopted (retaining the original record, indicating the correction date, reason and signature of the corrector), and arbitrary alterations are strictly prohibited.
- 2 Data Storage and Safety Management**
All documents, evaluation reports and clinical results generated during the study will be classified, numbered and archived in an orderly manner in a dedicated archive room in accordance with the hospital's file management standards to achieve rapid and efficient retrieval. Unauthorized personnel are strictly prohibited from accessing relevant data.
- 3 Data Monitoring and Quality Assurance**
Monitors will conduct regular monitoring work, covering whether there are errors or omissions in the original data, whether all CRFs are complete and accurate, and whether there are deviations between them and the original data.

Statistical analysis methods

- 12 Data will be double-checked before entry, and statistical analysis will be performed using SPSS 25.0 software. Continuous variables that conform to normal distribution will be expressed as mean ± standard deviation (SD); paired t-test will be used for intragroup comparison, and one-way analysis of variance (ANOVA) and LSD post-hoc test will be used for intergroup comparison. If continuous variables do not conform to normal

distribution, they will be expressed as median and interquartile range; Wilcoxon paired rank-sum test will be used for intragroup comparison, and Kruskal-Wallis H test with Bonferroni correction will be used for intergroup comparison. Binary and nominal categorical data will be described by frequency and composition ratio, and χ^2 test or Fisher's exact test will be used for intergroup comparison; ordinal categorical data will be described by frequency and proportion, and Kruskal-Wallis H test will be used for intergroup comparison. All statistical tests are two-tailed, and $P < 0.05$ is considered statistically significant.

Quality control

- 13 Both intervention and evaluation will be completed by professionally trained acupuncturists and rehabilitation therapists. In accordance with relevant regulations, if adverse events occur during the study, the research team will bear the subsequent medical expenses of the subjects; if severe adverse events require hospitalization, corresponding compensation such as nutrition fees and lost work expenses will be provided

Ethics and dissemination

- 14 This study protocol complies with the requirements of the 2013 version of the Declaration of Helsinki. All subjects participate voluntarily, are fully informed before the start of the trial, and sign a written informed consent form. The study results can only be published with the approval of the principal investigator. All subjects' information will be strictly kept confidential in accordance with relevant regulations and will not be disclosed without permission; subsequent research results may be published in academic conferences or journals without disclosing any personal identity information. The findings are expected to offer new evidence for the development of traditional Chinese medicine-based comprehensive care strategies after MBS.

Protocol references

- 1. Wang Y, Zhao L, Gao L, et al. Health policy and public health implications of obesity in China. *Lancet Diabetes Endocrinol.* Jul 2021;9(7):446-461. doi:10.1016/s2213-8587(21)00118-2**
- 2. Di Lorenzo N, Antoniou SA, Batterham RL, et al. Clinical practice guidelines of the European Association for Endoscopic Surgery (EAES) on bariatric surgery: update 2020 endorsed by IFSO-EC, EASO and ESPCOP. *Surg Endosc.* Jun 2020;34(6):2332-2358. doi:10.1007/s00464-020-07555-y**
- 3. Zhang W, Fan M, Wang C, et al. Hair Loss After Metabolic and Bariatric Surgery: a Systematic Review and Meta-analysis. *Obes Surg.* Jun 2021;31(6):2649-2659. doi:10.1007/s11695-021-05311-2**
- 4. Taghizadeh N, Salhab H, Alirezai A, et al. Hair Loss and Metabolic and Bariatric Surgery: An Updated Systematic Review and Meta-analysis. *Obes Surg.* Jun 2025;35(6):2370-2380. doi:10.1007/s11695-025-07903-8**
- 5. Cohen-Kurzrock RA, Cohen PR. Bariatric Surgery-Induced Telogen Effluvium (Bar SITE): Case Report and a Review of Hair Loss Following Weight Loss Surgery.**

Cureus. Apr 21 2021;13(4):e14617.

doi:10.7759/cureus.14617

6. Gletsu-Miller N, Wright BN. Mineral malnutrition following bariatric surgery. Adv Nutr. Sep 1 2013;4(5):506-17. doi:10.3945/an.113.004341

7. Ong MM, Li Y, Lipner SR. Oral Minoxidil for Alopecia Treatment: Risks, Benefits, and Recommendations. Am J Clin Dermatol. Jan 2026;27(1):101-119.

doi:10.1007/s40257-025-00990-4

8. Alyahya RA, Alnujaidi MA. Prevalence and Outcomes of Depression After Bariatric Surgery: A Systematic Review and Meta-Analysis. Cureus. Jun 2022;14(6):e25651.

doi:10.7759/cureus.25651

9. Fan L, He Y, Li Y, et al. Efficacy and safety of traditional Chinese medicine nursing intervention in postoperative patients after gastrectomy. Oncol Lett. Dec 2023;26(6):537. doi:10.3892/ol.2023.14124

10. Tang S, Lin J, Li G, et al. Evaluating efficacy and mechanism of traditional Chinese medicine in diabetes treatment: a meta-analysis and network pharmacology study. Front Endocrinol (Lausanne). 2025;16:1605091.

