

The Mediating Role of Out-of-Hospital Adherence between Health Literacy and Quality of Life in Chinese Stroke Survivors: A Cross-Sectional Study

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INTRODUCTION & AIM

Introduction

Stroke imposes a substantial burden in China, with many survivors experiencing poor health literacy (HL) and rehabilitation adherence, leading to diminished quality of life (QoL). HL is considered crucial for improving adherence and QoL, yet the specific mediating pathway of out-of-hospital adherence between HL and QoL among Chinese stroke survivors remains insufficiently quantified and empirically validated.

Aim

This cross-sectional study aimed to: (1) describe the levels of HL, out-of-hospital adherence, and QoL; (2) examine their interrelationships; and (3) test the hypothesis that out-of-hospital adherence partially mediates the association between HL and QoL in Chinese stroke survivors.

METHOD

Theoretical Framework

Given the ambiguity in existing frameworks linking health literacy to health outcomes, this study integrates Baker's (2006) definition, the health literacy-outcomes model, and the Health Literacy Skills (HLS) model to form its theoretical basis. These models posit that health literacy influences ultimate outcomes (e.g., Quality of Life) through mediating variables. This investigation focuses on testing the specific pathway where out-of-hospital adherence mediates the relationship between health literacy and QoL in stroke survivors, as highlighted in Figure 1.

Design

A cross-sectional design was employed.

Study population and procedures

From August 2023 to February 2024, 520 stroke survivors were recruited via convenience sampling from four Shanghai TCM hospitals. An a priori power analysis (G*Power 3.1) for multiple linear regression (10 predictors, $f^2=0.05$, power=95%, $\alpha=0.05$) determined a required sample of 473; 520 were targeted accounting for 10% attrition. Inclusion criteria: 1-6 months post-stroke/TIA, stable, proficient in communication, and willing to participate. Exclusion criteria: severe complications/cognitive impairment, sensory/mental barriers to assessment, healthcare employment, or voluntary withdrawal.

Measurements

- Demographic Characteristics:** 13 variables were assessed (e.g., gender, age, income).
- Health Literacy:** Measured using a validated 48-point simplified Chinese questionnaire (Cronbach's $\alpha=0.91$) covering memory, comprehension, application, and analysis. Scores ≥ 36 indicate adequate literacy.
- Out-of-Hospital Adherence:** Assessed via the 25-item OHAQ-SP (Cronbach's $\alpha=0.902$), a validated tool for Chinese stroke survivors covering medication, self-monitoring, rehabilitation, and lifestyle adherence. Scores range from 25-125.
- Stroke-Specific Quality of Life (SS-QOL):** Evaluated using a culturally adapted 49-item scale (Cronbach's $\alpha=0.76$) across 12 domains. Total scores range from 49-245, with higher scores indicating better QoL.

RESULTS & DISCUSSION

Results

Among 509 stroke survivors, the average health literacy score was 31.40 ± 1.33 , indicating moderate proficiency. Single-factor analysis identified several significant determinants: health literacy increased with higher education, was greater in urban versus rural residents ($F=4.76$, $P<0.01$), higher in non-first-episode versus first-episode patients ($t=-2.442$, $P<0.05$), higher in patients without sequelae ($F=4.960$, $P<0.01$), and higher in those with an annual income $>20,000$ yuan ($F=2.838$, $P<0.05$). Hierarchical regression showed that a model including control variables (education, income, sequelae) explained 9.2% of the variance in health literacy. Adding out-of-hospital adherence and quality of life significantly increased explanatory power to 24.4% ($\Delta R^2=0.152$, $P<0.001$).

Correlation analysis revealed health literacy had a weak positive correlation with out-of-hospital adherence ($r=0.223$, $p<0.001$) and a moderate correlation with quality of life ($r=0.409$, $p<0.001$). Adherence itself showed a stronger correlation with quality of life ($r=0.461$, $p<0.001$). A mediation analysis confirmed a partial mediation model. Health literacy had a significant total effect on quality of life ($\beta=0.409$, $P<0.001$). When including adherence, health literacy's direct effect remained significant ($\beta=0.322$, $P<0.001$) while adherence showed a strong independent effect ($\beta=0.390$, $P<0.001$). Bootstrapping indicated that out-of-hospital adherence mediated 21.27% of health literacy's total effect on quality of life (indirect effect=0.087, 95% CI: 0.048-0.134), with 78.73% being a direct effect.

Discussion

This study reveals suboptimal health literacy among stroke survivors, marked by a critical "knowledge-behavior gap" where recall is stronger than application and analysis. Literacy is significantly shaped by social determinants: educational attainment, urban residence (reflecting resource access), experiential learning from recurrent episodes, higher income, and absence of sequelae, highlighting socioeconomic and urban-rural disparities.

The association between health literacy and quality of life is predominantly direct (78.7%), underscoring the central role of cognitive factors like improved processing of information and self-efficacy. A smaller portion (21.3%) is mediated through out-of-hospital adherence, forming a "cognitive-behavioral loop" vulnerable where analytical knowledge fails to translate into action.

Consequently, multi-level interventions are imperative. Education must utilize cognitive-friendly tools focusing on application, delivered digitally to bridge geographic gaps. Support should be tailored (e.g., motivational interviewing for first-time patients, peer groups for recurrent cases), and systems must enhance care integration. Financial support is essential to overcome cost-related barriers for low-income survivors.

CONCLUSION

Health literacy was directly associated with quality of life in stroke survivors, with out-of-hospital adherence serving as a partial mediator. These findings suggest that interventions focusing on analytical and practical health literacy skills, particularly for rural and less-educated populations, may help address health disparities. Future longitudinal or experimental studies are needed to confirm these associations and establish causal relationships.

FUTURE WORK / REFERENCES

Building on this cross-sectional evidence, future research should prioritize longitudinal designs to establish causal relationships and examine how health literacy, adherence, and quality of life dynamically interact over the stroke recovery trajectory.

Reference

- [1] Kuriakose D, Xiao Z. Pathophysiology and treatment of stroke: present status and future perspectives. *Int J Mol Sci.* 2020;21:7609.
- [2] GBD 2021 Stroke Risk Factor Collaborators. Global, regional, and national burden of stroke and its risk factors, 1990-2021: a systematic analysis for the Global Burden of Disease Study 2021. *Lancet Neurol.* 2024; 23: 973-1003.

Fig.1 Theoretical Framework

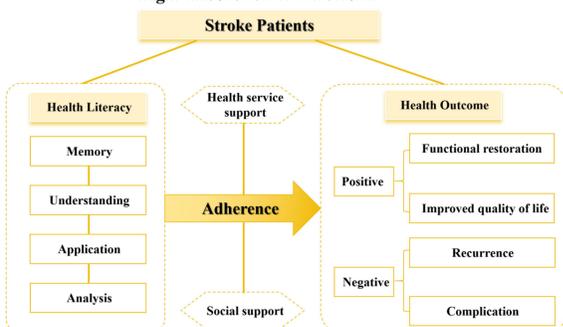


Fig.2 Indirect Effect Model

