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Community Integration Study through Rehabilitation Medical Support for People with Disabilities

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Abstract

Purpose: This study is to propose the establishment and direction of a public health-medical cooperation system for rehabilitation medical services for people with physical and brain disabilities in Gangneung, Korea. **Research design, data and methodology:** The study focused on 30 individuals with these disabilities registered. Data was collected from December 20, 2021, to December 31, 2021, through structured surveys administered by researchers visiting disability-related facilities, utilizing convenience and random sampling methods. Descriptive statistics and cross-analysis were applied for analysis. **Results:** Specifically, among respondents with physical disabilities, a total of 20 needs were identified, with 'Visiting health services' (25.0%) and 'Oral health services' (20.0%) ranking highest. The survey results regarding visit-based rehabilitation services for disability support showed a high demand, emphasizing the necessity of service provision tailored to the needs of recipients, focusing on disability prevention, health management, and motor function recovery, rather than solely medical or therapeutic concepts. **Conclusions:** Gangwon National University Hospital, as the regional referral hospital in Gangwon, should collaborate with Gangwon Province Rehabilitation Hospital to provide prompt acute rehabilitation services. Moreover, cooperation and collaboration with Gangneung Asan Hospital, the tertiary hospital in the region, are essential to ensure continued acute and recovery phase rehabilitation therapy for a certain period in the Gangneung area.

Keywords : Disability, Rehabilitation Health Care Services, Public Health Care, Community Connection, Return to Social Function

JEL Classification Code : II0, I00, II1, I18, I19

1. Introduction

In Korea, Gangneung Medical Center, located in Gangneung City, Gangwon Province, is a public medical institution. It enhances the coordination, cooperation, and adjustment functions with healthcare institutions and related organizations within its intermediate medical care area and efficiently executes the establishment of a public health-medical cooperation system. Particularly, the institution's function in the development of collaboration models in the rehabilitation field shows a mix of functions related to rehabilitation medical facilities and services, indicating an urgent need for a restructuring of the rehabilitation medical delivery system and functional realignment in Gangneung City, Gangwon Province.

In terms of medical complexity, the transfer of patients to rehabilitation medical institutions among hospitals deemed unsuitable due to medical complexity can lead to high occurrences of complications and rehospitalization. Therefore, to address this issue, coordinated systems between rehabilitation medical institutions, nursing hospitals, and public health centers (community-based visitation rehabilitation programs) need to be established to maintain and improve the comprehensive quality of rehabilitation medical services consistently. Moreover, with the increasing need for visitation rehabilitation services, it becomes increasingly important to confirm the feasibility of providing visitation rehabilitation services for severely disabled individuals at local responsibility medical institutions, as the abolishment of the clause for visitation rehabilitation under the Long-Term Care Insurance Act (violating the Medical Service Act), exclusion of visitation rehabilitation therapy from disability health care management business, and quality deterioration of medical services due to the replacement of specialized personnel in public health centers are observed.

Enhancing accessibility to healthcare services for people with disabilities and ensuring the right to mobility for rehabilitation patients and severely disabled individuals is urgently needed for the health and welfare of people with disabilities. However, in an environment where supply and institutional support systems are significantly lacking compared to demand, it is not easy to explore directions to enhance healthcare accessibility for people with disabilities through initiatives such as remote rehabilitation collaboration or networks with local disability taxis and general transportation companies. Therefore, it is considered crucial to periodically monitor the healthcare environment, resources, and patterns of medical utilization of local residents to assess the suitability of such collaborations and service connections. Robust evaluation of models featuring Social Determinants of Health interventions in partnership with community-based organizations is recommended as home and community-based care infrastructure expands (Angelelli et al., 2021).

Currently, certain essential public health-medical cooperation areas for general patients, such as "Community Integration Program for Discharged Patients with Elderly Arthritis in Gangneung Area, Cooperation Project for Transfer and Referral of Severe Emergency Patients in Gangneung Area, Collaboration Project for Infection and Patient Safety Management in Gangneung Area, and Support Program for Health Care Professionals and Residents' Education in Gangneung Area," are being implemented to some extent. However, there is a pressing need for empirical research on the "Community Integration Program through Rehabilitation Medical Service Support for People with Disabilities," which is integrated with the public health-medical cooperation system of Gangwon Province and Gangneung City. This is crucial due to the significant importance of contributing to the development of the community by addressing the needs of marginalized groups and promoting a shift in perceptions towards people with disabilities.

The majority of disabilities in Korea are related to physical and brain impairments (Kim & Joung, 2007). As we enter an era where human rights prohibit discrimination, there is an urgent need to address practical issues arising from service disparities among different types of disabilities. However, there remains a lack of fundamental data that can enhance the quality of life for people with brain impairments and promote their social participation, despite relatively insufficient societal consideration in policy and clinical dimensions (Lee, 2016). Factors such as the increase in vulnerable workers, including irregular workers, immigrant laborers, the elderly, and women, due to changes in industrial structure and employment environments, as well as the continuous rise in factors causing accidents, such as the increase in subcontracting by large companies to small-scale businesses, are expected to persist (Do, 2014).

Previous research on disabilities has primarily focused on demographic characteristics, disability-related traits, and individual characteristics (Starr & Heiserman, 1977;

Belgrave, 1991; Park, 2006). Although there have been studies on the status and needs of rehabilitation services for children with disabilities (Jung & Seo, 2010), there is a significant lack of research on the current status and needs of rehabilitation services for general individuals with physical and brain disabilities. Therefore, this study aims to propose the establishment and direction of a public health-medical cooperation system for rehabilitation medical services for people with physical and brain disabilities. It is anticipated that by providing detailed policy proposals to realize this goal, contributing to the development of the community through consideration for marginalized groups and a shift in perceptions towards people with disabilities, practical contributions to the community will be made.

