

National Screening Program for Transitional Ages in Korea: A New Screening for Strengthening Primary Prevention and Follow-up Care

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Screening can effectively reduce mortality and morbidity in some diseases. In Korea, a practical national screening program for chronic disease was launched in 1995 and several problems were discussed. The program focused primarily on disease detection without follow-up care. In addition, the test items were uniform regardless of subject's age, sex, or risk factors; and people with low socioeconomic status were excluded. To improve the quality of program, a new national screening program called the "National Screening Program for Transitional Ages (NSPTA)" was initiated in 2007. It targeted two age groups, ages 40 and 66, because these ages are important transition periods in one's lifecycle. Follow-up care and education for lifestyle modification has been intensified; screening tests for mental health problems and osteoporosis have been introduced. The pool of eligible participants has been expanded to include people supported by Medicaid. This review aimed to describe the contents, process, and characteristics of the NSPTA and to compare it with the previous program. In addition, some preliminary results from 2007 to 2009 were presented. Lastly, we suggest several points that need to be considered to improve the program such as enhancement of participation rates, necessity of specialized committee and research for current screening program to be supported by evidence.

Key Words: Mass Screening; Transitional Age; National Health Screening; Korea; Follow-up; Primary Prevention; Secondary Prevention; Health Risk Appraisal; Lifestyle

INTRODUCTION

Screening can be defined as the systematic application of a test or inquiry to identify those individuals at sufficient risk of a specific disorder who will benefit from further investigation or direct preventive action, among persons who have not sought medical attention on account of the symptoms of that disorder (1). Screening is generally considered as secondary prevention among the 3 levels of disease prevention (2). Screening is an important component of health promotion programs with the progress of diagnostic technology for early detection. It has the potential to produce benefits in preventing morbidity and mortality if the screening program fulfills certain conditions (3). It should be an important health problem. The epidemiology and natural history, including development from latent to declared disease, should be adequately understood; and there should be a detectable risk factor, disease marker, latent period, or early symptomatic stage. All cost-effective primary prevention interventions should have been implemented as far as practicable. If the carriers of a mutation are identified as a result of screening, the natural history of people with this status should be understood, in-

cluding the psychological implications. Therefore, many countries have developed a variety of screening programs as part of their preventive health services according to the recommendations of specialized committees (4-6).

The first nationwide health screening program of Korea started in 1980. It was limited to participants who worked at schools or in the government. This program has rapidly expanded its target population and disease screened. In 1995, the Ministry of Health and Welfare took charge of this program and an extensive national health screening program for some chronic diseases, called the General Health Screening Program (GHSP), was launched. It was available to local and corporate subscribers of National Health Insurance (NHI), but excluded individuals supported by Medicaid (7, 8). In the meantime, the first National Cancer Screening Program (NCSP) was provided to people supported by Medicaid in 1999. Gradually, it expanded participant pool as well as types of cancer screened (9). Therefore, the National Health Screening Program (NHSP), which consists of both the GHSP and the NCSP, is available to most Koreans at least every other year.

Although such rapid progress is an exceptional achievement,

compared to other countries, several problems of the GHSP have been discussed (7, 8). First, GHSP is not effective in reduction and prevention of the target chronic diseases, because it focuses primarily on the detection of disease and does not provide effective follow-up care and lifestyle modification, for those found or suspected to have the disease. Second, enough attention has not been paid in the selection of screening test items to factors such as disease prevalence based on age and sex, or changes in the disease pattern with time. Third, with regard to health inequality, this program is available only for people subscribed to NHI, because the GHSP is funded by the NHI. People who are supported by Medicaid (approximately 3% of Koreans) cannot participate in this program, even though they may be exposed to more risk factors and could be more vulnerable to chronic diseases due to low socioeconomic status (10, 11).

