

A Discussion on the Construction of a Three-Tier Prevention Service System for Hospital Weight Management under the Concept of Health Ecology

Qin Yin, Lu He, Guiqiong Xie, Qian Li*

Deyang People's Hospital, Deyang 618000, Sichuan, China

**Author to whom correspondence should be addressed.*

Copyright: © 2026 Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), permitting distribution and reproduction in any medium, provided the original work is cited.

Abstract: *Objective:* To analyze the construction method and effect of a three-tiered prevention service system for hospital weight management under the concept of health ecology. *Methods:* 1500 researchers who completed this survey from January to December 2025 were selected as the observation subjects. Among them, 1000 researchers implemented primary prevention, 300 implemented secondary prevention, and 200 implemented tertiary prevention. A three-tiered prevention service system for hospital weight management under the concept of health ecology was built based on different groups, and the researchers' weight, waist circumference, etc. were evaluated before and after the implementation of the system. *Results:* The weight management awareness rate of researchers who implemented primary prevention in the long term was higher than that of researchers who implemented mid-term and short-term prevention ($p < 0.05$); the long-term obesity incidence rate of researchers who implemented secondary prevention was lower than that of researchers who implemented mid-term and short-term prevention ($p < 0.05$); the long-term BMI index of researchers who implemented tertiary prevention was lower than that of researchers who implemented mid-term and short-term prevention ($p < 0.05$). *Conclusion:* After the construction of a three-tiered prevention service system for hospital weight management under the concept of health ecology, the implementation of relevant weight prevention strategies for different groups can reduce the obesity rate and reduce the weight of obese individuals, which has application value.

Keywords: Health ecology; Three-tiered prevention service system for weight management; Implementation effect

Online publication: June 26, 2026

1. Introduction

According to the "World Obesity Map 2025", the global obese population is projected to grow from 524

million in 2010 to 1.13 billion in 2030, with an increase rate of over 115%. 41% of adults in China have a high BMI (≥ 25 kg/m²), and 9% are severely obese. Obesity is associated with patients' mental health and reduced labor capacity, and has a huge impact on the health of the population ^[1]. The "Healthy China 2030" plan clearly proposes to implement a prevention and control strategy for chronic diseases and defines the obese population as a key population for prevention and control. Health ecology focuses on the interaction between individuals, the environment, and policies, and can establish a three-level prevention system. Targeted prevention and control measures can be formulated for different target groups, laying the foundation for weight management ^[2]. Some studies have pointed out ^[3] that building a health prevention and control system centered on health can change the efficiency of traditional obesity prevention, promote the transformation and upgrading of the management model, optimize the rational allocation of health resources, and improve the health level of the masses. This study establishes a three-level prevention service system for hospital weight management under the concept of health ecology and evaluates the application value of this prevention system.

2. Materials and methods

2.1. General information

1500 researchers who completed this survey between January and December 2025 were selected as the observation subjects. Among them, 1000 researchers implemented primary prevention, 300 implemented secondary prevention, and 200 implemented tertiary prevention. Primary prevention: 531 males and 469 females, aged 18–60 years, with a mean age of (39.43 ± 4.71) years. Secondary prevention: 183 males and 117 females, aged 19–62 years, with a mean age of (39.75 ± 5.43) years. Tertiary prevention: 104 males and 86 females, aged 22–58 years, with a mean age of (37.32 ± 6.81) years.

2.2. Methods

Primary Prevention (All Population): This involves residents aged 18–60 in a pilot community, covering 1–2 communities. A pilot program of healthy canteens will be established, collaborating with catering businesses to develop low-fat, low-sugar diets, clearly defining the calorie and nutritional components of the meals. Community fitness trails will be constructed, and public facilities such as calorie consumption indicator signs will be planned. Regularly organized activities such as square dancing and Tai Chi will be implemented for community residents, each session lasting at least 15 minutes. A 10-minute healthy break time will be implemented in schools and businesses, with schools incorporating rope skipping and aerobics during breaks, and businesses implementing workplace exercise programs and providing standing desks. Community restaurants will be encouraged to develop Sichuan-style dietary guidelines, incorporating local culture into their low-oil, low-salt recipes. Partnerships with supermarkets will be established to display whole grains and low-sugar foods prominently. A 10,000-step challenge and other healthy exercise competitions will be promoted.

