

Effects of Standardized Patients on Student Learning Outcome in Traditional Chinese Medicine Education: A Meta-Analysis

INPLASY2026100030

doi: 10.37766/inplasy2026.10.0030

Received: 7 October 2026

Published: 7 October 2026

Chen, YH; Hu, YM; Tian, H; Yang, XY; Wei, JW; Mao, YX; Liu, L; Xia, J; Xiong, Y; Zeng, F.

Corresponding author:

Yunhui Chen

chenyunhui@cdutcm.edu.cn

Author Affiliation:

Chengdu University of Traditional Chinese Medicine, Chengdu, Sichuan, China.

ADMINISTRATIVE INFORMATION

Support - This study was supported by the Sichuan Provincial Educational Project (JG2024-0642, JG2023-50, JG2023-51, JG2023-54); Key Research Base of Humanities and Social Sciences for Universities in Sichuan Province (Grant No. 25XTZX03); Higher Education Reform Project of Chengdu University of Traditional Chinese Medicine (Grant No. ZLGC202177, JGZD202007); the Higher Education Reform Project of Chengdu University of Traditional Chinese Medicine Social Science Fund for Universities of Sichuan Province (Grant No. 2021XT17); Shanghai Lun-Jin Ke Program of CDUTCM (Grant No. KCSZ2019003); and Youth Scholarship of CDUTCM (Grant No. QNXZ). The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY2026100030

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 7 October 2026 and was last updated on 7 October 2026.

INTRODUCTION

Review question / Objective To investigate the impact of standardized patient (SP) on traditional Chinese medicine (TCM) education by comparing its effectiveness to traditional pedagogy (TP).

Rationale SP pedagogy has gained increasing recognition in TCM education, but individual studies vary in design, sample size, and reported effect magnitudes, and their findings have not yet been systematically synthesized. While meta-analyses have accumulated in general medical and nursing education, no systematic synthesis has specifically examined SP pedagogy in TCM

education. TCM educators and institutions currently lack a pooled estimate of SP's effects, which limits their ability to make evidence-informed decisions about SP implementation. By providing quantitative estimates of SP effectiveness, this study can support curricular decisions that strengthen students' clinical competencies and, in turn, the quality of patient care they deliver.

Condition being studied This review focuses on educational outcomes in TCM education. The condition being studied is not a disease but a SP pedagogical intervention and its effects on student learning outcomes. TCM education aims to cultivate healthcare professionals with solid

theoretical foundations and robust clinical competencies, including TCM diagnostic methods (observation, auscultation, inquiry, and palpation) and treatment based on pattern differentiation.

METHODS

Search strategy Eight electronic databases were searched from inception to May 15, 2024: China National Knowledge Infrastructure, Chinese VIP Information Database, Chinese Wanfang Database, Chinese Biological Medicine Database, PubMed, Cochrane Library, Web of Science, and EMBASE. Search terms included: standardized patient, simulated patient, sample patient, patient actor, patient instructor, SP, traditional Chinese medicine, Chinese Medicine, Chinese pharmacy, herbal medicine, Chinese Materia Medica, pharmaceutical, comparison, comparative study, randomization, and randomized control. Manual searches were also conducted on references of retrieved studies.

Participant or population Students in TCM education of any demographics.

Intervention Implementation of SP pedagogy, alone or with other instructional approaches.

Comparator Traditional pedagogy (TP), such as lecture-based learning (LBL), in TCM curricula.

Study designs to be included Randomized controlled studies.

Eligibility criteria Inclusion: (1) randomized controlled studies; (2) students in TCM education of any demographics; (3) implementation of SP pedagogy, alone or with other instructional approaches; (4) comparator: TP such as LBL in TCM curricula; (5) primary outcomes included theoretical exam scores, practical skill exam scores, and comprehensive exam scores; secondary outcomes included communication skills, DREEM, and student preferences and endorsements.