To address these limitations of the existing GHSP, a new National Screening Program for Transitional Ages (NSPTA) was launched in 2007 (12). The program focused on two age groups, ages 40 and 66, because these ages are believed to be important transition times in terms of health in one's lifecycle. Age 40 is regarded as a time of transition to middle age, and the incidence of many chronic diseases begins to increase during this transition (13, 14). In addition, age 65 is regarded as a time of transition to old age, when a geriatric approach becomes necessary for comprehensive health promotion (15, 16). This review aims to describe the characteristics of the NSPTA compared to those of the GHSP at the time when the NSPTA started, and presents some preliminary results of the NSPTA from 2007 to 2009.

CONTENTS AND PROCESS

The overall process of the NSPTA is summarized and compared with that of the GHSP in Fig. 1. Table 1 demonstrates the com-

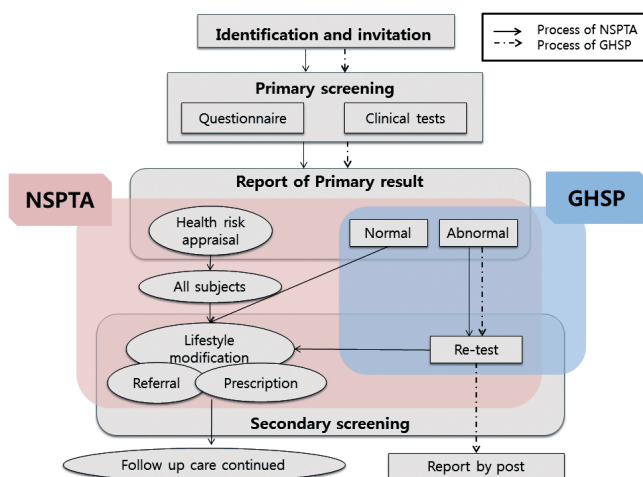


Fig. 1. Overall process of the NSPTA. *National Screening Program for Transition Ages; †General Health Screening Program.

parison of test items in the GHSP and the NSPTA in 2007.

Identification and invitation of eligible subjects

Subjects who reach the ages of 40 and 66 are identified as being eligible for NSPTA and receive an invitation from the National Health Insurance Corporation (NHIC), which has the information of individuals insured with NHI as well as Medicaid. The NHIC and public health centers encourage these targeted individuals to participate in the screening program by campaigning or mail. Clinics, hospitals, and public health centers voluntarily apply to be certified as institutions for the national screening program. They are permitted if their equipment, manpower, and facilities satisfy the required criteria. Targeted individuals are free to choose any certified NSPTA institution.

Primary screening in the NSPTA

The operating system of the NSPTA is divided into a 2-step procedure that includes primary and secondary screening. In primary screening, all participants are screened using clinical tests including blood tests, urinalysis, radiological examination, and physical measurement, and are asked to fill out a questionnaire. Clinical tests are performed to screen for metabolic syndromes (obesity, hypertension, diabetes mellitus, and dyslipidemia),

Table 1. Comparison of tests between the General Health Screening Program (GHSP) and National Screening Program for Transitional Ages (NSPTA) in 2007*

Types and items of screening	GHSP	NSPTA	
		Aged 40	Aged 66
Primary screening			
Questionnaire			
Brief lifestyle and medical history	0	0	0
Depression [†]	-	0	0
Cognitive impairment [‡]	-	-	0
Fall and urinary dysfunction [§]	-	-	0
Clinical tests			
Metabolic syndrome	0	0	0
Osteoporosis	-	-	0
Others [¶]	0	0	0
Secondary screening			
Questionnaire			
Detailed lifestyle ^{**}	-	0	0
Depression ^{††}	-	0	0
Cognitive impairment ^{‡‡}	-	-	0
Clinical tests			
Hypertension	0	0	0
Diabetes mellitus	0	0	0