2. Theoretical Backgrounds

2.1. Role and Functions of Public Healthcare Institutions

In Korea, public healthcare institutions serve as establishments for realizing the constitutional right to national health. It's crucial to recognize that the services provided by public healthcare institutions are not merely supplementary or complementary but constitute essential services that must be provided to the public. Therefore, it's paramount for public healthcare institutions to faithfully execute national and local government public healthcare policies. In times of national disasters, these institutions play a pivotal role as central treatment hospitals, which distinguishes them from private medical institutions. Welfare programs for people with disabilities supported by national funding include the establishment of regional rehabilitation centers, medical facilities, welfare facilities, vocational facilities, mental health care facilities, facilities for social reintegration, and residential facilities (Yu, 2005).

Under the Ministry of Health and Welfare in Korea, the National Rehabilitation Center plays a central role as the central institution for disability health care. Specifically, it undertakes core tasks such as regional rehabilitation hospital public rehabilitation projects, support for local disability health care centers, disability health care management, disability-friendly health examination projects, and health care management for women with disabilities. Thus, the National Rehabilitation Center carries out various educational support programs for the social reintegration and rehabilitation independence of people with disabilities. Specifically, it focuses on planning health care management programs, building delivery systems for disability health care management, developing and disseminating new technologies and guidelines related to disability prevention, treatment, and rehabilitation to enhance comprehensive health management, and expanding the foundation for health care management by providing information, statistical analysis, and support related to disability health care.

Gangneung Medical Center in Gangwon Province was selected as a regional responsibility medical institution in the August 2020 Ministry of Health and Welfare's Public Health-Medical Cooperation System Construction Project. This institution is tasked with strengthening cooperation with local medical institutions and related organizations, addressing issues related to essential medical services, and coordinating and aligning efforts to resolve them. It is anticipated that the National Rehabilitation Center's role as the central institution for disability health care will be solidified through close collaboration with Gangneung Medical Center, the designated responsibility medical institution, thus fostering the activation and promotion of regional rehabilitation hospital public rehabilitation projects in the area.

Meanwhile, public rehabilitation medicine refers to rehabilitation medical services in the field that cannot be supplied to a socially desirable level solely through voluntary private provision (Lee & Lee, 2020). This service encompasses early return-to-society programs, home visit rehabilitation programs, disability health promotion programs, coordinated programs with public health centers, welfare facilities, education, promotion, research projects, and more. In Korea, there are seven regional rehabilitation hospitals nationwide, with Gangwon Provincial Rehabilitation Hospital serving as the regional facility for Gangwon Province. Gangwon Provincial Rehabilitation Hospital, designated by the Ministry of Health and Welfare, operates as a patient-centered rehabilitation institution under a wide and pleasant resort-style rehabilitation environment, providing systematic and efficient rehabilitation therapy and various social rehabilitation programs to facilitate early return home. The institution boasts specialized rehabilitation therapy medical staff, state-of-the-art equipment, and diagnostic capabilities, while contributing to the establishment of standards in rehabilitation therapy.

Therefore, Gangneung Medical Center, as a collaborative institution with Gangwon Provincial Rehabilitation Hospital in the region, can maintain the public healthcare institution cooperation system. These two institutions can fulfill their duties as responsible public healthcare institutions for health and happiness in the community. In other words, based on mutual cooperation services, they can encourage the early return-to-society program for people with disabilities through coordination with the public rehabilitation

operation team, fostering confidence in social participation through emotional stability, enhancing the effectiveness of inpatient treatment, and facilitating the swift return of people with disabilities to society.

2.2. Status of Rehabilitation Hospitals in Gangwon Province and Gangneung City

2.2.1. Gangwon Province Rehabilitation Hospitals

Outside of Gangneung City, there are four major rehabilitation hospitals in Gangwon Province, including Gangwon National University Hospital, Hallym University Chuncheon Sacred Heart Hospital, Gangwon Provincial Wonju Medical Center, and Severance Hospital Wonju, affiliated with Yonsei University. Among these, Gangwon National University Hospital also operates the "Gangwon Province Rehabilitation Hospital" as an adjunct institution through commissioned operation.

2.2.2. Gangneung City Rehabilitation Hospitals

Within Gangneung City, there are three main institutions providing rehabilitation hospital services: Gangneung Asan Hospital, Gangneung Dongin Hospital, and Gangneung Medical Center.

Gangneung Asan Hospital is a large general hospital, a tertiary healthcare institution, with two rehabilitation medicine specialists providing rehabilitation therapy services. The key specialized rehabilitation medical services offered by this institution include rehabilitation for stroke, spinal cord injury, peripheral nerve disorders, musculoskeletal disorders, lymphoma patients, sports rehabilitation, cerebral palsy, spinal cord injury, back pain, arthritis, cognitive-linguistic disorders, and more. Gangneung Dongin Hospital is a comprehensive hospital with one rehabilitation medicine specialist providing rehabilitation therapy services, focusing on specialized rehabilitation medical services such as neurorehabilitation, spinal cord injury rehabilitation, and electromyography tests. Gangneung Medical Center is also a comprehensive hospital with one rehabilitation medicine specialist providing rehabilitation therapy services, offering specialized rehabilitation medical services across various fields such as brain injury rehabilitation, spinal cord injury rehabilitation, musculoskeletal rehabilitation, and other aspects of rehabilitation medicine.

