

# An Integrative Literature Review on The Oral Health Sector of Korea National Health Promotion Plan

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**Background:** The establishment of a strategy for the reduction and prevention of oral disease, a global pervasive disease, is considered one of the important national health policy strategies. In Korea, the 5th Comprehensive National Health Promotion Plan is currently in progress, but there is insufficient research on the transition process or improvement direction in the field of oral health.

**Methods:** Changes in Comprehensive National Health Promotion Plan's Oral health sector in three countries were compared, and the direction of the three countries (Korea, the United States, and Canada) in accordance with the recent Oral health paradigm was confirmed. In this study, we reviewed the existing literature using the narrative review method to draw implications for strategies and directions for oral health promotion in Korea.

**Results:** In Korea, the oral health promotion strategy is included in the 5th Comprehensive National Health Promotion Plan, and the project is being led by the government. The United States prepared a national-led oral health promotion strategy and suggested multi-disciplinary cooperation to improve overall oral health and reduce the oral health inequality. For more active intervention, Canada established an oral health-related department and assigned experts, while emphasizing cooperation between the government and the private sector.

**Conclusion:** As a result of this study, Korea is also making efforts to improve oral health, but more active government intervention is needed to reduce the inequality in oral health by population group. To this end, it is necessary to establish a strong multi-sectoral cooperation system and prepare a strategy for implementation.

**Key Words:** National health plan, Oral health, Oral health disparity

## Introduction

### 1. Background

The pattern of disease has changed due to the development of medical technology and the rapid increase in elderly population. As a result, the burden of national healthcare expenses is increasing<sup>1)</sup>. In addition, as the demand for a healthy life has increased, it has become more important to live a long and healthy life than to extend the lifespan.

Oral disease is a non-communicable disease that is common worldwide<sup>2)</sup>. According to The Global Burden of Disease Study in 2016, since the burden of oral diseases is

continuously increasing, it is necessary to develop effective oral health strategies to reduce the burden of oral health diseases in the country<sup>2)</sup>.

In accordance with Article 4 of the National Health Promotion Act, Korea has established mid- to long-term policies for prevention of diseases and health promotion<sup>1)</sup>. And 'National Health Promotion Plan' was established<sup>1)</sup>. Since 2002, the plan has been established in 10-year units, and a supplementary plan has been prepared every 5 years. So far, a total of five comprehensive plans have been established and implemented<sup>1)</sup>. The National Health Promotion Plan also includes an Oral health promotion plan.

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The 1st Oral health promotion plan mainly consisted of the dental caries prevention project for children and adolescents, the school oral health project, and the denture prosthesis project for the elderly. In addition, it was carried out with a narrow plan to adjust the fluorine concentration of tap water and support for mobile dental health care vehicle for all age groups<sup>3)</sup>. After that, the project was more concrete in the second plan, but it was enough to supplement the goal of first plan. The oral health promotion plan has reached its third plan and includes periodontal disease, oral examination, and tooth retention rate for the elderly, and the scope of the plan has been expanded and various projects have been planned<sup>1,4,5)</sup>.

In the case of Korean national oral health, the average permanent caries experience per person in 2000 decreased from 3.3 (4th) to 2.1 in 2010 and 1.8 in 2018. However, it was more than 2 to 3 times higher in comparisons between countries<sup>6)</sup>. And, brushing after lunch was practiced by 1 in 3 people, and it has been increasing continuously since 2010. In the past year, the dental treatment attendance rate also increased to 69.0 in 2012, 69.4 in 2015, and 71.0 in 2018<sup>6)</sup>. Although the oral health of the people is gradually improving through continuous oral health promotion policy activities, it is still insufficient compared to developed countries, and continuous efforts are needed.

## 2. Objectives

In Korea, the 5th Comprehensive National Health Promotion Plan is currently in progress, but there are no changes in the oral health field. Research on the direction of improvement is insufficient. Therefore, in this study, the change and main characteristics of the oral health field of the Comprehensive Plan for National Health Promotion from the 1st to the 5th rounds are examined, and the implications and future improvement directions are examined by comparing them with cases in developed countries.

## Materials and Methods

### 1. Ethics statement

This study is a literature review of previously published studies and was therefore exempt from institutional review board approval.

### 2. Study design

This study is an integrative literature review that comprehensively analyzed research related to Health Promotion Plan for oral health.

