



ISSN: 2586-6036

JWMAP website: <http://acoms.accesson.kr/jwmap>doi: <http://dx.doi.org/10.13106/jwmap.2023.Vol6.no4.63>

The Role and Necessity of Public Health Services in a Remote Area

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Received: December 13, 2023. Revised: December 18, 2023. Accepted: Decemebr 18, 2023.

Abstract

Purpose: This study aims to investigate the national obligation of public health support for residents in medically vulnerable areas in Korea, and to propose a suitable model for public health institutions in this region. **Research design, data, and methodology:** A survey targeting residents was conducted from August 10 to August 17, 2021, with a sample size of 177 general citizens. The survey utilized a structured questionnaire administered online through Google, employing convenience random sampling. After an editing process to ensure data accuracy, the final dataset of 174 valid samples underwent encoding, coding, and cleaning using the IBM SPSS Statistics 22.0 program for analysis. **Results:** Health status revealed a moderate level, and 63.8% reported having chronic diseases, particularly prevalent among the elderly. External healthcare institutions were commonly utilized, with proximity and competence of doctors being primary reasons. Respondents expressed a need for improving the public health and medical system, emphasizing the establishment of a County Health Centre and expanding medical departments. **Conclusions:** In this region, the region's unique challenges, including education, employment, population decline, aging, and transportation, require multidimensional efforts and urgent intervention by public entities. Long-term strategies involve considering the establishment of a health and medical institute, adjusting health centre resources to local realities, and fostering a cooperative system for collaboration among residents and institutions.

Keywords : National Public Health, Vulnerable Areas, Role, Necessity, Suitable Model

JEL Classification Code : I00, I10, I12, I14, I19

1. Introduction

Yeongyang-gun is a county located in the northeastern part of Gyeongsangbuk-do, South Korea, known for its large and mountainous areas, including the large and small valley, and it boasts the highest elevation in Gyeongsangbuk-do. The total area of this region is 815.14 square kilometers (85.6% forested, 1.3 times the size of Seoul), with administrative divisions consisting of 1 eup, 5 myeons, 114 villages, 484 neighborhoods, and 275 natural communities. With a fiscal self-reliance rate of approximately 10.8% and 68.3% of the population engaged in agriculture, Yeongyang-gun is a typical rural area with a sparse population scattered across extensive mountainous terrain, emphasizing the need for individual, group, and outreach health services.

Transportation to Yeongyang-gun is limited compared to the southern regions penetrated by Gyeongsangbuk-do's Gyeongbu Line (KTX) and Gyeongbu Expressway. The county relies solely on national and local roads, with single and dual-lane roads and no four-lane expressways. As of 2020, Yeongyang-gun's total population stands at 16,680, making it one of the smallest local government units in South Korea. The population comprises 37.6% individuals aged 65 and above, 0.69% with disabilities, and 48.3% living in 4,404 farming households.

One of the significant challenges in Yeongyang-gun is the aging population and the relatively low economic conditions affecting the residents' health (Yang, 2012; Moon, 2020; Kim, 2021). The prevalence of chronic diseases is higher than in urban areas, and standardized death rates also surpass those in other cities. Factors contributing to the elevated chronic disease rates include the aging population, as well as an increase in agricultural accidents due to the mechanization and modernization of farming practices (Jeon & Kim, 2010; Lee et al., 2011; Sun, 2016). Yeongyang-gun's suicide rate is notably high, with 70.6 suicides per 100,000 people compared to the national average of 26.9, particularly affecting those aged 60 and above. Therefore, addressing mental health and implementing suicide prevention measures are crucial in this region.

2. Environmental Situation of Yeongyang-gun

2.1. Population and Geographical Aspects

2.1.1. Population Characteristics

According to the resident registration data, Yeongyang-gun's total population has been continuously decreasing, standing at 16,680 as of 2020. Analyzing population

distribution by townships reveals that 42.9% reside in Yeongyang-eup, with the remaining 5 myeons ranging from 0.3% to 13.1%.

Examining population changes by life cycle, the population of the 0-14 age group is decreasing, while the 15-64 age group shows a declining trend unique to Yeongyang-gun, contrary to national and Gyeongsangbuk-do trends. The population of individuals aged 65 and above is rapidly increasing, reaching 31.4% compared to the national average of 12.2% in 2019, indicating a significant rise in elderly population and related health issues.