Table 1: Current Status of Rehabilitation Hospitals in Gangneung City

Scale	Medical Institution	Primary treatment/target
General Hospital	Gangneung Asan Hospital	Stroke, Spinal cord injury, Cerebral palsy, Lower back pain, Arthritis, Cognitive-linguistic disorder, Sports injury rehabilitation
General Hospital	Gangneung Dongin Hospital	Stroke, Brain injury, Spinal cord injury, Cerebral palsy, Developmental delay, Muscular dystrophy, Neuromuscular disorders, Foot pain, Assistive devices
General Hospital	Gangneung Medical Center	Brain injury rehabilitation, Spinal cord injury rehabilitation, Musculoskeletal rehabilitation, Other rehabilitation medicine

2.3. Overview of Facilities and Services for People with Disabilities

2.3.1. Overview of Disability-related Healthcare Facilities

The specific types and operations of disability welfare facilities are determined by the Ministry of Health and Welfare's regulations. Regarding the delivery system of services for people with disabilities, services are scattered across various departments and tasks related to disability welfare, leading to difficulties in promptly meeting the needs of people with disabilities. Additionally, insufficient coordination among departments has led to issues of duplicated service provision (Park & Lee, 2017). The installation and operation standards for disability welfare facilities are based on the facility standards, staffing standards for management and operation, etc., according to the Appendix 5 of the Enforcement Rules of the Disability Welfare Act. Disability welfare facilities are classified into five types: residential facilities, community rehabilitation facilities, vocational rehabilitation facilities, production and sales facilities, and medical rehabilitation facilities.

Community rehabilitation facilities are the second most common type of facility where people with disabilities reside, following residential facilities. Daycare centers, in particular, are the most widely used spaces by people with disabilities nationwide, followed by welfare centers, sign language interpretation centers, and life mobility support centers. Local governments, burdened by the operation of vocational rehabilitation facilities due to inter-regional transfer projects, need to recognize that the budget allocated for severe disability rehabilitation is an investment rather than a consumptive cost (Lee, 2019).

Table 2: Types of Disability Welfare Facilities

Residential facility	Community rehabilitation facility	Vocational rehabilitation facility	Product sales facility	Medical rehabilitation facility
1. Disability-specific residential facility 2. Severe disability residential facility 3. Disability infant/toddler residential facility 4. Short-term disability residential facility 5. Disability group home	1. Welfare center 2. Daycare facility 3. Sports facility 4. Training facility 5. Independent living support center 6. Sign language interpretation center 7. Braille library 8. Braille and audio book publishing facility 9. Rehabilitation therapy facility	1. Sheltered workshop 2. Employment facility 3. Vocational adjustment training facility	Product sales facility	Medical rehabilitation facility

2.3.2. Current Status of Major Disability Welfare Facilities in Gangwon

As of 2020, the total population of Gangwon Province is 1,561,172. Among them, 55.10% reside in the three major cities of Gangwon Province: Gangneung, Wonju, and Chuncheon. Specifically, the population distribution in Gangwon Province is as follows: Wonju (357,710 people), Chuncheon (286,489 people), Gangneung (215,603 people), followed by other cities such as Donghae (91,492 people) and Sokcho (83,674 people).

As of 2018, the total number of people with disabilities in Gangwon Province is 100,693. Among them, 46.93% reside in the three major cities: Gangneung, Wonju, and Chuncheon. The distribution of people with disabilities in Gangwon Province is as follows: Wonju (18,245 people), Chuncheon (15,639 people), Gangneung (13,373 people), followed by other cities such as Donghae (6,767 people), Samcheok (5,521 people), Hongcheon (5,098 people), and Sokcho (4,936 people). Particularly, Wonju and Chuncheon have more facilities for individuals with intellectual disabilities compared to Gangneung. Although Wonju has the highest population, facilities for people with disabilities are particularly concentrated in Chuncheon. Gangneung is characterized by a high number of shared living facilities.

Table 3: Current Status of Major Disability Residential Facilities in Gangwon Province (Unit : No.)

Area	Disability-specific residential facility			Severe disability	Short-term	Collective	Total
	Physical disability	Visual impairment	Intellectual disability				
GangWon	1	1	17	15	6	27	67
WonJu	0	0	4	2	2	6	14
Chuncheon	0	1	4	1	3	7	16
Gangneung	0	0	1	2	1	9	13

While Wonju has a larger resident population and number of people with disabilities, Chuncheon has a greater number of local community rehabilitation facilities for the overall disabled population. Notably, Gangneung and Wonju lack braille libraries among their local community rehabilitation facilities.

Table 4: Current Status of Major Disability Community Rehabilitation Facilities in Gangwon Province (Unit : No.)

Area	Disability welfare center	Daycare facility	Sign language interpretation center	Mobility support center	Braille library	Total
GangWon	10	16	18	19	1	64
WonJu	1	4	1	1	0	7
Chuncheon	2	4	2	2	1	11
Gangneung	1	3	1	1	0	6

2.3.3. Current status of disability welfare facilities in Gangneung

In accordance with the Disabled Welfare Act, among the five types of disability welfare facilities—residential facilities, local community rehabilitation facilities, vocational rehabilitation facilities, product sales facilities, and medical rehabilitation facilities—only the "product sales facilities" are not currently operational in Gangneung's disability welfare facilities. As of January 2022, Gangneung's disability welfare facilities are categorized into residential facilities (11), vocational rehabilitation facilities (3), and local community rehabilitation facilities (6), totaling 27 operational facilities. Additionally, there are five other disability centers and two individual disability facilities in operation. Local community rehabilitation

facilities are particularly significant as they are the second most frequented facilities by people with disabilities after residential facilities. Among these, day care facilities are overwhelmingly the most utilized spaces nationwide, followed by welfare centers, sign language interpretation centers, and life support centers.

Table 5: Current Status of Disability Welfare Facilities in Gangneung City (Unit : No.)

Residential facility			Vocational rehabilitation facility		Community rehabilitation facility						
Living facility	Short-term facility	Communal living	Production facility	Sales facility	Welfare	Day care	Sign Language Interpretation	Life Mobility support	Disability center	Individual facility	Total
3	1	7	3	0	1	3	1	1	5	2	27

2.4. Gangneung City Disability Status

2.4.1. Registered Disabled Individuals in Gangneung

Over the past 5 years, the total number of registered disabled individuals nationwide, in Gangwon Province, and in Gangneung City has shown a slight increase each year. The proportion of disabled individuals registered in Gangwon Province over the past 5 years is approximately 3.88% to 3.94% compared to the national total. Meanwhile, Gangneung City's proportion of registered disabled individuals over the same period is approximately 0.51% to 0.52% compared to the national total and about 13.17% to 13.30% compared to Gangwon Province, showing little significant variation annually.