### 3. Search and selection of literature

This study examines the transition process or improvement direction in the oral health field of the National Health Promotion Comprehensive Plan through literature review. In order to examine the trend, the cases of developed countries were analyzed.

From the first to the fifth the National Health Promotion Comprehensive Plan, major changes in the oral health field were examined, and comparative comparison, analysis, and future directions were derived from major North American cases that could be referenced. At this time, considering the possibility of subscription, English literature was limited to the subject of investigation. The oral health policy at the national level was investigated, and the United States and Canada were targeted. Specifically, the main contents and progress were compared and reviewed from the establishment and revision of the oral health plan in the US, and implications were drawn by comparing the contents of the oral health strategy in Canada.

## Results

### 1. Korea

Table 1 shows the 1st~5th Comprehensive Health Promotion Plan for Oral Health in Korea. First National Health Promotion was comprehensive.

The plan set three goals: practice of healthy living, prevention and management of chronic diseases, and health promotion by life cycle. The National Health Promotion Comprehensive Plan includes oral health-related content, mainly caries prevention projects, and denture prosthetics for the elderly to supplement the basic masticatory function. It was a project limited to dental caries, which excluded periodontal-related information, one of the two major oral diseases. However, it was positive that oral promotion projects were considered for each life cycle and that the emphasis was placed on meeting the needs of public and local health care.

**Table 1.** Changes of Oral Health in Korean Health Plan

Korean Health Plan (HP)	Leading agency	Focus area	Major initiative
HP 2010 The 1st (2002~2005)	Korean ministry of Health and Welfare	- Dental caries - Denture	1. Childhood, adolescence (7~19 age group): prevent oral cavity, projects for dental health in schools 2. Old age (over 65 age group): Providing dentures for old adults 3. Project to adjust the fluorine concentration of tap water, mobile dental health care vehicle
HP 2010 The 2nd (2006~2010)	Korean Institute for Health and Social Affairs	- Dental caries - Vulnerable population oral health	4. School Dental Health Facilities 1. Establish and operate regional and local dental treatment centers for persons with disabilities 2. Expansion of fluorine concentration of tap water 3. Dental sealant 4. Provide service of mobile dental health care vehicle for Island and mountainous area 5. Project to Tooth brushing for elementary school
HP 2020 The 3rd (2011~2015)	Korean Institute for Health and Social Affairs	- Dental caries - Periodontal disease - Tooth brushing - Oral examination	1. Decrease in dental caries experience-children, adolescents 2. Decrease in the number of dental caries teeth--children, adolescents 3. Decrease in the prevalence of dental caries-children, adolescents 4. Decrease in the prevalence of gingivitis-adolescents, adults 5. Decrease in the prevalence of periodontal disease-adults 6. Increased retention of 20 or more natural teeth-old adults 7. Increased the number of natural teeth-old adults 8. Reduced mastication discomfort -old adults 9. Increased tooth brushing after lunch-children, adolescents 10. Increased regular oral examination-infants, adults, old adults 11. Increased in the installation rate of oral rinsing rooms in facilities for children community living 12. Increased in the establishment rate of public oral healthcare centers
HP 2020 The 4th (2016~2020)	Korean Health Promotion Institute	Same as 3rd	Same as 3rd
HP 2030 The 5th (2016~2020)	Government ministries jointly	- Dental caries - Periodontal disease - Tooth brushing - Oral examination - Preventive treatment	1. Dental caries experience- primary teeth (5 years) 2. Dental caries experience- permanent teeth (12 years) 3. The number of dental caries experience- permanent teeth (12 years) 4. Prevalence of periodontal disease (34~44 years) 5. Disparity in the prevalence of periodontal disease (above 19 years) 6. Retention rate of 20 or more natural teeth disease (above 70 years) 7. Complaints of mastication discomfort (above 70 years) 8. Disparity in Complaints of mastication discomfort (above 19 years) 9. Practice rate of tooth brushing after lunch (above 1 years) 10. Disparity in practice rate of tooth brushing after lunch (above 1 years) 11. Rate of regular oral examination (above 1 years) 12. Disparity in regular oral examination (above 1 years) 13. Use of preventive dental services (above 1 years) 14. Disparity in use of preventive dental services (above 1 years) 15. The number of public oral healthcare centers 16. The number of regional and local dental treatment centers for persons with disabilities

The second plan was conducted under the vision of extending healthy lifespan and improving health equity, focusing on prevention-oriented health management in relation to oral health. This is the concept of the Health Plan 2010 mid-term inspection, and it was limited to reset-

ting the target amount to supplement the improvement points of the first project.