2.1.2. Aging Index, Dependency Ratio, Elderly Dependency Ratio

Yeongyang-gun's aging index, total dependency ratio, and elderly dependency ratio are consistently higher than the national and Gyeongsangbuk-do averages, showing an annual upward trend. The youth dependency ratio is lower than the national and Gyeongsangbuk-do averages, indicating a continuous decrease.

2.1.3. Total Fertility Rate in Yeongyang-gun

The total fertility rate in Yeongyang-gun has been increasing annually. However, the birth rate is gradually decreasing by 6.8-10.5% each year compared to the mortality rate. Considering the increase in the elderly population, strategies for health and medical services for residents dispersed in the myeons need to be developed.

2.1.4. Insufficient Specialized Health and Medical Services for the Elderly in Yeongyang-gun

Yeongyang-gun lacks specialized service programs linked to local health institutions and welfare facilities. With a high proportion of elderly residents, this issue extends beyond individual or familial concerns and requires comprehensive evaluation and collaboration at the community and governmental levels. As of 2019, 37.0% of Yeongyang-gun's total population of 16,549 is aged 65 and above, significantly higher than the Gyeongsangbuk-do average of 22%.

Efforts are needed to address the diverse issues faced by elderly residents in a rapidly aging society (Park, 2012; Lee, 2017). The proportion of single-person households among general households in Yeongyang-gun is 21.3%, much higher than the national average, emphasizing the necessity for mutual understanding and a close cooperative system between individuals, families, local communities, and governmental bodies.

2.1.5. Other Characteristics

With a declining and sparsely populated area, Yeongyang-gun faces challenges such as a high percentage of vulnerable populations, including basic livelihood protection beneficiaries (6.5%, compared to the national average of 3.0%), upper-lower-income individuals (3.2%), solitary elderly individuals (20.8%, compared to the national average of 7.0%), and people with disabilities (10.6%, compared to the national average of 4.9%). Addressing these challenges requires a comprehensive approach involving individuals, families, communities, and governmental bodies (Lim et al., 2010; Yim, 2022).

Table 1: Cities and Counties in Nationwide and Gyeongsangbuk-do with an Elderly Population Ratio of 30% or More

Administrative district	Population aged 65 and older (No.)	Total population (No.)	Elderly population ratio (%)
Nationwide	8,574,588	51,705,905	16.6
Gyeongsangbuk-do	581,043	2,635,563	22.0
Uiseong	21,613	51,404	42.0
Gunwi	9,507	23,094	41.2
Cheongdo	16,190	42,119	38.4
Yeongdeok	13,836	36,043	38.4
Cheongsong	9,435	24,907	37.9
Yeongyang	6,280	16,549	37.9
Bonghwa	11,640	31,232	37.3
Seongju	14,077	43,105	32.7
Goryeong	9,992	31,167	32.1
Sangju	30,762	96,855	31.8
Mungyeong	21,928	71,924	30.5
Yecheon	16,938	55,649	30.4

2.2. Healthcare Institutions in Yeongyang-gun

2.2.1. Public Healthcare Institutions

There is one public health center in Yeongyang-eup. The health center comprises various teams, including the Health Administration Team, Infectious Disease Management Team, Preventive Medicine Team, Community Health Team, Health Promotion Team, Medical Support Team, Mental Health Team, and Infectious Disease Response Team. Under this health center, there are five health sub-

centers, and beneath each sub-center, eight health clinics are in operation.

2.2.2. Private Healthcare Institutions

The largest hospital in Yeongyang-gun is located in Yeongyang-eup, offering departments in Family Medicine and Plastic Surgery. The hospital has 12 inpatient rooms and 50 beds. Additionally, there is Yeongnam Clinic in Yeongyang-eup, along with three dental clinics, two oriental medicine clinics, and four pharmacies. Furthermore, there are two traditional Korean medicine clinics and other miscellaneous healthcare facilities.

3. Research Methods

3.1. Survey

A survey was conducted targeting residents of Yeongyang-gun. The survey period was from August 10, 2021, to August 17, 2021, and the sample size was 177 general citizens of Yeongyang-gun. The survey method involved using a structured questionnaire for general citizens of Yeongyang-gun, and respondents filled out the survey directly online through Google. The sampling method employed was convenience random sampling (Kasl & Cob, 1966; Sohn, 2022). Statistical analysis methods included frequency analysis, descriptive statistics, and cross-tabulation.