Exclusion: literature reviews, duplicates, non-RCTs, non-empirical research, non-TCM education related studies, studies using simulation modalities other than SP (e.g., virtual patients or mannequin-based simulation), and reports lacking complete datasets necessary for effect size calculation.

Information sources Eight electronic databases: China National Knowledge Infrastructure, Chinese VIP Information Database, Chinese Wanfang Database, Chinese Biological Medicine Database,

PubMed, Cochrane Library, Web of Science, and EMBASE. Manual searches of reference lists of retrieved studies were also conducted.

Main outcome(s) Primary outcomes: theoretical exam scores, practical skill exam scores, and comprehensive exam scores.

Additional outcome(s) Secondary outcomes: communication skills, the Dundee Ready Educational Environment Measure (DREEM) across five domains (learning perception, teacher perception, academic self-perception, learning environment perception, and social self-perception), and student preferences and endorsements regarding the impact of SP pedagogy on learning enthusiasm, critical thinking ability, problem-solving ability, and caring ability.

Data management Data were extracted independently by two reviewers using a predefined data extraction form comprising study identification, first author, year of publication, sample size, curriculum subject, participant demographics, SP and TP implementation details, and outcome metrics. Discrepancies were resolved through consultation with a third reviewer. All collected data underwent meticulous cross-verification before processing in RevMan V.5.3 software.

Quality assessment / Risk of bias analysis Each included study was independently assessed for risk of bias by two reviewers using the Cochrane risk-of-bias tool for randomized trials. Risks were categorized as high, unclear, or low across seven domains: randomization sequence generation, allocation concealment, participant blinding, personnel blinding, outcome assessor blinding, incomplete outcome data, selective reporting, and other biases. Inconsistencies were resolved through consultation with a third reviewer. The GRADE framework was applied to assess the certainty of evidence for each outcome using GRADEpro GDT.

Strategy of data synthesis Quantitative synthesis was conducted with RevMan 5.3. Continuous variables were measured using SMD or MD with 95% CIs, and dichotomous data were examined through risk ratios (RR) with 95% CIs. Statistical heterogeneity was assessed using the chi-square statistic and I^2 statistic. A fixed-effects model was employed for low heterogeneity ($I^2 \leq 50\%$). Statistical significance was set at $P < 0.05$. Publication bias was assessed using funnel plots for outcomes with ten or more studies, and Egger's test was performed. Secondary outcomes from self

administered questionnaires were synthesized narratively as descriptive proportions rather than pooled effect estimates.

Subgroup analysis Subgroup analyses were executed to elucidate potential sources of substantial heterogeneity and to evaluate the pedagogical effects of SP used alone versus as an adjunctive approach, as these two implementation modes differ in instructional intensity, learner engagement, and educational context.

Sensitivity analysis Sensitivity analyses were undertaken to evaluate the robustness of pooled results by removing individual studies sequentially.

Language restriction No language restrictions were imposed.

Country(ies) involved China.

Keywords Standardized patient pedagogy; student learning outcomes; Traditional Chinese Medicine education; meta-analysis.

Contributions of each author

Author 1 - Chen Yunhui.

Email: chenyunhui@cdutcm.edu.cn

Author 2 - Yimei Hu.

Email: huyimei@cdutcm.edu.cn

Author 3 - Hao Tian.

Email: 37715404@qq.com

Author 4 - Xinyue Yang.

Email: lucymumu@163.com

Author 5 - Jingwen Wei.

Email: jingwen_alldora@qq.com

Author 6 - Yaoxuan Mao.

Email: maoyaoxuan@stu.cdutcm.edu.cn

Author 7 - Liu Liu.

Email: 419161168@qq.com

Author 8 - Jun Xia.

Email: xiajun@cdutcm.edu.cn

Author 9 - Ying Xiong.

Email: xiongying@wchscu.cn

Author 10 - Fang Zeng.

Email: zengfang@cdutcm.edu.cn