

Pioneering Chronic-phase Rehabilitation and Nutritional Management in Cambodia, the Lao People's Democratic Republic, and Viet Nam:

Promotion of a Broad-based Healthcare System

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Promotion of a Broad-based Healthcare System**

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Chapter 1. Introduction

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Chapter 2. Practice of Chronic-phase Rehabilitation and Homecare

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3.2. Nutritional support at hospitals in Cambodia, Lao PDR, and Viet Nam

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3.3. Capacity building of the human resources for nutritional management

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3.4. Other activities to promote nutritional management and healthy food

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Chapter 4. Conclusions and Recommendations

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Appendix 2. Training of chronic-phase rehabilitation personnel in Japan

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Appendix 3. Staff education and outreach activities

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Appendix 4. Stroke Care Conference in the Lao PDR 2019

Masaki Nishio, Yuuki Nishikawa, Syuusuke Matsumoto

Abbreviations and Acronyms

ADL	Activity of Daily Living
AHWIN	Asia Health and Wellbeing Initiative
ASEAN	Association of Southeast Asian Nations
BBS	Berg Balance Scale
BI	Barthel Index
BMI	Body Mass Index
CBR	Community-Based Rehabilitation
CFD	Complementary Feeding Diet
CT	Computed Tomography
ERIA	Economic Research Institute for ASEAN and East Asia
FIDR	Foundation for International Development Relief
GCS	Glasgow Coma Scale
GDP	Gross Domestic Product
HEHP	High Energy High Protein Diet
ICU	Intensive Care Unit
ISAPH	International Support and Partnership for Health
JETRO	Japan External Trade Organization
JICA	Japan International Cooperation Agency
Lao PDR	Lao People's Democratic Republic
MMSE	Mini-Mental State Examination
MMT	Manual Muscle Testing
MRI	Magnetic Resonance Imaging
mRS	Modified Rankin Scale
NGO	Non-governmental Organisation

NNS	National Nutrition Strategy
NPO	Non-profit Organisation
NST	Nutrition Support Team
OT	Occupational Therapist
PT	Physical Therapist
QOL	Quality of Life
ROM	Range of Motion
SDG	Sustainable Development Goal
SJH	Sunrise Japan Hospital Phnom Penh
SLP	Speech Language Pathologist
SUN	Scaling Up Nutrition
TENS	Transcutaneous Electrical Nerve Stimulation
TSMC	Technical School for Medical Care
UNICEF	United Nations Children's Fund
VF	Videofluoroscopic Examination
VINEP	Viet Nam Nutrition System Establishment Project
WHO	World Health Organization
YLD	Years Lived with Disability

Chapter 1

Introduction

The total population of the Association of Southeast Asian Nations (ASEAN) Member States has been steadily increasing from 165 million in 1950 to 669 million in 2020, and it is estimated to hit a peak of about 800 million by around 2060 (UNDESA, 2019). This demographic trend is caused by declining fertility rates and extended life expectancies, and ultimately results in population ageing.

Population ageing in ASEAN Member States is not uniformly taking place from state to state. As the most extreme case, the percentage of those aged 60 years or above in Singapore was about 21% in 2020 and is estimated to increase to as high as 40% in 2050. Amongst the three target countries of this study, Cambodia and the Lao PDR will show a similar trend for the percentage of the older population (60 years old or above): about 7% in 2020 to about 16% in 2050, whilst Viet Nam will have a higher share of older population: 12% in 2020 to 27% in 2050 (UNDESA, 2019).

Population ageing takes place as a result of social change, such as the urbanisation of lifestyles, income increases, and improvements in public health, etc. and as a natural consequence, people will have more chances to be affected by non-communicable diseases, such as hypertension, diabetes mellitus, strokes, and cancer, etc. Cardiovascular disease (CVD) is one of the major causes of disabilities (Institute for Health Metrics and Evaluation, 2018). Although the age-standardised mortality rate and years lived with disability (YLDs) caused by CVD per population steadily decreased from 1990 to 2019 globally, the total numbers of deaths and YLDs from CVD are increasing quickly because of the rapidly growing population of older people in the world (Roth et al., 2020).

The Government of Japan promotes the broad-based enhancement of healthcare, which covers a wide range of services and infrastructure aiming for realising active, healthy, and productive ageing, such as public health, community development, housing, urban planning, food and nutrition, information technology, medical services at hospitals, and long-term care at institutions as well as at home. This concept has been advocated in the Asia Health and Wellbeing Initiative (AHWIN), which was launched in 2016 and revised in 2018 (Government of Japan, 2018). This kind of multifaceted approach, as advocated in AHWIN, is indispensable for developing a sustainable healthcare system in societies that have unprecedentedly high proportions of an older population. In this study, this concept is referred to as the 'broad-based healthcare system'.