3.2. Data Processing

The final surveyed valid samples underwent an editing process to check for recording errors and omissions. Subsequently, the data were encoded and coded, and data cleaning was performed to identify and rectify any errors in the dataset. Among the total 177 samples, 174 valid samples were used for analysis, employing the IBM SPSS Statistics 22.0 program.

4. Research Results

4.1. Demographic Characteristics

The frequency and ratio composition of the subjects' characteristics are as follows:

In terms of age distribution, 50-59 years old constitute 41.4%, and 60-69 years old make up 35.6%, indicating an aging population. By gender, 76.4% are male, and 23.65% are female. Looking at occupations, agriculture and livestock farming account for the highest percentage at 46.0%, followed by self-employed individuals at 17.8%.

Table 2: Frequencies and Composition Ratios of Characteristics for Survey Participants (Unit: No., %)

Classification		Frequency	Ratio
Total		174	100.0
Age	29 years old and below	2	1.1
	30-39 years old	7	4.0
	40-49 years old	22	12.6
	50-59 years old	72	41.4
	60-69 years old	62	35.6
	70 years old and above	9	5.2
Gender	Male	133	76.4
	Female	41	23.6
Current Residence	Urban area within yeongnang-eup	92	52.9
	Rural Area	74	42.5
	Others	8	4.6
Occupation	Agriculture and Livestock Farming	80	46.0
	Self-Employed	31	17.8
	Professional and Technical Occupation	15	8.6
	Sales and Service Occupation	4	2.3
	Public Servant	12	6.9
	Company Employee	12	6.9
	Unskilled Labor	6	3.4
	Homemaker	5	2.9
	Student	2	1.1
	Unemployed	7	4.0

4.2. Health Status

Regarding the overall health status, 4.0% responded as 'Very Good,' and 30.5% as 'Good,' totaling 34.5%. The majority, 58.0%, reported their health as 'Average.' When assessed on a 5-point scale, the overall average health rating was 3.30 points, indicating a moderate level between 'Average' and 'Good.' Examining characteristics of each

subject, individuals aged 40-49 rated their health the highest at 3.73 points, while males scored 3.36 points relatively higher. In terms of current residence, excluding Yeongyang-eup and rural areas, other locations scored 3.63 points. Occupation-wise, civil servants scored the highest at 3.67 points, followed by the unemployed at 3.57 points.

4.3. Presence of Chronic Diseases

Regarding the presence of chronic diseases among the 174 respondents, 111 individuals (63.8%) indicated having chronic diseases. Analyzing characteristics of the subjects, the response of 'having chronic diseases' was higher among those aged 60-69 (72.6%) and those aged 70 and above (66.7%). Females (68.3%) had a slightly higher response compared to males (62.4%). Among the current residence areas, respondents from other regions outside of Yeongyang-eup and rural areas showed the highest response at 87.5%. Occupation-wise, the unemployed (85.7%) and simple laborers (83.3%) had the highest responses of 'having chronic diseases.'

4.4. Utilization of Healthcare Facilities

Regarding the primary healthcare institutions used for diseases or health check-ups, 'External Healthcare Institutions' outside of Yeongyang-gun had the highest response at 46.0%, followed by 'Yeongyang Hospital' and 'Health Centers (including sub-centers and clinics)' within Yeongyang-gun at 18.4% and 16.7%, respectively. Analyzing characteristics of the subjects, 'Housewives' showed the highest utilization of 'Health Centers (including sub-centers and clinics)' at 60.0%. Overall, respondents tended to utilize 'External Healthcare Institutions' outside of Yeongyang-gun the most, regardless of other characteristics.

4.5. Reasons for Primarily Using Healthcare Facilities

Regarding the main reasons for using healthcare facilities, among the 174 respondents, 'Doctor's competence (professionalism)' had the highest response at 31.6%, followed by 'Close distance (convenient transportation)' at 26.4%, and 'Modern facilities and medical equipment' at 16.7%. Overall, there was a general trend where respondents prioritized 'Doctor's competence (professionalism),' 'Close distance (convenient transportation),' and 'Modern facilities and medical equipment' in that order, regardless of individual characteristics.