Table 6: Number of Registered Disabled Persons in South Korea, Gangwon Province, and Gangneung City Over the Past 5 Years (Unit : People)

Classification	2016	2017	2018	2019	2020
Nationwide	2,511,051	2,545,637	2,585,876	2,618,918	2,633,026
Gangwon	98,928	99,959	100,693	101,484	101,615
Percentage compared to the national average	(3.94)	(3.93)	(3.89)	(3.88)	(3.86)
Gangneung	13,031	13,293	13,373	13,464	13,506
Percentage compared to the national average	(0.52)	(0.52)	(0.52)	(0.51)	(0.51)
Percentage compared to the Gangwonl average	(13.17)	(13.30)	(13.28)	(13.27)	(13.29)

2.4.2. Types of Disabilities Registered in Gangneung City

As of the end of 2020, when examining the number of registered disabled individuals in Gangneung City by type of disability, the highest proportion was observed in physical disabilities, with 6,505 individuals, accounting for 48.16% of the total. Following that, hearing impairments were recorded at 1,980 individuals, representing 14.66% of the total. In the case of brain disorders, there were 1,220 individuals, accounting for 9.03% of the total, ranking fourth after visual impairments.

Table 7: Registered Disabled Persons by Disability Type in Gangneung City (As of the End of 2020)

Disability	People	(%)
Physical	**6,505**	**48.16**
Visual	1,293	9.57
Auditory	1,980	14.66
Speech	110	0.81
Intellectual	1,036	7.67
Brain injury	**1,220**	**9.03**
Autism	110	0.81
Mental/Psychiatric	494	3.66
Renal/Kidney	445	3.29
Etc	313	2.34
Total	**13,506**	**100.00**

2.4.3. Registration Status of Individuals with Physical and Brain Disorders in Gangneung City Over 5 Years (2016-2020)

Over the five-year period from 2016 to 2020, the number of individuals registered with physical disabilities in Gangneung City showed a decreasing trend annually. Particularly, the proportion of physical disabilities was highest at 49.87% among all types of disabilities. On the other hand, when examining the registration numbers of individuals with brain disorders in Gangneung City over the same period, it was observed that the highest number was recorded in 2017 at 1,236 individuals. However, thereafter, there was little change, and the proportion of brain disorders among all types of disabilities was 9.19%. Additionally, analyzing the changes in the proportion of physical disabilities in Gangneung City over the past five years (2016-2020), it was observed that the number of registrations for physical disabilities showed a gradual decrease. In 2020, there was a decrease of -1.17% compared to 2019. Conversely, there was little change in the proportion of brain disorders, which remained consistent between 2019 and 2020.

Table 8: Registrations for Physical and Brain Disorders in Gangneung Over the Past 5 Years (Unit : People)

Year	2016	2017	2018	2019	2020	Total	2016 -2020 (%)	2019 (%)	2020 (%)	growth rate from 2019
Physical	6,780	6,741	6,640	6,582	6,505	33,248	49.87	48.89	48.16	-1.17%
Brain injury	1,229	1,236	1,224	1,220	1,220	6,129	9.19	9.06	9.03	0.00%
Total	**13,031**	**13,293**	**13,373**	**13,464**	**13,506**	**66,667**				

3. Research Methodology

3.1. Survey Participants

For the study on establishing a public health-medical cooperation system for rehabilitation medical services for people with disabilities in Gangneung area, a total of 30 individuals with physical and brain disorders registered in Gangneung area as of the end of 2020 were selected as the survey participants. During the survey period (December 20, 2021, to December 31, 2021), due to the environment of avoiding direct contact between people amid the spread of the COVID-19 Omicron variant, it was not possible to select many survey participants. Therefore, the survey was conducted with 24 valid questionnaires. While disability is not inherently linked to increased risk of getting COVID-19 infection or experiencing more severe disease, factors or circumstances associated with disabilities may increase these risks (Boyle et al., 2020; Kim et al., 2021). Survey participants were selected from individuals with disabilities who could respond to the survey by visiting various disability welfare facilities registered in Gangneung city.

3.2. Overview of Survey and Statistical Analysis Methods

Physical disability refers to disabilities such as amputation, joint disorders, physical functional disorders, and deformities. Brain disorders refer to complex disabilities caused by brain damage, classified as stroke, cerebral palsy, and traumatic brain injury, often accompanied by comorbidities. Since individuals with physical and brain disorders find rehabilitation challenging on their own, medical services provided are crucial. Therefore, the survey items were designed to investigate the most efficient rehabilitation medical services. The survey items included general information on demographic and sociological characteristics of the survey participants (12 items), disability characteristics (8 items), health status and utilization of health care services (13 items), and quality of life and demand for health care services (13 items), totaling 46 items. Frequency analysis and cross-analysis were conducted.

4. Research Findings

4.1. Overview of Survey Results

Data processing was conducted on the final valid sample collected from the survey. Data analysis involved editing to verify errors and omissions in the survey records, coding to encode survey responses, and data cleaning to identify data errors. The data were analyzed using IBM SPSS Statistics 22.0 software, focusing on 24 valid samples out of a total of 30. The reliability coefficient Cronbach's α value was very high at R=0.86.

4.2. Analysis of Survey Results

4.2.1. Demographic and Sociological Characteristics of Survey Participants

The average monthly income of all participants in the past year was 3.323 million won, with incomes ranging from a minimum of 0 won to a maximum of 25 million won.