Secondary prevention (high-risk obesity): Implement risk screening and stratified management, using a rapid obesity risk assessment scale to evaluate researchers' BMI, waist circumference, etc. For low-risk researchers, weight management information is sent via WeChat; those at medium to high risk have two risk factors and are included in a key intervention list, receiving visits and guidance from family doctors. Meal plans are developed based on individual needs, requiring researchers to track their progress daily. A tiered exercise plan is developed, combining aerobic and resistance training, implementing a family and

community-based collaborative model. Those who achieve their weight loss and dietary/exercise goals receive free health checkups as a reward.

Tertiary prevention (obese patients): Implement multidisciplinary collaborative intervention, assess the researcher's degree of obesity, and combine it with nutritional intervention (develop a progressive calorie diet, weekly online food check-in, and nutritionist feedback), exercise intervention (individualized exercise, such as water tai chi, low-impact aerobics, and gym supervision), behavioral intervention (behavioral therapy to alleviate the patient's emotional burden, with family participation and supervision to ensure the patient eats healthily), drug treatment (patients use semaglutide and orlistat, and monitor for side effects such as gastrointestinal reactions and liver and kidney function), and surgical treatment (develop a surgical weight loss procedure, a progressive diet and exercise plan, and regular follow-up).

Establish a cyclical management process of 1–12 months, with short-term being 1–3 months, medium-term 3–6 months, and long-term 6–12 months.

2.3. Observation indicators

- (1) Statistical analysis of weight management awareness among primary prevention researchers was conducted anonymously, including comprehensive awareness, general awareness, and insufficient awareness, with short-term, medium-term, and long-term assessments.
- (2) Statistically assess the incidence of obesity among secondary prevention researchers, $\geq 28\text{kg/m}^2$, and evaluate in the short, medium and long term.
- (3) Statistically analyze the short-term, medium-term, and long-term BMI indices of researchers in the three-level prevention study.

2.4. Statistical analysis

The study used SPSS 23.0 software to process the data. The standard deviation of continuous data was mean $\pm$ standard deviation (SD) expressed as $\bar{x} \pm s$, and the differences between groups were analyzed by *t*-test. The categorical data were expressed as *n* and % and analyzed by chi-square test. $P < 0.05$ was considered statistically significant.

3. Results

3.1. Awareness rate of weight management among primary prevention researchers

The weight management awareness rate among long-term primary prevention researchers was higher than that among mid-term and short-term researchers ($p < 0.05$), as shown in **Table 1**.

Table 1. Awareness rate of weight management among primary prevention researchers (n, %)

Stage	Number of examples	Comprehensive understanding	General understanding	insufficient understanding	Cognition rate
short term	1000	143	412	445	555 (55.50)
Mid-term	1000	254	531	215	785 (78.50)
long	1000	431	475	94	906 (90.60)
F					29.534
P					0.001

3.2. Obesity incidence among secondary prevention researchers

The incidence of long-term obesity was lower in secondary prevention researchers than in medium- and short-term researchers ($p < 0.05$), as shown in **Table 2**.

Table 2. Prevalence of obesity (n, %) among secondary prevention researchers

Stage	Number of examples	Incidence
short term	300	53 (17.67)
Mid-term	300	42 (14.00)
long	300	21 (7.00)
F		16.458
p		0.001

3.3. Short-term, medium-term, and long-term BMI indices of researchers in tertiary prevention

The long-term BMI index of the tertiary prevention researchers was lower than that of the medium- and short-term researchers ($p < 0.05$), as shown in **Table 3**.

Table 3. Short-term, medium-term, and long-term BMI indices (mean $\pm$ SD, kg/m²) of researchers in tertiary prevention studies.

