Developing an Integrated Health Care Model for Older People with Multimorbid Chronic Conditions

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▢ Introduction

Among people aged 65 years or older, 54.9% have multiple chronic conditions. Multimorbidity includes chronic conditions affecting cardiovascular, endocrine, musculoskeletal, and gastrointestinal systems, such as hypertension, type 2 diabetes, hyperlipidemia, arthritis, back pain/sciatica, osteoporosis, cataracts, gastro-duodenal ulcers, angina/myocardial infarction, and stroke. Multimorbidity increases the risk of frailty, contributing to disability onset. Although multimorbidity directly influences disability, it also indirectly increases the risk of disability through the pathway of frailty. Because multimorbidity and frailty are closely related, managing both conditions is critical in preventing disability. With the rapid increase in the aging of the population, there has been an increasing need for developing policies for the management of multimorbid conditions and frailty in older people.

The study's aim is to propose research and policy directions for establishing an integrated healthcare system for managing older people with multimorbidity. Specific aims include (1) identifying risk factors of and

effective interventions for multimorbid chronic conditions, (2) examining current multimorbidity profiles of older people, (3) reviewing national policies and management strategies for multimorbidity, (4) prioritizing action plans for developing model policies and programs for the management of frailty, and (5) generating a research and policy roadmap for developing an integrated care model for people with multimorbid conditions.

▢ Methods

I. Literature review

A rapid systematic review of risk factors and interventions for multimorbidity was conducted. Systematic review articles were searched and examined to identify the current evidence base and to develop future research agenda on multimorbidity in older people.

II. Analysis of the current status of multimorbidity in older adults

The National Health Insurance Service Senior (NHIS-Senior) claim database (2002-2013) was used in the analysis. Multimorbidity was defined as having three or more chronic conditions, with one inpatient day or three or more outpatient days. Multimorbidity status was analyzed by gender, age, and insurance types. Use of health care was analyzed by outpatient, inpatient, and length of stay. Cluster analysis was performed, taking into account visits/admissions and healthcare costs by outpatient and inpatient service use. The risk of disability and mortality of those with multimorbidity was also analyzed.

III. Analysis of policy and programs

Major programs addressing chronic disease management were reviewed, and opinions of experts were collected to identify the current approaches, limitations, and implications in managing multimorbidity of older adults. The policy frameworks and plans of major countries in addressing multimorbidity were also analyzed. Expert opinions were obtained by a self-administered survey using the SELFIE framework on multimorbidity.

IV. Analysis of policies and programs of frailty management

A literature review of risk factors, diagnostic tools, interventions, and

prognosis of frailty was conducted. In addition, studies, demonstrations projects, programs, and clinical practice guidelines regarding frailty management were analyzed. Based on the World Health Organization's ICOPE framework, a Delphi survey of experts was administered to identify the current situation of frailty management and produce policy recommendations.

V. Development of a roadmap for integrated care of multimorbidity

Based on the current evidence on multimorbidity programs and policies, a research and policy roadmap for managing people with multimorbid chronic conditions was developed. Plans of action were grouped according to the SELFIE framework. Recommendations for demonstration programs and an agenda for research were proposed.

▢ Current evidence and status of multimorbidity

I. Systematic review of evidence

A rapid review of the current systematic reviews on multimorbidity resulted in 5 articles on risk factors and 7 on interventions. Risk factors included education, income, physical frailty, and social frailty. Among the intervention studies, case management by nurses reduced readmission rates significantly. Patient workshop and coaching, cognitive behavioral therapy, education of personnel, organized intervention, and common goal setting by specialists and patients demonstrated positive effects. Care management and self-care support were commonly implemented, with multicomponent interventions exhibiting positive changes for depression, medication adherence, and health behaviors. However, an insufficient number of studies and heterogeneity among the reported studies limited the synthesis of the evidence.

II. Current status of multimorbidity

Among the 470,904 aged 65 years or older in the NHIS-Senior database in 2007, there were 20.2% with three or more chronic conditions. Those with multimorbid conditions tended to be women and insured by Medical Aid. The proportion of multimorbidity tended to be the lowest among those in their 60's but highest in their 70's. Chronic conditions commonly observed

in the multimorbid group included hypertension, vision loss, chronic back pain, and knee osteoarthritis. People with three or more chronic conditions, compared with those having one or two chronic conditions, had higher healthcare costs and longer admission days. In addition, those in the higher class membership defined by the cluster analysis demonstrated higher disease severity. Multimorbidity was associated with an increased risk of disability and mortality.

