

# Effectiveness of Goal-Setting Telephone Follow-Up on Health Behaviors of Patients with Ischemic Stroke: A Randomized Controlled Trial

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*Background:* Adopting healthy behaviors is critical for secondary stroke prevention, but many patients fail to follow national guidelines regarding diet, exercise, and abstinence from risk factors. Compliance often decreases with time after hospital discharge, yet few studies have examined programs promoting long-term adherence to health behaviors. Goal setting and telephone follow-up have been proven to be effective in other areas of medicine, so this study evaluated the effectiveness of a guideline-based, goal-setting telephone follow-up program for patients with ischemic stroke. *Methods:* This was a multicenter, assessor-blinded, parallel-group, randomized controlled trial. Ninety-one stroke patients were randomized to either a control group or an intervention group. Intervention consisted of pre-discharge education and 3 goal-setting follow-up sessions conducted by phone. Data were collected at baseline and during the third and sixth months after hospital discharge. *Results:* Six months after discharge, patients in the intervention group exhibited significantly higher medication adherence than patients in the control group. There were no statistically significant differences in physical activity, nutrition, low-salt diet adherence, blood pressure monitoring, smoking abstinence, unhealthy use of alcohol, and modified Rankin Scale (mRS) scores between the 2 groups. *Conclusions:* Goal-setting telephone follow-up intervention for ischemic stroke patients is feasible and leads to improved medication adherence. However, the lack of group differences in other health behavior subcategories and in the

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Authors' contributions: L.H.W., L.M.Y., and S.X.C. were responsible for the study conception and design. L.H.W. and X.P.Z. participated in the training of research nurses in the intervention group. M.M.M., X.N.X., and C.L.O. were responsible for implementing the intervention. M.Z. provided statistical expertise. L.H.W. wrote the first draft of the manuscript and L.M.Y., S.X.C., and X.P.Z. revised the manuscript critically. All authors read and approved the final manuscript.

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mRS score indicates a need for more effective intervention strategies to help patients reach guideline-recommended targets. **Key Words:** Stroke—goal setting—telephone follow-up—health behaviors—secondary prevention—RCT—nursing.

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## Introduction

Stroke is the third leading cause of death worldwide,<sup>1</sup> but is the leading cause of death in China.<sup>2</sup> The death rate from stroke in China is 22.45%, 4-5 times higher than the death rate in European countries and in the United States, and 3.5 times higher than that in Japan.<sup>2</sup> Patients who have suffered a stroke are at high risk for stroke recurrence.<sup>3</sup> Recurrence risk is also higher in China; the stroke recurrence rate was 8% at 1 year in both South Carolina and South London<sup>4,5</sup> compared to 13.4%-18.4% in China.<sup>6,7</sup>

Guidelines<sup>8,9</sup> for secondary prevention of stroke have been published. Inpatient stroke education optimizes secondary prevention at the time of hospital discharge, but care may not be continued after discharge.<sup>10,11</sup> Secondary prevention of stroke in China is not satisfactory for several reasons. First, patients and physicians pay more attention to in-hospital treatment during the acute phase of stroke than to long-term prevention after hospital discharge.<sup>12</sup> Second, the separation of health systems into hospital-based and community care in China is a major barrier to optimal secondary prevention as recommendations provided in hospitals are frequently not adhered to by community physicians, a situation similar to that in Germany.<sup>3</sup> Third, in our experience, many stroke patients do not visit outpatient clinics for long-term secondary prevention programs. Moreover, a long-term secondary prevention program alone, consisting of regular follow-up visits, was not sufficient to reach guideline-recommended treatment targets in most of our ischemic stroke patients, a situation similar to that in The Netherlands.<sup>13</sup> The end result is a general lack of knowledge regarding lifestyle changes required to reduce the risk of recurrent stroke.<sup>14</sup> In fact, stroke knowledge is positively related to healthy behaviors.<sup>15-17</sup>

Previous studies have demonstrated that many stroke patients do not follow the recommended measures over the long-term<sup>3</sup> and exhibit suboptimal health behaviors, including inadequate physical activity, poor diet, alcohol consumption, and smoking.<sup>16-18</sup> Additionally, one third of stroke patients discontinue medications prescribed for secondary prevention.<sup>19</sup> Several studies have been conducted on transitional programs intended to improve secondary prevention, including telephone follow-up,<sup>20</sup> motivational interviewing,<sup>21</sup> and patient diaries.<sup>22</sup> These studies have demonstrated that improvement is possible, but results are varied. A multifaceted pharmacist intervention including motivational interviewing and 3 telephone follow-ups did not improve patient adherence to secondary stroke

prevention therapy.<sup>23</sup> Conversely, a lifestyle intervention including exercise training, salt restriction, and nutritional advice once or twice per week for 24 weeks significantly increased physical activity, decreased salt intake at 6 months, and reduced the incidence of new vascular events in patients with noncardioembolic mild ischemic stroke after a median follow-up period of 2.9 years.<sup>1</sup> Another multifactorial intervention, including 3 follow-up visits conducted during the first, third, and sixth months following discharge, designating a family member to support adherence behavior, and providing educational information to patients using motivational interviewing, was effective for improving adherence to antihypertensive medication and blood pressure (BP) control.<sup>24</sup> However, such interventions are resource intensive for both patients and staff, and not all hospitals and patients can afford them.

While previous studies have assessed health behavior modification following stroke, few randomized controlled trials (RCTs) have focused on the long-term maintenance of health behaviors. Thus, effective and feasible interventions intended to improve health behaviors following ischemic stroke are needed. One such intervention is the "Get with the Guidelines-Stroke" program of the American Heart Association/American Stroke Association used to improve the quality of postdischarge care for patients with stroke.<sup>25</sup> However, adherence to guidelines for the secondary prevention of ischemic stroke is highly variable.<sup>26</sup>

Goal setting is a process in which people set targets and work toward achieving them.<sup>27</sup> It is recognized as a potentially effective technique for assisting patients to adopt healthier behaviors.<sup>28</sup> Telephone follow-up intervention is relatively convenient and low cost, and has been found to improve health behaviors in many chronic disease patients, such as hypertensive patients for cardiovascular disease risk reduction<sup>29</sup> and diabetes patients for self-care activities including medication adherence.<sup>30</sup> The program described in the current study is a structured guideline-based, goal-setting telephone follow-up intervention designed to help patients make changes to their behaviors by setting national guidelines as final targets. The present study tested whether the program could improve health behaviors in patients with ischemic stroke.

## Methods

### *Study Design*

This is a multicenter, assessor-blinded, parallel-group RCT (1:1) to determine whether a structured

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