Table 9: Characteristics of Survey Participants

Classification		People	(%)
Total		24	100.0
Residence	Dong	14	58.3
	Eup/Myeon	10	41.7
Age (years old)	0~9	0	0.0
	10~19	0	0.0
	20~29	6	25.0
	30~39	3	12.5
	40~49	5	20.8
	50~59	5	20.8
	60~69	4	16.7
	70 above	1	4.2
Gender	Male	19	79.2
	Female	5	20.8
Education	No education	0	0.0
	Elementary school	2	8.3
	Middle school	3	12.5
	High school	9	37.5
	Community/Technical college	3	12.5
	University	5	20.8
	Graduate school	0	0.0
	etc	2	8.3
Occupation	Manager	1	4.2
	Professionals and related workers	1	4.2
	Office clerks	0	0.0
	Service workers	4	16.7
	Sales workers	0	0.0
	Agricultural, forestry, fishery workers	0	0.0
	Skilled workers	0	0.0
	Equipment/machinery assemblers	0	0.0
	Unskilled laborers	0	0.0
	Military personnel	0	0.0
	Student	2	8.3
	Homemaker	1	4.2
	Unemployed	12	50.0
	Etc	3	12.5
Marriage	Single	16	66.7
	Married	8	33.3
	Separated	0	0.0
	Divorced	0	0.0
	Widowed	0	0.0
	Cohabiting	0	0.0
Number of household members	1	7	29.2
	2	3	12.5
	3	6	25.0
	4	4	16.7
	5 above	4	16.7
Economic condition	Vero poor	4	16.7
	Poor	5	20.8
	Fair/Moderate	13	54.2
	Good	2	8.3
	Very Good	0	0.0
Basic	Yes	10	41.7

livelihood	No	14	58.3
Type of health insurance	National Health Insurance (Employer)	9	37.5
	National Health Insurance (Residence)	4	16.7
	Medical aid	11	45.8
Private insurance	Yes	16	66.7
	No	8	33.3

4.2.2. Disability Characteristics

4.2.2.1. Types and Severity of Disabilities

Among the total 24 survey respondents, 6 individuals (25.0%) reported having a "physical disability," while 18 individuals (75.0%) reported having a "brain disorder." Regarding the severity of disabilities among all respondents, 4 individuals (16.7%) reported having "mild disabilities," and 20 individuals (83.3%) reported having "severe disabilities." Among the 6 individuals with physical disabilities, 2 individuals (33.3%) reported having "mild disabilities," and 4 individuals (66.7%) reported having "severe disabilities." Among the 18 individuals with brain disorders, 2 individuals (11.1%) reported having "mild disabilities," and 16 individuals (88.9%) reported having "severe disabilities." Comparing the findings of this survey to the data on physical and brain disorders in Gangneung as of the end of 2020, it can be observed that while there was a slight discrepancy in the case of physical disabilities, there was a similarity in the prevalence of "severe disabilities" compared to "mild disabilities" in the case of brain disorders.

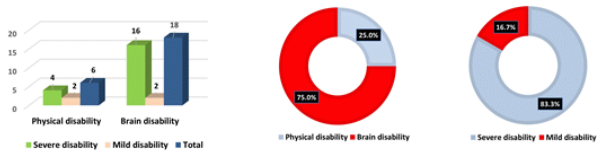

Figure 1: Number and Percentage of Disability Types and Severity Levels (Unit: Persons, %)

4.2.2.2. Onset of Disability

When examining the onset of disabilities among the total 24 survey respondents, it was observed that 5 individuals (20.8%) reported the onset as "pre-birth (congenital)" and "aged 20-29," followed by 4 individuals (16.7%) reporting the onset after "age 3." Among the 6 individuals with physical disabilities, the onset of disabilities was reported by 2 individuals (33.3%) in the age range of "7-14" and "15-19," and by 1 individual (16.7%) each in the age ranges of "20-29" and "30-39." Among the 18 individuals with brain disorders, the onset of disabilities was reported by 5 individuals (27.8%) as "pre-birth (congenital)" and by 4 individuals (22.2%) each after "age 3" and in the age range of "20-29," totaling 9 individuals (50.5%) reporting onset as "pre-birth (congenital)" or after "age 3."

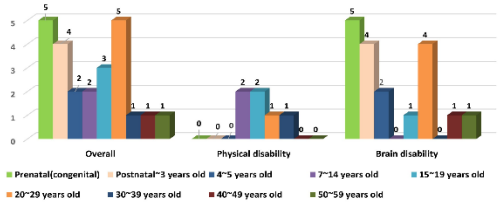

Figure 2: Occurrence Timing of Disabilities (Unit: Persons)

4.2.2.3. Main Causes and Diagnostic Names of Disability Onset

Among the total 24 survey respondents, the main causes of disability onset were "accident" for 8 individuals (33.3%) followed by "congenital" for 6 individuals (25.0%). Among the 6 individuals with physical disabilities, the main causes of disability onset were "accident" for 4 individuals (66.7%) and "disease" for 2 individuals (33.3%). Among the 18 individuals with brain disorders, the main causes of disability onset were "congenital" for 6 individuals (33.3%), "accident" for 4 individuals (22.2%), and "disease" for 3 individuals (16.7%). Among the total 24 survey respondents, the main diagnostic names of disability onset were "brain disorders (cerebral palsy, brain malformation, cerebral infarction, brain hemorrhage, etc.)" for 10 individuals (41.7%) followed by "poliomyelitis" for 7 individuals (29.2%). Among the 6 individuals with physical disabilities, the main diagnostic names of disability onset were "poliomyelitis" for 3 individuals (50.0%) followed by "fracture" for 2 individuals (33.3%).

Among the 18 individuals with brain disorders, the main diagnostic names of disability onset were "brain disorders (cerebral palsy, brain malformation, cerebral infarction, brain hemorrhage, etc.)" for 10 individuals (55.6%) followed by "poliomyelitis" for 4 individuals (22.2%).