doi:10.3389/fendo.2025.1605091

- 11. Tang G, Xiong J, Fan Q, et al. Plum-blossom needle plus Chinese herbal medicine for alopecia areata: A protocol for systematic review and meta analysis. *Medicine (Baltimore)*. Oct 9 2020;99(41):e22515. doi:10.1097/md.00000000000022515**
- 12. Dai T, Song N, Li B. Add-on effect of plum-blossom needling in alopecia areata: a qualitative evidence synthesis. *Ann Palliat Med*. Mar 2021;10(3):3000-3008. doi:10.21037/apm-20-1969**
- 13. Li Q, Xie Y, Zha X. The clinical effect of plum blossom needle acupuncture with qi-invigorating superficials-consolidating therapy on seborrheic alopecia. *Ann Palliat Med*. May 2020;9(3):1030-1036. doi:10.21037/apm-20-909**
- 14. Meng X, Sun J, Liu Q, et al. Efficacy and Safety of a Novel Plum Blossom Needling with Mild Moxibustion Device for Upper Limb Pain Disorder and Motor Dysfunction in Patients with Stage 1 Post-Stroke Shoulder-Hand Syndrome: Study Protocol for a Multi-Center, Single-Blind, Randomized Sham-Controlled Trial. *J Pain Res*. 2023;16:407-420. doi:10.2147/jpr.S396195**
- 15. Wang P, Xie F, Zhang L, et al. Plum-blossom needle tapping enhances the efficacy of ALA photodynamic**

- therapy for facial actinic keratosis in Chinese population: a randomized, multicenter, prospective, and observer-blind study. Photodiagnosis Photodyn Ther. Jun 2023;42:103611. doi:10.1016/j.pdpdt.2023.103611**
- 16. Zgonc Škulj A, Poljšak N, Kočevar Glavač N et al. Herbal preparations for the treatment of hair loss. Arch Dermatol Res. Aug 2020;312(6):395-406. doi:10.1007/s00403-019-02003-x**
- 17. Abbas AN. Ginger (Zingiber officinale (L.) Rosc) improves oxidative stress and trace elements status in patients with alopecia areata. Niger J Clin Pract. Nov 2020;23(11):1555-1560. doi:10.4103/njcp.njcp_59_19**
- 18. MacPherson H, Altman DG, Hammerschlag R, et al. Revised STandards for Reporting Interventions in Clinical Trials of Acupuncture (STRICTA): extending the CONSORT statement. PLoS Med. Jun 8 2010;7(6):e1000261. doi:10.1371/journal.pmed.1000261**
- 19. Lee YS, Kim SY, Lee H, et al. ACURATE: A guide for reporting sham controls in trials using acupuncture. J Evid Based Med. Mar 2023;16(1):82-90. doi:10.1111/jebm.12524**
- 20. Chan AW, Tetzlaff JM, Altman DG, et al. SPIRIT 2013 statement: defining standard protocol items for clinical**

- trials. Ann Intern Med. Feb 5 2013;158(3):200-7.
doi:10.7326/0003-4819-158-3-201302050-00583**
- 21. LIANG F R, H W. Science of Acupuncture and Moxibustion. 5th Edition ed. Beijing: China Press of Traditional Chinese Medicine; 2021:274. (in Chinese)**
- 22. Yu Z, Yang X, Qin F, et al. Effects of acupuncture synchronized rehabilitation therapy on upper limb motor and sensory function after stroke: a study protocol for a single-center, 2 × 2 factorial design, randomized controlled trial. Front Neurol. 2023;14:1162168.
doi:10.3389/fneur.2023.1162168**
- 23. Chinese Nutrition Society Obesity Prevention and Control Section, Chinese Nutrition Society Clinical Nutrition Section, Chinese Preventive Medicine Association Behavioral Health Section and Section CPMASaH. Expert Consensus on Obesity Prevention and Control among Chinese Residents. Journal of Xi'an Jiaotong University (Medical Edition). 2022;43(04):619-631. (in Chinese)**
- 24. Miteva M, Tosti A. Hair and scalp dermatoscopy. J Am Acad Dermatol. Nov 2012;67(5):1040-8.
doi:10.1016/j.jaad.2012.02.013**

25. China Food and Drug Administration. Notice from the General Administration on Issuing Four Technical Guidance Principles for Clinical Research of New Traditional Chinese Medicines, including General Principles of Clinical Research for New Traditional Chinese Medicines. 2026. Updated 2015.

<https://www.nmpa.gov.cn/xxgk/ggtg/ypggtg/ypqtggtg/20151103120001444.html> (in Chinese)

26. Zongzhao B, Chenglin L. Introduction to the Four-Level Weighted Scoring Method for Clinical Diagnosis and Therapeutic Effect Evaluation. Chinese Clinical Pharmacology and Therapeutics. 2000;(02):164-166. doi:10.3969/j.issn.1009-2501.2000.02.020 (in Chinese)

27. Mercadante V, Hamad AA, McCaul J, et al. Salivary Electrostimulation in the Treatment of Radiation Therapy-Induced Xerostomia (LEONIDAS-2): A Multicenter, Randomized, Double-Masked, Sham-Controlled, Phase 3 Trial. Int J Radiat Oncol Biol Phys. Jan 1 2024;118(1):142-153. doi:10.1016/j.ijrobp.2023.03.047

28. Huangbin Z, Rong L, Xinqiang W. Development and validation of the facial anxiety questionnaire: A study on its reliability and validity. Psychological Exploration and Research. 2024;44(06):566-574. (in Chinese)

- 29. Allam AT, El-Shiekh RA, El-Dessouki AM, et al. Pathophysiology, conventional treatments, and evidence-based herbal remedies of hair loss with a systematic review of controlled clinical trials. Naunyn Schmiedebergs Arch Pharmacol. Dec 2025;398(12):16311-16354. doi:10.1007/s00210-025-04286-6**
- 30. Ziyuan T, Qingwu L, Mingyue Z. Research on the Distribution of Traditional Chinese Medicine Syndromes in Patients with Alopecia Areata Based on Factor Analysis and Cluster Analysis. Chinese Journal of Traditional Chinese Medicine. 2023;64(24):2545-2552. doi:10.13288/j.11-2166/r.2023.24.011 (in Chinese)**

Acknowledgements

We would like to thank all the staff of Ningbo No.2 Hospital, China for their support for this study.