In the 3rd plan, HP2020 was established by reflecting the results of Health Plan 2010, and 6 of the spread of healthy living practices, chronic degenerative diseases and

disease risk factors management, infectious disease management, safe environment preservation, population health management, and business system management Oral health was included in the management of chronic degenerative diseases and risk factors. Oral health indicators and goals were detailed and subdivided compared to the 1st and 2nd rounds, and it was very advanced as it was specifically and diversely setting, including periodontal health, natural tooth retention rate, mastication discomfort, oral examination and facilities for oral health practice. In addition, from the 3rd plan, discussions on improving equity in oral health were also included.

Since the 4th plan is a plan to check and supplement the performance of the 3rd comprehensive plan, it was made to maintain the direction set in the 3rd comprehensive plan, reinforce the deficiencies in each evaluation. Oral health-related indicators were very subdivided compared to the 1st and 2nd plan, and if the plans were limited to the prevention of dental caries, the 3rd and 4th plan set policy goals such as dental caries, periodontal disease, loss of teeth in the elderly, and the status of dental medical expenses became.

The 5th plan (HP2030) is the practice of healthy living among the six key tasks of healthy living, mental health management, prevention and management of non-infectious disease, prevention and management of infection and environmental disease, health management by population group, and establishment of a health-friendly environment. What is different is that it shows that interval health is a part of a more comprehensively healthy life rather than managing disease. The main performance indicators are similar to those of the 4th, but the disparity rate considering the equality of oral health was included in the index and expanded to include the use of preventive dental care.

## 2. United States

In the United States, the National Center for Chronic Disease Prevention and Health Promotion established the Health People initiative, which included an oral health promotion plan (Table 2).

The Healthy People initiative is designed to guide national health promotion and disease prevention efforts to improve the health of the nation. Released by the U.S.

Department of Health and Human Services (HHS) every decade since 1980, Healthy People identifies science-based objectives with targets to monitor progress and motivate and focus action<sup>7)</sup>.

For Healthy People 2010~2030, The CDC has implemented various policies to achieve the following goal: preventive and control oral and craniofacial diseases, conditions, and injuries and improve access to related services. In setting forth a vision for realizing improved health for all Americans initiated in 2000, presented a set of 10-year health goals and objectives to be achieved during the first decade of the 21st century<sup>7)</sup>. The Healthy People 2010 objectives toward achieving the Healthy People 2010 goals of increasing quality and years of healthy life and eliminating health disparities. For Healthy People 2010 oral health area goals include: 1) Access: Increase racial and ethnic representation in health professions; 2) Cancer: Reduce oropharyngeal cancer deaths; 3) Increase percentage of those with annual dental examination<sup>7)</sup>.

In Healthy People 2020, the Oral Health objectives have been expanded to include a broader range. The Healthy People 2020 topic and objectives include: 1) health behaviors; 2) interventions to reduce tooth decay; 3) improved methods of monitoring oral diseases and conditions, and programs that provide preventive oral health services at the community and national levels<sup>7,8)</sup>.

The differences between the Healthy People 2010 and Healthy People 2020 objectives can be summarized as follows:

- The Healthy People 2020 Oral Health Topic Area has 33 objectives, 5 of which are developmental, and the Healthy People 2010 oral health focus Area had 26 objectives
- Seven Healthy People 2010 objectives were remained "as is". These objectives include untreated dental decay in adults, complete tooth loss in older adults, community tap water fluoridation, annual dental visits, dental care and sealants provided in school-based health centers, and community-based health centers with an oral health component<sup>7,8)</sup>.