*We compared these programs at the time when the NSPTA was started; †4 selected questions from the Center for Epidemiologic Studies Depression (CES-D) scale and 3 selected questions from the Geriatric Dementia Scale (GDS) were used for participants aged 40 and 66, respectively; ‡Korean Dementia Screening Questionnaire-P was used; §The participants were asked if they experienced a fall or urinary hesitancy during the past 6 months; ||Includes hypertension, diabetes mellitus, dyslipidemia, and obesity; ¶Anemia, kidney disease, liver disease, and pulmonary disease. Antigen and antibody for hepatitis B virus are tested for people aged 40 years in NSPTA; **Lifestyle modification program provides general practitioners with evidence-based tools and skills to help patients address the main lifestyle risk factors for chronic disease; ††The CES-D scale and the short form of GDS were used among participants aged 40 and 66, respectively; †‡Dementia Screening Questionnaire-Cognition was used.

diseases of the liver, kidneys, or lungs, and problems in vision and hearing, at both ages. Most of these tests are targeted towards the prevention of cerebrovascular and cardiovascular diseases. In addition, in consideration of the intermediate prevalence of chronic hepatitis B virus infection in Korea (17), antigen and antibody tests for hepatitis B virus are included for people aged 40 yr. Women aged 66 yr, are screened using bone measurement tests (including any of the following methods: dual energy X-ray absorptiometry [DEXA], peripheral DEXA [PDEXA], ultrasound, and computed tomography) to evaluate the risk of osteoporotic fracture. Besides, physical examinations such as the “timed up and go test” and the “balance test” are carried out to evaluate the risk of falling (18).

In addition to the above clinical tests, the questionnaire includes questions designed to screen for mental health conditions as well as for geriatric physical function. Information regarding personal and family medical history and brief lifestyle is also requested. To screen for depression, 4 selected questions from the Center for Epidemiologic Studies Depression (CES-D) scale, and 3 selected questions from the Geriatric Depression Scale (GDS) are included in the questionnaires for individuals of ages 40 and 66, respectively (19, 20). To evaluate geriatric physical function, a questionnaire that combines 4 items from the Korean Activity of Daily Living (K-ADL) and 2 items from the Korean Instrumental ADL (K-IADL) scales is provided to individuals aged 66 (21). Cognitive function is assessed for people aged 66 yr using the Korean Dementia Screening Questionnaire-P (KDSQ-P) (21, 22).

Report of primary screening results and health risk appraisal

After primary screening, the result of test is reported to the participants within 15 days. It contains the results of the clinical tests as well as an assessment of the responses to the questionnaire. If a person is suspected to have hypertension or diabetes mellitus in the primary screening, he or she will be re-tested to confirm the disease during the secondary screening. A health risk appraisal (HRA), which integrates the results of the clinical tests and the responses to the questionnaire, is provided to the participants to motivate behavior change. The HRA consists of 3 steps: “check likelihood of disease development,” “identify health risk factors,” and “control risk factors.” In the first step outlined in the HRA, the likelihood of developing diseases such as stroke, cardiovascular disease, and cancer is displayed as 3 categories: low, intermediate, and high. In the second step, the current status of the participant’s risk factors is presented as safe, borderline, or danger. Lastly, steps that can be taken to control the risk factors are recommended by presenting the attributable risk of each risk factor.

Secondary screening and follow-up care

All participants who undergo primary screening are invited to

secondary screening regardless of the results of primary screening. All primary clinics, including those not certified as institutions for the national screening program, are permitted to perform secondary screening. A physician counsels participants based on the overall results of the primary screening. If the re-test results in a diagnosis of hypertension or diabetes mellitus, the physician provides appropriate care including prescription and follow-up. Individuals who are believed to have mental health problems such as depression or cognitive impairment based on primary screening are evaluated using a more detailed questionnaire during secondary screening. To rule out depression, the CES-D and short form of the GDS (15 questions) questionnaires are applied to people of ages 40 and 66, respectively. To rule out cognitive impairment, the Korean Dementia Screening Questionnaire - Cognition (KDSQ-C) is applied to individuals aged 66 yr. If the result indicates that the participants may have severe mental health problems, they are referred to a specialist for an in-depth evaluation and additional care. If not, they can be managed by the primary physician.