Given the rapid population ageing across Asia, Japan, as the most aged country in the world, is willing to work to create policies for coping with population ageing together with other Asian countries and has supported the Economic Research Institute for ASEAN and East Asia (ERIA) in promoting research and dialogue on population ageing in the region under the AHWIN. This report deals with the outcome of the second term of the project which was commissioned for Kitahara Group by ERIA. The second term started in August

2018 and ended in July 2019. The objective of the second-term project was to investigate the practice of chronic-phase rehabilitation services for patients of strokes and other brain injuries as well as the nutritional management systems of hospitals in Cambodia, the Lao PDR, and Viet Nam. Most of the patients in the chronic phase of stroke live at home, so the involvement of family, the communities, and unskilled caregivers is crucially important for their continuous rehabilitation. Nutritional management at hospitals as well as within families or communities is also essential for quick recovery and disease prevention. Both chronic-phase rehabilitation and nutritional management, which we focused on in the second term of the project, are considered as indispensable components of the 'broad-based healthcare system'.

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Chapter 2

Practice of Chronic-phase Rehabilitation and Homecare

2.1. Effect of chronic-phase rehabilitation

The extent and timing of post-stroke functional recovery differ between individual patients. However, marked recovery in function is observed within a few weeks of onset due to the improvement in cerebral oedema, the recovery of blood circulation in the penumbra, and brain plasticity. Rehabilitation plays an important role in this function recovery, and early intervention has been demonstrated to enable the maximisation of plastic reorganisation in the motor area (Barbay et al., 2006).

The recovery in function is said to reach a plateau at 4–6 months after onset, but the increase in efficiency of synaptic transmission induced by training (training-induced synaptic strengthening) is thought to sustain the strengthening of functions beyond 6 months (Swayne et al., 2008).

Patients with chronic-phase hemiplegia show improvement in muscle strength in the leg on the affected side (Ada, Dorsch, and Canning, 2006) and gait-related indices through leg muscle strengthening training and gait training (Dean, Richards, and Malouin, 2000; Marigold et al., 2005; Salbach et al., 2005). In addition, there are reports that suggest home-visiting rehabilitation to be more effective than outpatient rehabilitation (Young and Forster, 1992). However, the superiority and inferiority of these types of rehabilitation vary between reports (Lincoln et al., 2004).

In recent years, there have been reports that have investigated the improvement in function for patients with chronic stroke through neural stem cell implantation (Kalladka et al., 2016), and meta-analysis on the effect of robotics in rehabilitation which revealed that the addition of training using robots in occupational therapy led to significant improvements in activities of daily living (ADL) and the motor function of the arm (Mehrholtz et al., 2018) and that the addition of training using robots in physical therapy did not lead to significant improvements in the gait speed or 6-minute walking distance, but did significantly increase walking independence (Lang et al., 2016). There is a lot of research being reported regarding this methodology.

With respect to quantitative response, the effect of task-specific training in the arm paralysis of patients with chronic stroke and hemiplegia could not be confirmed. However, intervention by rehabilitation based on community life is expected to slow the exacerbation of the disorder and encourage improvement in ADL and improvement in the instrumental activities of daily living (Pang et al., 2005; Outpatient Service Trialists, 2004; 2003). These findings suggest that tasks for rehabilitation should be set based on the activities of living and social roles, and the quality of the rehabilitation should be ensured rather than increasing the amount of training without considering the patient's background and movement in daily life.

2.2. Survey of the needs of chronic-phase rehabilitation and care of patients and family

(1) Subjects

Amongst patients who were admitted and treated in Cambodia (Sunrise Japan Hospital Phnom Penh), the Lao PDR (Mittaphab Hospital), and Viet Nam (Viet Duc University Hospital) between August 2018 and August 2019, 30 patients from each country diagnosed with apoplexy or head injuries and were dependent on care (modified Rankin Scale ≥ 4 at discharge) were targeted.

(2) Method

Basic information on those dependent on care was collected, and questionnaire on care for the primary caregiver was conducted.

Data on the following items were collected: age, gender, name of disease, and hospitalised duration for basic information; Barthel Index (BI) at admission, BI at discharge, and modified Rankin Scale (mRS) at discharge for the evaluation during hospitalisation; and the severity (mRS) 2–3 months after discharge. In the questionnaire survey conducted for the primary caregivers, questions regarding the current situation of care, the burden on the primary caregiver, and any needs related to caregiving were asked about (Table 2.1).