4.6. Public Health and Medical System

4.6.1. Enhancement of the Public Health and Medical System

When asked how to enhance the public health and medical system in the Yeongyang-gun area, among 106 respondents, 'Establishment of a County Health and Medical Center (Integrated with the current health center)' had the highest response at 57.5%. Following this, 'Reinforce and Expand the Functions of Yeongyang Hospital' and 'Introduce and Operate an Emergency Medical Service System at Bohyeon Health Center' had responses of 36.8% and 4.7%, respectively.

4.6.2. Areas of Need in Public Health and Medical Services

Among 106 respondents, regarding additional areas needed in future public health and medical services in Yeongyang-gun, there were a total of 240 multiple responses. 'Expansion of Medical Departments' had the highest count at 74 responses (30.8%), followed by 'Emergency Medical Care' and 'Rehabilitation Center (for the Elderly and Disabled)' with 46 responses (19.2%) and 31 responses (12.9%), respectively.

Table 3: Specialized Fields Required in Public Health and Medical Services (Unit: No., %)

Service Field	Number of Cases	Ratio
Rehabilitation Center (Elderly, Disabled)	31	12.9
Nursing and Care (Rooms without a Guardian)	26	10.8
Hospice (Terminal Cancer, Dying Patients)	7	2.9
Comprehensive Examination Center (Early Disease Detection)	13	5.4
Cardiovascular Specialty Center	14	5.8
Emergency Medical Care	46	19.2
Nighttime Medical Care	13	5.4
Expansion of Medical Departments	74	30.8
Health Promotion Center	14	5.8
Infectious Disease Management, including COVID-19	2	0.8
Total	240	100.

5. Conclusions

To fulfill the functions of public health and medical institutions in Yeongyang-gun, it is essential to develop medical capabilities that can appropriately address healthcare needs at each stage, from prevention to acute and sub-acute phases, to long-term care (Lee et al., 2012; Kim et al., 2014; Yang & Lee, 2017). The medical capabilities in Yeongyang-gun should not only provide direct services but also collaborate and coordinate with other institutions such as the Yeongyang-gun Health Center to offer indirect services as needed. Given that Yeongyang-gun is a medically underserved area with challenges in education, employment, population decline, rapid aging, and transportation conditions, multidimensional efforts are crucial. There is an urgent need for the expansion of the public health and medical system through the intervention of public entities such as Yeongyang-gun and Gyeongsangbuk-do (Lee 2021; Sohn et al., 2015).

In Yeongyang-gun, a significant proportion of users of public health and medical institutions are from the economically vulnerable population, particularly those eligible for medical aid. To serve as a last refuge for the impoverished, the health center's medical functions need to be expanded (Lee, 2009). Public health doctors should play a central role in community health, while health center directors should have a support system to plan, execute, operate, and evaluate local projects. Bridging the gap between the health center and local residents is crucial. The tasks of health centers in Yeongyang-gun should be diversified according to the region's characteristics, and regulations or guidelines should specify these tasks clearly. The staffing, equipment, and budget of health centers need to be adjusted to the reality of Yeongyang-gun's community. Building a cooperative system for mutual collaboration among residents, organizations, and institutions is essential.

In the long term, Yeongyang-gun should consider the establishment and operation of a health and medical institute, including a regional medical center. To ensure that the health and medical institute performs roles and functions suitable for the region, it may be necessary to deploy additional health and medical institutes or expand and strengthen existing ones, including health centers. Yeongyang-gun's health center should perform roles across the entire spectrum of health, healthcare, medical services, and caregiving, similar to the roles performed by the central government. Establishing and operating a health and medical institute is one approach. Efficient management of human resources and finances is crucial for the effective operation of public hospitals, ensuring a balance between operational efficiency and public service. This will require

the formulation of diverse strategies through careful planning.

6. Limitations of the Study

Not enough consideration has been given to the various indicators and regional characteristics of Yeongyang-gun. Furthermore, additional research is required regarding the legal and regional support provided by the public health and medical system.

In addition, incorporating interviews with experts or conducting in-depth interviews with local residents would allow for a more diverse exploration of the role and significance of public health and medical services in Yeongyang gun.

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