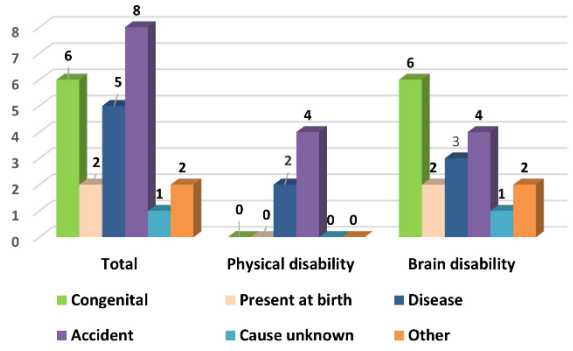

Figure 3: Main Causes of Disability Occurrence (Unit: Persons)

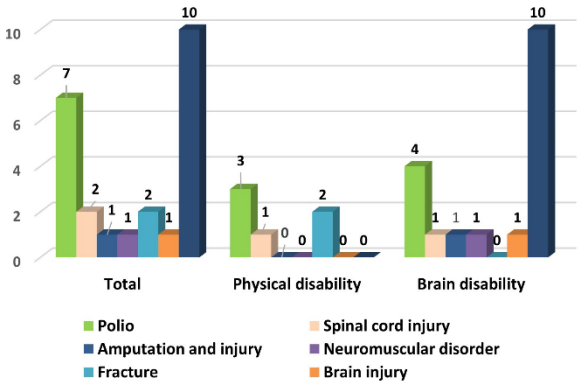

Figure 4: Primary Diagnoses of Disabilities (Unit: Persons)

4.2.3. Health Status and Utilization of Health Care Services

4.2.3.1. Health Status in the Past Year

Among the total 24 respondents, the overall health status including physical and mental health in the past year was surveyed. The results showed that "fair" was reported by 12 individuals (50.0%), followed by "very poor" by 6 individuals (25.0%), indicating that 75% of the respondents rated their overall health status as fair or worse. Among the 6 respondents with physical disabilities, "very poor" was the highest at 3 individuals (50.0%), while among the 18 respondents with brain disorders, "fair" was the highest at 10 individuals (55.6%), followed by "poor" by 4 individuals (22.2%).

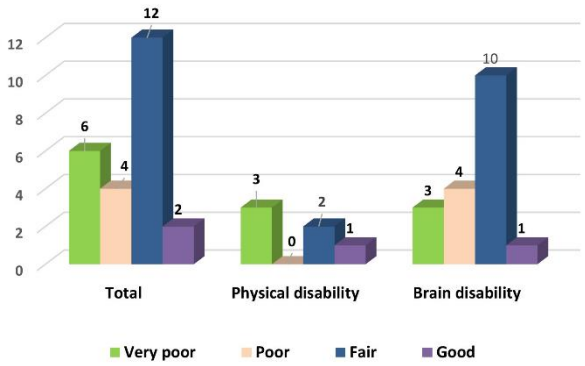

Figure 5: Overall Health Status in the Past Year (Unit: Persons)

4.2.3.2. Presence of Chronic Conditions

Out of the total 24 respondents, the presence of chronic conditions lasting for more than 3 months was surveyed. The results showed that "yes" was reported by 14 individuals (58.3%), while "no" was reported by 10 individuals (41.7%), indicating a relatively high prevalence of chronic conditions. Among the 6 respondents with physical disabilities, "yes" was reported by 4 individuals (66.7%), while "no" was reported by 2 individuals (33.3%). Among the 18 respondents with brain disorders, "yes" was reported by 10 individuals (55.6%), while "no" was reported by 8 individuals (44.4%).

Figure 6: Presence of Chronic Conditions (Unit: Persons)

4.2.3.3. Chronic Conditions and Diseases

Out of the total 24 respondents, for the 14 individuals who reported having chronic conditions, a multiple-choice survey regarding chronic conditions and diseases yielded a total of 30 responses. Among these, "others" accounted for 7 cases (23.3%), followed by "high/low blood pressure" with 5 cases (16.7%).

Table 10: Response Results for Chronic Conditions and Diseases (Unit: Person, %)

Diseases	Total	(%)	Physical	(%)	Brain injury	(%)
Hypertension /Hypotension	**5**	**16.7**	**2**	**25.0**	**3**	**13.6**
Arthritis	3	10.0	1	12.5	2	9.1
Diabetes	3	10.0	1	12.5	2	9.1
Lower back pain	1	3.3	0	0.0	1	4.5
Hyperlipidemia	1	3.3	0	0.0	1	4.5
Depression	**4**	**13.3**	1	12.5	**3**	**13.6**
Angina	1	3.3	0	0.0	1	4.5
Myocardial infarction	1	3.3	0	0.0	1	4.5
Stroke	2	6.7	0	0.0	2	9.1
Thyroid disorder	1	3.3	1	12.5	0	0.0
Asthma	1	3.3	0	0.0	1	4.5
Etc	**7**	**23.3**	**2**	**25.0**	**5**	**22.7**
Total	30	100.0	8	100.0	22	100.0

For individuals with physical disabilities, out of the 4 respondents, there were a total of 8 multiple responses, with both "high/low blood pressure" and "other" each accounting for 2 cases (25.0%). Regarding individuals with brain disorders, out of the 10 respondents, there were a total of 22 multiple responses, with "other" accounting for 5 cases (22.7%), and both "high/low blood pressure" and "depression" each accounting for 3 cases (13.6%).

4.2.3.4. Reasons for Not Using Medical Services at Local Disability Health Centers

Out of the total 24 respondents, 15 individuals responded that they had not utilized health management and rehabilitation medical services at local disability health centers. The primary reasons for this were surveyed, with 9 individuals (60.0%) citing "not knowing about the center" and 6 individuals (40.0%) mentioning "knowing about the center but having a regular hospital." Among respondents with physical disabilities, out of the 4 individuals, 3 (75.0%) mentioned "not knowing about the center," while 1 (25.0%) mentioned "knowing about the center but having a regular hospital." For individuals with brain disorders, out of the 11 respondents, 6 (54.5%) stated "not knowing about the center," while 5 (45.5%) mentioned "knowing about the center but having a regular hospital."