Regarding the methodology, information during hospitalisation was collected from hospital medical charts. For the questionnaire survey for primary caregivers, explanation was provided to them about the survey, and the response to the questionnaire was collected during the outpatient rehabilitation or home-visit rehabilitation. For the cases that did not receive outpatient rehabilitation or home-visit rehabilitation, information was collected by video telephone or telephone.

Table 2.1. Survey on rehabilitation and caregiving: questionnaire content

(i) Basic information		
	<i>Question content</i>	<i>Choices</i>
i-1	Relationship of the primary caregiver	Husband; wife; grandparent; sibling; child; grandchild; relative; non-relative
i-2	Age of primary caregiver	Age
i-3	Number of caregivers	1; 2; 3; 4 or more
i-4	Use of assistive device	Bed; wheelchair; cane; shower chair; handrail; none (multiple answers accepted)

i-5	Motive of primary caregiver regarding caregiving	I want to provide care because the person is family; whichever is fine; I want someone from outside to do it.
(ii) Content of caregiving and the amount of care		
	<i>Question content</i>	<i>Choices</i>
ii-1	What care is currently performed by the primary caregiver?	Meal assistance; excretion assistance; changing clothes; bathing/sponge bath; transfer; walking; medication/suction; communication (multiple answers accepted)
ii-2	What is the total time spent for providing care per day?	1–2 hours; within half a day; half a day; more than half a day; almost a whole day constantly.
ii-3	Is care provided at night?	Yes or No
(iii) Feelings of burden in caregiving		
	<i>Question content</i>	<i>Choices</i>
iii-1	Do you feel a burden in caregiving?	Yes or No
iii-2	Assistance is needed, and there is a physical burden.	Yes or No
iii-3	I feel physical fatigue due to caregiving.	Yes or No
iii-4	I can't provide assistance due to the severe condition of the patient.	Yes or No
iii-5	There is a mental burden due to difficulties in communication.	Yes or No
iii-6	The primary caregiver cannot be refreshed due to caregiving.	Yes or No
iii-7	I can't afford time for myself.	Yes or No
iii-8	Financial difficulties due to the caregiver not being able to work.	Yes or No

iii-9	Financial difficulties because I can't work due to caregiving	Yes or No
iii-10	Economic burden due to treatment costs.	Yes or No
(iv) Services wanted		
	<i>Question content</i>	<i>Choices</i>
iv-1	Where would you like care services to be carried out?	Home-visit care service, visit a social welfare facility service, hospitalisation service
iv-2	Service wanted	Nursing services (bedsore care, medication management), care service (care such as sponge bath), rehabilitation, entertainment such as travel, food service (prepared in consideration of food style and nutrition, etc.)

Source: Authors.

(3) Results

1) Basic information of the care dependent

In Cambodia and the Lao PDR, only stroke patients were taken as the respondents of this survey, whilst in Viet Nam, head injury patients were dominant. The average number of hospitalisation days was almost the same for the study countries at approximately 1 week. At the time of survey, more than half of the patients had a disability to a moderate degree (Table 2.2).

Table 2.2. Basic information of the patients

	Cambodia	Lao PDR	Viet Nam
Age	62.8±10.2	60.1±12.1	45.0±15.8
Sex (male/female)	16/14	14/16	23/7
Diagnosis	Infarction 23 Haemorrhage 7	Infarction 16 Haemorrhage 14	Haemorrhage 5 Traumatic brain injury 22 Tumour 3

Length of stay in hospital (days)		8.1±3.9	6.7±4.5	8.4±6.0
Barthel Index (at admission)		22.1±17.1	14.3±12.7	2.0±5.5
Barthel Index (at discharge)		30.0±20.2	23.5±15.3	19.0±19.3
Severity (at discharge)	mRS 3	3	0	0
	mRS 4	15	16	5
	mRS 5	12	14	25
Severity (at the time of the survey)	mRS 0	0	0	0
	mRS 1	0	6	0
	mRS 2	4	8	0
	mRS 3	6	8	2
	mRS 4	13	1	11
	mRS 5	7	7	17

Note: The number after the mark '±' indicates standard deviations.

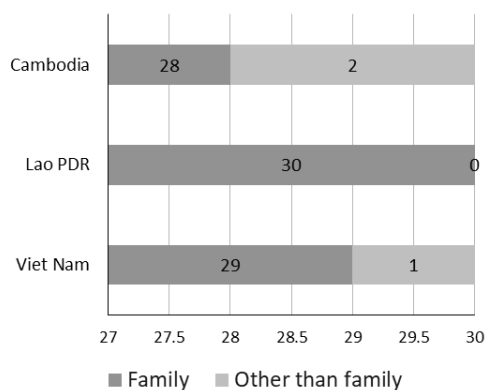
Source: Authors.