The Healthy People 2030 focuses on reducing tooth decay and other oral health conditions and helping people get oral health care services. Many people don't get the

**Table 2.** Changes of Oral health in Health People in United States<sup>9)</sup>

Healthy People (2000)	<ul style="list-style-type: none"> <li>- Assess progress made in achieving the Healthy People 2000 objectives for oral health.</li> <li>- Highlight effective programs that have made an impact on progress and identify barriers that have hindered improvement.</li> <li>- Gain an understanding of how these national objectives are translated into opportunities for action.</li> </ul>
Healthy People (2010)	<ul style="list-style-type: none"> <li>- Increase the percentage of the population served by community public water systems that receive optimally fluoridated water.</li> <li>- Further reduce the percentage of children (age 6~8) with untreated dental decay in primary and permanent teeth.</li> <li>- Reduce the percentage of youth (age 14~15) with untreated dental decay.</li> <li>- Increase the percentage of people who use the dental system each year.</li> <li>- Increase the percentage of children who receive sealants at age 8, 14</li> <li>- Increase the percentage of dentists who counsel patients about quitting smoking</li> </ul>
Healthy People (2020)	<ul style="list-style-type: none"> <li>- Attain high-quality, longer lives free of preventable disease, disability, injury, and premature death.</li> <li>- Achieve health equity, eliminate disparities, and improve the health of all groups.</li> <li>- Create social and physical environments that promote good health for all.</li> <li>- Promote quality of life, healthy development, and healthy behaviors across all life stages.</li> </ul>

**Table 3.** Changes of Canadian Oral Health Strategy (COHS)<sup>10,14)</sup>

COHS (2005-10)	<ul style="list-style-type: none"> <li>- To advance oral health promotion, based on the determinants of health, and to foster public awareness of the importance of good oral health and of the relationship between oral health and general health.</li> <li>- To improve the overall oral health of Canadians.</li> <li>- To improve access to oral health care services.</li> <li>- To establish a country wide, standardized method of monitoring and surveillance of oral health, and to assure that oral health research is appropriately supported.</li> <li>- To assure appropriate numbers, distribution and education of oral health professionals.</li> </ul>
COHF (2013-18)	<ul style="list-style-type: none"> <li>- Improve oral health care (children and youth, Aboriginal People)</li> <li>- Ensure adequate access to oral health care.</li> <li>- Include oral health as a key part of overall health.</li> <li>- Develop Canadian framework about publicly-financed oral health care.</li> <li>- Develop and Maintain information about oral health status.</li> <li>- Health protection, oral health promotion and disease prevention.</li> <li>- Promote oral public health leadership and workforce.</li> </ul>

care they need, often because they can't afford it. Untreated oral health problems can cause pain and disability and are linked to other diseases. Strategies to help people access dental services can help prevent problems like tooth decay, gum disease, and tooth loss. Individual-level interventions like topical fluorides and community-level interventions like community water fluoridation can also help improve oral health. In addition, teaching people how to take care of their teeth and gums can help prevent oral health problems<sup>9)</sup>.

### 3. Canada

In the case of Canada, despite being a developed country in the West, the oral health strategy was insufficient until 2004 (Table 3)<sup>10)</sup>. In 2004, the government (Federal/Provincial/Territorial Dental Directors Group) and the private sector jointly established the Canadian Oral Health

Strategy (COHS) with the participation of all leadership<sup>10,11)</sup>.

Oral health is part of overall health, and improving oral health is important to improve comprehensive health and quality of life. Accordingly, COHS was developed based on the following five main themes: 1) Oral Health Promotion and Public Awareness; 2) Oral Health, and Oral Disease and Disabilities; 3) Improving Access to Care and Reducing Barriers to Oral Health Care; 4) Monitoring, Surveillance and Research; and 5) Human Resources<sup>11)</sup>.

Through the implementation of the COHS, created a chief dental office, a chief dental officer was appointed, and the oral health area was included in the Canadian Health Survey<sup>11-13)</sup>. In addition, oral health questionnaires for vulnerable groups (Inuit, Aging, etc.) were conducted, and dentist positions were additionally created in the federal government<sup>14)</sup>. Despite the implementation of the

COHS, the proportion of public dental expenses out of total dental expenses was very low at 5.1%, and inequality in access to dental care continued according to socio-economic level<sup>13,14</sup>. Also, due to the deficiency in access to dental care, the oral health of First Nation and Inuit were not good, and dental caries of many refugees and immigrants was continuously increasing<sup>14</sup>. The Canadian Oral Health Framework was developed by reflecting these circumstances<sup>10,13,14</sup>. COHF focused on low income, recent immigrants, the disabled and the elderly, and set high oral disease burden and improved access to dental care as priority goals<sup>10,14</sup>.