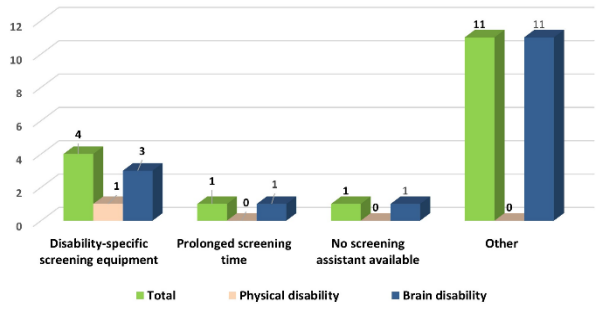

Figure 7: Reasons for Not Receiving Certain Examination Items (Unit: Count)

4.2.3.5. Reasons for Not Receiving Sufficient Rehabilitation Medical Services in the Past Year

Out of the total 24 respondents, the primary reasons for not receiving sufficient rehabilitation medical services despite needing them in the past year were surveyed. Results showed that 9 individuals (37.5%) responded with "did not feel the need for the service," while 4 individuals (16.7%) mentioned "difficulty in transportation" as the main reasons. Among respondents with physical disabilities, out of the 6 individuals, 3 (50.0%) cited "did not feel the need for the service," while 2 (33.3%) mentioned "lack of information" as primary reasons. For individuals with brain disorders, out of the 18 respondents, 6 (33.3%) stated "did not feel the need for the service," while 3 (16.7%) each mentioned "difficulty in transportation," "lack of specialized personnel for people with disabilities," and "other reasons." The "other reasons" included responses such as "too expensive."

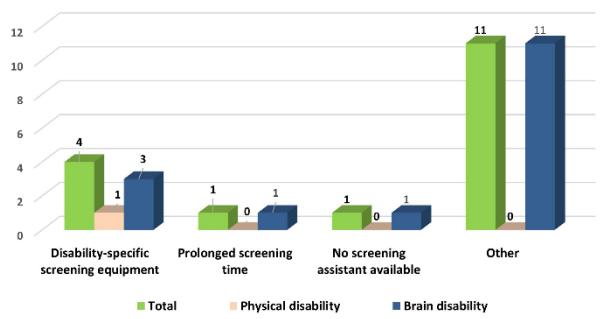

Figure 8: Reasons for Not Receiving Certain Examination Items (Unit: Count)

Table 11: Main Reasons for Not Using Rehabilitation Medical Services (Response Results)

Main reason	Response	(%)	Physical	(%)	Brain injury	(%)
Not felt the need for medical services	4	9.1	2	25.0	2	5.6
Lack of awareness about rehabilitation medical services	1	2.3	0	0.0	1	2.8
Lack of facilities nearby	**9**	**20.5**	1	12.5	**8**	**22.2**
Unaware of the effectiveness of medical service	5	11.4	1	12.5	4	11.1
Pursued alternative methods	1	2.3	0	0.0	1	2.8
Financial burden	7	15.9	1	12.5	6	16.7
Being on a waiting list for treatment	4	9.1	2	**25.0**	2	5.6
Difficulty accessing services	**12**	**27.3**	1	12.5	**11**	**30.6**
Etc	1	2.3	0	0.0	1	2.8
Total	**44**	**100.0**	**8**	**100.0**	**36**	**100.0**

4.2.4. Quality of Life and Demand for Health Care Services

4.2.4.1. Current Life Satisfaction Index

A survey was conducted among the total of 24 respondents to assess the overall satisfaction index regarding their current life. The results showed a range from a minimum of 10 to a maximum of 100 out of 100 points, with an average score of 58.3 points. Among respondents with physical disabilities, out of the 6 individuals, the scores ranged from a minimum of 10 to a maximum of 90 out of 100 points, with an average score of 60.0 points. For individuals with brain disorders, out of the 18 respondents, the scores ranged from a minimum of 30 to a maximum of 100 out of 100 points, with an average score of 57.2 points.

Table 12: Life Satisfaction Index (Unit: point)

Satisfaction index	Overall	Physical	Brain injury
Minimum score	10	10	30
Maximum score	100	90	100
Average	**58.3**	**60.0**	**57.2**

4.2.4.2. Experiences lasting more than one week in the past year

A multiple-response survey was conducted among the total of 24 respondents to inquire about experiences lasting more than one week in the past year. The results revealed a total of 47 occurrences, with 'stress' comprising 11 instances (23.4%), followed by 'depression' and 'joy and happiness,' both with 9 instances (19.1%). Among individuals with physical disabilities, out of the 6 respondents, a total of 14 occurrences were reported, with 'depression,' 'stress,' and 'joy and happiness' each comprising 3 instances (21.4%). For individuals with brain disorders, out of the 18 respondents, there were a total of 33 occurrences, with 'stress' comprising 8 instances (24.2%), followed by 'depression' and 'joy and happiness,' both with 6 instances (18.2%).

Table 13: Experiences Lasting Over a Week in the Past Year

Experienced	Overall	(%)	Physical	(%)	Brain injury	(%)
Never experienced	7	14.9	2	14.3	5	15.2
Sadness	5	10.6	1	7.1	4	12.1
Despair	3	6.4	1	7.1	2	6.1
Depression	9	19.1	3	21.4	6	18.2
Suicidal thoughts	3	6.4	1	7.1	2	6.1
Stress	**11**	**23.4**	**3**	**21.4**	**8**	**24.2**
Joy and happiness	**9**	**19.1**	**3**	**21.4**	**6**	**18.2**
Total	**47**	**100.0**	**14**	**100.0**	**33**	**100.0**

4.2.4.3. Difficulty in communication when using everyday language

A survey conducted among the total of 24 respondents revealed contrasting responses regarding the difficulty in communication when using everyday language. Out of these respondents, 10 individuals (41.7%) reported 'extreme difficulty,' while 7 individuals (29.2%) reported 'not difficult at all' as their experience. Among individuals with physical disabilities, out of the 6 respondents, 3 individuals (50.0%) reported 'not difficult at all,' while 2 individuals (33.3%) reported 'extreme difficulty,' showing contrasting responses. For individuals with brain disorders, out of the 18 respondents, 8 individuals (44.4%) reported 'extreme difficulty,' while 'slight difficulty' and 'not difficult at all' were both reported by 4 individuals (22.2%), indicating varied experiences.

