

Executive Summary

medical cost estimation of frailty and cost-effectiveness of comprehensive integrated frailty management in primary care

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□ Introduction

The World Health Organization (WHO) recently endorsed the proposal for a Decade of Healthy Ageing (2020–2030). The WHO defines “healthy aging” as “the process of developing and maintaining the functional ability that enables wellbeing in older age.” Among the strategies for the Decade of Healthy Ageing, the WHO has suggested enhancing intrinsic capacity, promoting functional ability, and implementing the Integrated Care for Older People (ICOPE) package. The WHO has defined steps for ICOPE evaluation and

scale-up and is performing a prospective study in 2-3 countries (low and middle income, high income) to test its feasibility in 2021-2022 and a multinational randomized study to validate its clinical efficacy and effectiveness in 2022-2024. Intrinsic capacity and frailty represent two faces of the same coin, with one indicating the reserves of the individual and the other indicating the deficits that accumulate with age.

First, the purpose of this study is to improve the frailty status, gait ability, social involvement activity, acute medical visit and healthy habits of patients through comprehensive integrated frailty management in primary care by applying the screening test and diagnosis. Second, it is to calculate the economic burden of disease of the subjects of the KFACS cohort through the calculation of medical usage behavior and medical expenses.

□ Methods

○ Comprehensive integrated frailty management in primary care

This study was conducted in six primary care clinics. Nurses and doctors at the clinics apply the Korean Frailty Index for Primary Care (KFI_PC) to evaluate the functional decline and frailty of older adult patients visiting the clinics.

The KFI_PC consists of 54 items in the following 10 domains: (1) cognitive status, including delirium or dementia; (2) mood; (3) communication, including vision, hearing, and speech; (4) mobility; (5) balance; (6) bowel function; (7) bladder function; (8) ability to perform activities of daily living; (9) nutrition; and (10) social resources. All items in the KFI_PC are already embedded in and displayed on a mobile notepad so that the nurses and doctors can easily evaluate the patient, determine the frailty index score, and assess risk factors for frailty, which are automatically displayed on the notepad. In the ICOOP_Frail study, patients with KFI_PC scores ≥ 0.25 , which is defined as frail, are

randomized into experimental or control groups.

In the experimental group, primary care physicians explain functional declines or risk factors and educate patients about nutrition or exercise, adjust medication, and manage diseases based on the recommendations automatically displayed for the patient. Within 1 month, a health coach contacts the patient via telephone to monitor the patient and encourage their consumption of a protein-rich balanced diet or/and practicing exercise, as well as connects the patient to community resources for social support, if needed. The phone call for health coaching is repeated monthly for a total of 6 months. The KFI_PC is re-evaluated after 3 and 6 months. The primary outcome variables were defined as frailty index and the number of acute medical visits, while activities of daily living, health habits (exercise, diet), social activities, and gait ability were defined as the secondary outcomes.

○ Calculation of medical expenses and disease burden for KFACS cohort subjects

The KFACS cohort subjects' medical use behavior and medical cost calculations were performed by classifying frailty scores (1-5 points), comorbid diseases(e.g., hypertension, diabetes, musculoskeletal disorders), and changes in frailty status to calculate medical usage behaviors and medical expenses. A regression analysis was performed. And the economic burden of disease was measured as the sum of direct and indirect costs.

□ Results

○ Comprehensive integrated frailty management in primary care

In KFI_PC, the score decreased by 0.01 in the experimental group compared to the control group, and in the case of time, the score decreased by 0.01 after 3 months and 0.03 after 6 months compared to the baseline. In addition, through the interaction between time and

groups, the score of the experimental group decreased more by 0.03 compared to the control group after 3 months than the difference between the experimental group at baseline compared to the control group ($p<0.05$).

The score of KFI_PC_re decreased by 0.005 in the experimental group compared to the control group, and in the case of time, the score decreased by 0.02 after 3 months and 0.05 after 6 months compared to the baseline, which was statistically significant ($p<0.05$). As a result of confirming through the time and group interaction of model 3, the score of the test group decreased by 0.05 more than the control group after 3 months compared to the control group at baseline, which was statistically significant ($p<0.05$).

○ Calculation of medical expenses and disease burden for KFACS cohort subjects

Outpatient medical expenses were 270,000 won more in the frail group than in the robust group, and the combined inpatient and outpatient medical expenses were 1.45 million won higher in the frail group than in the robust group. ($p<0.05$). As a result of converting direct costs per person in 2018, the robust group was 3.9 million won, the pre-frail group was 5.2 million won, and the frail group was 6.5 million won. In terms of gender, men were higher than women, and by age, frail men aged 75-79 years had the highest direct cost of KRW 11.4 million per person.

Key words

: Frailty, Healthy aging, Frailty index, Integrated care program, Primary care, KFACS