Participants who maintain unhealthy lifestyle are re-evaluated by using a “Lifestyle modification program”. It is a service that is already operated in Australia called “Lifescrpts” (23). The Lifescrpts provides general practice with evidence-based tools and skills to help patients address the main lifestyle risk factors for chronic disease: smoking, poor nutrition, alcohol misuse, physical inactivity, and unhealthy weight. It assists with the provision of tailored advice to patients on modifying their lifestyle. In consideration of individual behavioral characteristics, the physician discusses lifestyle choices in terms of risk factors with the patients and gives advice in the form of a written script and associated patient education. Although the secondary screening of NSPTA is complete at this point, follow-up care for controlling risk factors is continued at a primary care clinic.

CHARACTERISTICS OF THE NATIONAL SCREENING PROGRAM FOR TRANSITIONAL AGES (NSPTA) COMPARED TO THE GENERAL HEALTH SCREENING PROGRAM (GHSP)

Though the contents and process of the NSPTA are similar to those of the GHSP, there are some distinctive features in the NSPTA. The first distinctive characteristic of the NSPTA is that secondary screening is routine, and now involves follow-up care. In GHSP, only patients who were suspected of having a disease could participate in secondary screening just to confirm the presence of the suspected disease, and received the screening results by mail. However, in the NSPTA, all subjects are eligible for secondary screening regardless of the results of the primary screening. Moreover, secondary screening can be performed at any primary clinic regardless of certification, to allow more individuals to participate in this program and to encourage follow-

up care. The second characteristic is that primary prevention methods, such as lifestyle modification, are emphasized. Generally, health screening focuses on secondary screening and early detection of the disease. In contrast, the NSPTA uses the HRA and lifestyle modification program to promote healthy lifestyle and to target primary prevention. We anticipate that this change improves the effectiveness of the program in preventing and controlling the targeted chronic diseases. The third characteristic of the NSPTA is that it includes tests based on changes in the prevalence and severity of diseases according to the age or sex of the subjects. Korea is one of the most rapidly aging countries (24), and suicide is the 4th main cause of death in 2010 (25). To address the problems of the aging population and increase in the suicide rate, screening for depression, cognitive impairment, osteoporosis etc. were added. This indicates that in addition to organic diseases, functional or mental problems are also increasingly being considered as important problems.

The last change is the expansion of the pool of eligible participants to include individuals who receive Medicaid assistance from the government. These individuals can now participate in the NHSP on a par with NHI insured individuals, at least at the ages of 40 and 66. With the rapid economic development in Korea, inequality is becoming the major issue in healthcare as well as in other societal problems (26). Screening is a potentially effective method to decrease health inequality (27), and the NSPTA could be a starting point for the promotion of health among the vulnerable population.

RESULTS OF THE NSPTA IN 2007-2009

The participation rates in the primary screening of the NSPTA has gradually increased over the years, reaching as much as 55.5% in 2009, lower than that of the GHSP (66.0%) but higher than that of the National Cancer Screening Program (45.3%). Higher participation rates were observed in groups with NHI and those aged 66 yr, than in groups with Medicaid and those aged 40, respectively (Fig. 2). However, only one-third of the participants from the primary screening attended secondary screening for follow-up care in 2009 (28).

Some nationally representative epidemiological data was also obtained from the results of the NSPTA in 2009. For example, the prevalence of probable depression was 8.7% for people aged 40 yr and 4.5% for people aged 66 yr, as defined by a cutoff point of 25 on the CES-D and 12 on the short form of the GDS, respectively. The prevalence of probable cognitive dysfunction was 27.2% for people aged 66, as defined by a cutoff point of 6 on the KDSQ-C. The prevalence of osteoporosis among women aged 66 was 45.2%.