The difference between COHS (2005 ~ 2010) and COHF (2013 ~ 2018) is that COHS has made significant advances in public oral health with the goal of improving the oral health of all Canadians, whereas COHF has a higher disease burden for oral diseases<sup>10,13,14</sup>. And this can be attributed to the fact that it prioritizes improving the medical delivery system for the underprivileged with low access to medical care<sup>14</sup>.

## Discussion

### 1. Interpretation

As a result of reviewing the 1st to 5th visions of the Korea National Health Promotion Plan, the 1st part is a society where a 75-year-old can realize a healthy longevity, the 2nd part is a healthy world where all people can live together, and the 3rd and 4th part is a society where people can create and enjoy together. It was implemented with the vision of a healthy world<sup>1,3-5</sup>. The 5th vision also aims to extend healthy lifespan and improve health equity as a 'society where everyone can enjoy lifelong health'<sup>7</sup>. The National Health Promotion Plan is a plan to systematically link health promotion-related policies according to other laws to achieve the overall goal of health policy. The visions and goals were set at the national level to cope with health policy problems and changes in future circumstance, and strategies were presented<sup>1</sup>.

### 2. Key results and comparison with the results of previous studies

Oral disease is one of the representative chronic diseases,

and in the case of chronic diseases, if treated at an early stage through early detection, health and economic effects can be achieved. In Korea, national health insurance is implemented, and most people are enrolled in health insurance as insured, received regular health examinations at least once every two years. Since oral examinations are essential to such regular health examinations, oral diseases can be easily detected through oral examinations. However, in the case of regular oral examinations provided by the National Health Insurance Corporation, it is only a matter of understanding the state of oral health. This is thought to be because, in the case of the cost of oral examination, which is currently covered by health insurance, it is generally sufficient to cover only the diagnosis by examination<sup>15,16</sup>. For a more accurate oral examination, various diagnostic methods such as radiographic and clinical pathology examination should be available<sup>17</sup> but the oral examination itself is limited due to cost limitations. In addition, based on the results of oral examinations, it appears that there is a limit to providing guidance on how to practice oral health for health promotion and oral health education<sup>17</sup>. Although the school oral health project or each local government's oral health promotion strategy has been sought and implemented, there is a limit to encompassing the entire nation through this. It is necessary to develop effective strategies to promote oral health based on oral health practices as well as early detection and treatment of oral diseases by more actively utilizing the oral examination system implemented under the national health insurance system.

### 3. Suggestion

For the consistent and continuous implementation of the oral health strategy, it is thought that the expansion of an organization in charge of oral health and the investment of public funds should be expanded. Although the Department of Oral Health Policy was newly established in the Ministry of Health and Welfare in 2016, its size is very small compared to other countries. In addition, in order to implement effective oral health strategies, it is necessary to develop an active cooperation system between the public and private sectors for each local government. The input of public resources is essential to the implementation of



oral health strategies targeting the socio-economically disadvantaged<sup>18)</sup>. It is thought that cost-effective policies and interventions are needed to resolve the continuing inequality in access to dental care. However, the government-led oral health strategy for the entire population is expected to have human and material limitations. Accordingly, as in the case of Canada, technical support and policy promotion should be strengthened through the development of a public-private cooperative system and networking for human resource utilization<sup>10,14,18)</sup>. In addition to implementing the current government-led oral health strategy, it would be desirable to develop a cooperative system that actively utilizes the oral health expert group and to gradually expand participation.

#### 4. Limitations

Limitations of this study include the fact that only North American countries were compared, and the narrative review process may have limited literature selection. Therefore, future studies should be more comprehensive, including European and Oceania states, and consideration should be given to improving validity through systematic reviews.

### Notes

#### Conflict of interest

No potential conflict of interest relevant to this article was reported.

#### Ethical approval

This study is a literature review of previously published studies and was therefore exempt from institutional review board approval.

#### Author contributions

Conceptualization: Ji-Hyoung Han and Eunsuk Ahn. Supervision: Eunsuk Ahn. Writing—original draft: Ji-Hyoung Han and Eunsuk Ahn. Writing—review & editing: Ji-Hyoung Han and Eunsuk Ahn.

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#### Data availability

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