▢ Programs and policies for managing multimorbidity

Although many chronic disease management programs exist, they vary in organization, support, and implementation that limit their effective operation. In addition, there is a lack of an integrated care model for multimorbid patients, where the current focus is on treatment rather than prevention, with insufficient support to ensure delivery of quality care. Developing eligibility criteria and expanding coverage of chronic conditions, training and recruiting clinical specialists (e.g., nutritionists, social workers), establishing an electronic health information system for data linkages, and collaboration with community resources (e.g., public health centers) and primary care are warranted.

Programs and policies in other countries indicate the need to develop models that can incorporate the distinctive characteristics of multimorbidity and address the diverse needs of multimorbid patients. An integrated model for managing multimorbidity should be effective and efficient in delivering quality services to multimorbid individuals. In addition, it should identify key problems and issues facing multimorbid management and provide effective strategies and recommendations.

▢ Research and policy directions for the management of frailty

I. Research in frailty

A literature search on frailty in Korea was conducted, resulting in 45 articles. These included studies on the risk factors and outcomes of frailty and the effectiveness of interventions. Frailty was associated with female gender, being older, chronic diseases, falls, low physical activity, healthcare use, depression, and cognitive decline. Frailty significantly increased mortality risk, and lowered quality of life and increased functional disability.

Interventions to prevent frailty included programs on physical exercise, multicomponent interventions, and fall prevention, demonstrating effects on physical capacity and health status.

The present frailty interventions report results that demonstrate improvement in individual health dimensions, such as physical capacity, health status, mental and cognitive status, rather than frailty as a whole. The current evidence on the effects of frailty prevention is still limited. It is necessary to build the evidence base by funding cohort studies, clinical intervention studies, and community intervention studies to contribute to policymaking.

II. Analysis of policy and programs on frailty

The World Health Organization (WHO) has put forward the strategic action plan, Decade of Healthy Ageing 2020-2030, that proposes establishing an international partnership and building evidence for achieving healthy aging by maximizing functional ability. The ICOPE has been developed as a model to disseminate integrated care models at the system and service levels.

Based on the WHO-ICOPE framework, an expert Delphi has reported the service dimension being more firmly established than the system dimension. At the service dimension, "actively seek and identify older people in need of care in the community" and "deliver care through a community-based workforce, supported by community-based services" items received a high level of consensus.

III. Policy directions for integrated care of frailty

Early identification of frailty in community-dwelling older adults helps prevent functional decline and maintain independent living. As seen in the United Kingdom, frailty, as with multimorbidity, in late-life needs to be designed as part of the national plan. The government should recognize the need to construct an integrated care system for older people with frailty and multimorbidity. Funding research and development in frailty is essential.

▢ Conclusions and policy agenda

I. Roadmap for integrated care of multimorbidity

The aim of the roadmap is (1) to improve health outcomes of the

individual and population, (2) to enhance patient-centeredness and patient experience, and (3) to maintain a structure of sustainable health care financing. Strategic action plans based on the SELFIE framework include (1) 6 components of the healthcare system (service delivery, leadership and governance, workforce, financing, technologies and medical products, information and research), and (2) clinical/organizational/policy settings.

II. Demonstration programs and research proposal

Development and testing of the integrated care model require demonstration projects. A family physician for people eligible for long-term care, a center for medical house calls, a geriatric clinic for acute care hospitals, and a family geriatrician for multimorbid, frail older adults are proposed.

Future research agenda might include:

1) Service delivery
   - Developing self-care manuals and coaching contents for multimorbid patients
   - Developing clinical practice guidelines for multimorbidity
   - Developing quality of care indicators for multimorbidity
2) Leadership & governance
   - Developing care management guidelines for multimorbidity
   - Improving organizational culture in the delivery of integrated care
   - Restructuring community-based integrated care system
3) Workforce
   - Establishing the role of care coordinators in integrated care coordination models
   - Reducing the burden of informal caregivers
   - Developing educational programs for caregiving for the future
4) Financing
   - Developing incentives for providers of integrated care
   - Developing incentives for users of integrated care
   - Developing population-based risk stratification methods
5) Technologies & medical products
   - Incorporating ICTs in integrated care
   - Evaluating the utility of telemedicine in geriatric care

- Developing technologies for sharing patient information among providers

6) Information & research
   - Enacting laws and regulations for sharing patient information among providers
   - Evaluating the effectiveness and cost-effectiveness of multimorbidity intervention programs
   - Setting up centers for primary care and physician house calls for providing integrated care to older patients with multimorbidity

Key words:

: older adults, multimorbidity, chronic diseases, frailty, integrated care, health care system, roadmap, policy