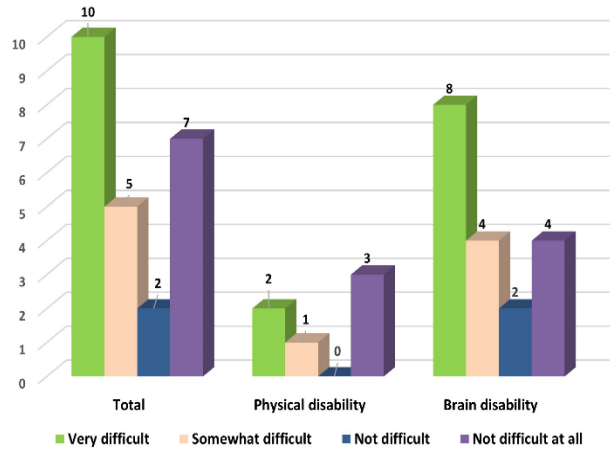

Figure 9: Difficulty in Everyday Language Communication (Unit: persons)

4.2.4.4. The necessity of rehabilitation medical services for enhancing functionality and abilities

A survey conducted among the total of 24 respondents revealed the perceived necessity of rehabilitation medical services for improving physical, mental, and social capabilities among individuals with disabilities. Out of these 'not necessary at all' were each reported by 1 individual (16.7%). For individuals with brain disorders, out of the 18 respondents, 12 individuals (66.7%) stated that such services are 'extremely necessary,' while 5 individuals (27.8%) indicated that they are 'generally necessary.'

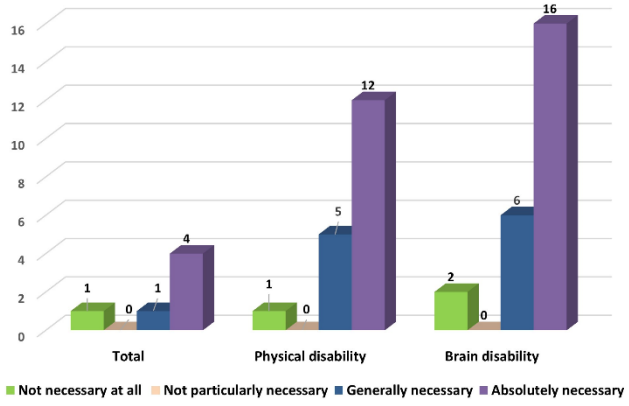

Figure 10: Need for Rehabilitation Medical Services (Unit: persons)

5. Conclusions and Policy Recommendations

Individuals with disabilities face various health issues, including secondary disabilities and comorbidities, depending on the type and severity of their disability. They are particularly at risk of secondary disabilities due to primary disabilities, high vulnerability to age-related health problems, increased risk of health-threatening behaviors, exposure to violence, unintended injuries, etc. Additionally, individuals with disabilities often experience unmet healthcare needs, which refers to the state where necessary healthcare services are not received in a timely manner despite being required. Mental health care use and perceived unmet needs vary depending on the type of disability.

Given the geographical characteristics of Gangwon Province and Gangneung area, which are characterized by many mountainous regions and relatively few medical institutions, close coordination among regions and institutions is crucial for disability services. In terms of regional services, for example, in rehabilitation therapy during the recovery phase, patients should be evaluated regularly to determine the need for ongoing rehabilitation therapy for up to six months after the onset of illness, with the possibility of extending the duration depending on the degree of recovery. As for institution-provided services, Gangwon University Hospital, as a regional responsible medical institution, should collaborate with Gangwon Province Rehabilitation Hospital to provide prompt acute rehabilitation services. Additionally, in cooperation with this service, Gangneung Asan Hospital, as a comprehensive hospital, should ensure that rehabilitation therapy services continue for a certain period in both the acute and recovery phases, and collaborative services such as treatment information and referrals for rehabilitation patients are provided according to the degree of functional recovery. In cases of severe functional impairment, continuous screening processes are needed to determine whether the patient is in a state of maintaining medical care or in need of recovery, alongside the onset of whole-body recovery before six months after the onset of illness.

Policy recommendations for building a primary care institution-responsible medical institution rehabilitation service coordination system include the development and education of guidelines for appropriately classifying patients in need of rehabilitation services, alongside capacity-building networks. Especially to promote the integration of community living for individuals with traumatic brain injuries, continuous medical rehabilitation services should enhance daily living independence, activate vocational rehabilitation to expand employment opportunities and increase income levels, and raise family support through home support programs.

Granting administrative and financial authority to disability support centers, restructuring of the public institution, preparation for a central role in the reorganization of the entire social welfare supply system, research and feedback system establishment for locality implementation, and expansion of financial support through voucher-based financial support are essential. Thus, the development, distribution, and education of classification system guidelines reflecting the type of disability, severity, and demand of patients should precede, and an emergency transfer network for individuals with disabilities should be established by setting up a classification system by disease severity for proper hospital transfer. Understanding the current status of emergency use and available resources for individuals with disabilities, establishing emergency safety services regional centers, and building cooperative systems between fire departments and medical institutions are necessary. In particular, for home-bound individuals with severe disabilities, it is necessary to establish a referral system for customized home rehabilitation services tailored to the needs of the target population and to provide customized home rehabilitation services. To do so, a network for identifying and referring individuals with severe disabilities in the local community, as well as a referral-coordinated patient rehabilitation needs diagnosis and home rehabilitation program provision between public health center medical staff and responsible medical institutions' rehabilitation medicine specialists, should be established in advance.

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