DISCUSSION

Although it is too early to fully evaluate the effectiveness of the

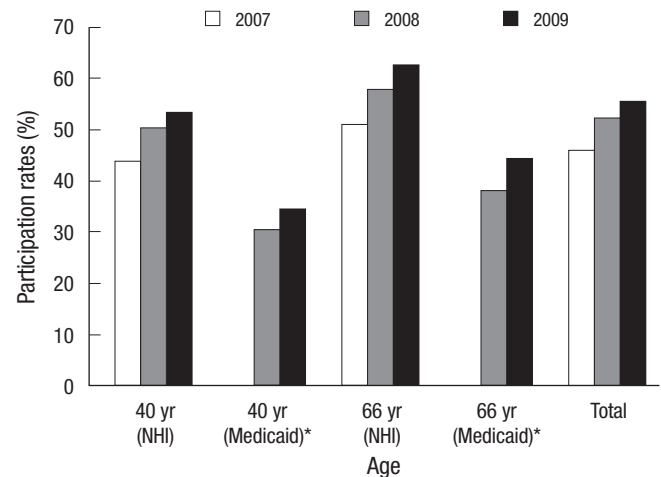


Fig. 2. Participation rates in the NSPTA from 2007 to 2009, stratified according to age and insurance. *Practically, people supported by Medicaid participated in NSPTA from 2008.

NSPTA, there are positive signs that the NSPTA has been launched successfully in some aspects. According to the evaluation by NHIC of the 2007 NSPTA, 69.8% of participants responded that they were satisfied with this program and 65% answered that the NSPTA is better than the GHSP (29). In addition, a report from the NHIC shows that a greater proportion of people who participated in both primary and secondary screening altered their lifestyle than among those who participated in primary screening alone (41% vs 29%) (30). Besides, nationwide epidemiological data of conditions such as depression and cognitive impairment, which were little known, are being reported despite the short duration of operation. These data will be useful to establish health policy for those conditions in the near future.

However, there are several points required to improve the program to achieve the intended goal. Firstly, more people should participate in the NSPTA, especially in secondary screening. Because follow-up care is a key to controlling chronic disease, some effective measures should be considered. For example, incentives can be contemplated for people who participate in secondary screening and for primary physicians who provide appropriate follow-up care, considering that only one-third of the participants from the primary screening attended the secondary screening. Secondly, although the NSPTA was provided free of cost to people with Medicaid, they participated less than did those with NHI. According to a preliminary study regarding participation in health screening, people with Medicaid have barriers other than payment that prevent them from participating in screening (31). It is necessary to identify and break down these barriers to enhance the participation rates of those with Medicaid. Thirdly, it is necessary to reconsider whether the items included in the screening tests of the NHSP, consisting of the GHSP and NSPTA, satisfied the requirements of screening principles (32). A specialized committee could be established to con-

duct scientific evidence reviews of a broad range of clinical preventive healthcare services (such as screening) and to develop recommendations for primary care clinicians and the health system. Finally, to our knowledge, the NSPTA represents the first attempt to conduct mass screening for depression, cognitive impairment, or osteoporosis. There is no clear evidence as to whether population-based screening for those diseases have a benefit or not, but the prevalence data from the short duration of the NSPTA shows that such diseases are more widespread than we had assumed. More studies of the epidemiology of chronic diseases and the cost-effectiveness of this program need to be conducted by analyzing NSPTA data.

In this article, we have overviewed the NSPTA in Korea, focusing on the differences between the NSPTA and GHSP. Although we have reviewed the differences between these programs, some of these programs have been altered for the better. For the most part, the contents of the GHSP have been made similar to that of the NSPTA, and these 2 programs, which have previously been conducted separately, have been integrated since 2009. Furthermore, all individuals with Medicaid will benefit from the GHSP from 2012, because the government plans to expand the eligibility criteria of the GHSP to include individuals with Medicaid. We hope that this program would contribute to the health promotion of Koreans, reinforcing follow-up care and primary prevention through continuous efforts to improve the program.

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