Stage	Number of examples	BMI Index
Short term	200	33.12 $\pm$ 2.03
Mid-term	200	32.68 $\pm$ 3.84
long	200	29.54 $\pm$ 1.73
<i>t</i>		7.012
<i>p</i>		0.001

4. Discussion

Health ecology views health issues from the perspective of the overall health system, emphasizing the relationship between human health and the natural and social environment. It is not limited to physiological and behavioral factors, but also considers the natural environment in a comprehensive manner, providing ideas for the comprehensive improvement of obesity. Hospitals are medical service institutions and play a key role in weight management. With their professional teams, advanced equipment and rich experience, hospitals provide precise diagnosis and treatment services. In regional obesity epidemic surveys, high-risk obesity groups and obese groups in the region can be identified, and primary prevention can be provided to the general population that has not yet become obese, mainly through the dissemination of dietary knowledge, changes in dietary habits and exercise guidance. Secondary prevention is implemented for high-risk obesity groups; health knowledge is pushed to such groups, medium- and high-risk patients are included in the key list, and family doctor teams visit them ^[4]. Individualized dietary intervention is implemented for them, a three-meal check-in mechanism is established, and low-salt and low-fat diets are adopted. Exercise intervention is to test the physical fitness of researchers, establish exercise mutual aid groups, and organize members to train in their spare time ^[5]. The three-level prevention is based on the obese population, implementing medical assessment, nutritional assessment, psychological and social assessment, and various

methods such as lifestyle intervention, dietary management, and weight loss treatment to achieve weight loss and prevent obesity complications. For example, for patients with a BMI of 35 kg/m² and one chronic disease, other therapies are not significant, and surgical intervention is implemented. Surgery can reduce weight to a certain extent, but the risk of postoperative complications is high. It is necessary to master the patient's indications, follow up closely, and rehabilitate after surgery. The three-level prevention system has established a complete system, using various methods such as obesity prevention and overweight management. Through long-term follow-up, the BMI index is reduced, and the effect is significantly better than that of short-term patients^[6]. The obesity incidence rate of secondary prevention researchers is low, while the obesity awareness rate of primary prevention researchers is high, indicating that the three-level prevention system is comprehensive, enabling the public to participate in community weight management projects and activities, and enhancing their awareness and understanding of weight management knowledge. For high-risk obese and already obese groups, a health management model is implemented, starting from multiple perspectives such as dietary health, exercise health, and medical health to improve the weight management effect.

Funding

Sichuan Provincial Research Center for Primary Healthcare Development, “Construction of a Three-Tier Prevention System for Weight Management in Primary Healthcare Institutions from the Perspective of Health Ecology – A Case Study of Deyang City” (Project No.: SWFZ25-Y-48)

Disclosure statement

The author declares no conflict of interest.

References

- [1] Yang W, Ge SS, Li N, 2026, Personalized Weight Management for High-Risk GDM Populations Based on IMCHB: A Mixed-Methods Randomized Controlled Trial. *Chinese Journal of Family Planning*, 34(2): 294–298.
- [2] Li K, Qi DJ, 2016, Discussion on Weight Management of Overweight and Obese People in the Community by General Practitioners. *Chinese Modern Doctor*, 54(1): 119–121.
- [3] Ke XT, Zhang LL, 2025, Obesity and Breast Cancer: Current Status, Challenges and New Prospects of Precision Intervention in Weight Management. *Guangdong Medical Journal*, 46(12): 1772–1776.
- [4] Zhou SD, Zhang Y, Wu XL, 2025, Application Value of Prenatal Nutrition Health Education Combined with Weight Management in Obese Pregnant Women. *Integrated Traditional Chinese and Western Medicine Nursing*, 11(8): 93–96.
- [5] Zeng HJ, Hu XL, Chen B, et al., 2017, Observation on the Effect of Weight Management in Obese Adult Patients with Primary Hypertension. *General Nursing*, 15(14): 1738–1740.
- [6] Lyu T, Wang XY, Li XX, et al., 2026, Summary of the Best Evidence for Nonpharmacological Weight Management in Overweight or Obese Patients with Type 2 Diabetes. *Nursing Research*, 40(1): 108–114.

Publisher's note

Bio-Byword Scientific Publishing remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.