2) Care questionnaire results

Questionnaire (i). Basic information of the primary caregiver

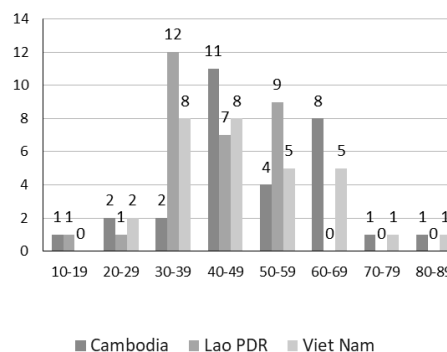
The concept that families should provide care even in cases with sequelae of serious disease is mainstream in all three countries. Regarding the relationship between the care dependent and primary caregiver, the family occupied a dominant position amongst the respondents (Figure 2.1). Regarding the number of caregivers, more than half of the respondents in Cambodia and the Lao PDR answered two or more. However, in Viet Nam, the results were 1–2 persons (Figure 2.3). Regarding the use of assistive devices, there was a higher use ratio of equipment related to transfer, such as canes, in Cambodia. In the Lao PDR and Viet Nam, there was a higher use ratio of equipment for less-active patients, such as beds and wheelchairs (Figure 2.4).

Figure 2.1. Relationship between the care recipient and the primary caregiver [N=30]



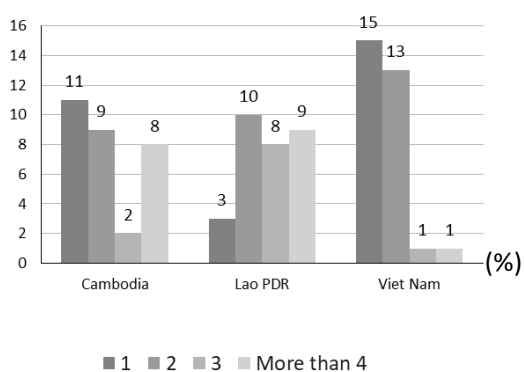
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Figure 2.2. Age of the primary caregiver [N=30]



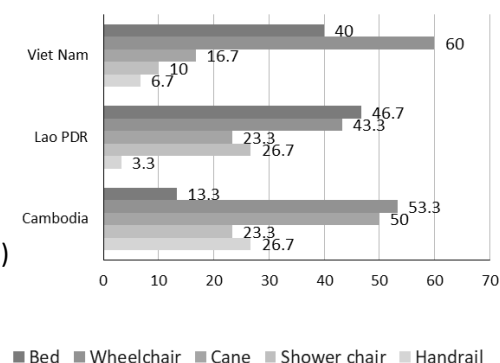
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Figure 2.3. Number of caregivers [N=30]



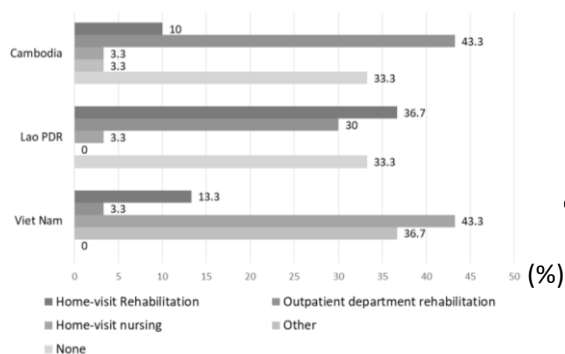
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Figure 2.4. Assistive device in use [N=30, multiple answers were allowed]



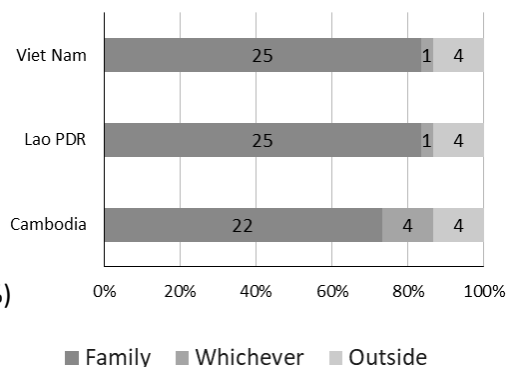
Source: Authors.

Figure 2.5. Ongoing care and rehabilitation services
[N=30, multiple answers were allowed]



Source: Authors.

Figure 2.6. Motive of main caregiver regarding caregiving
[N=30]

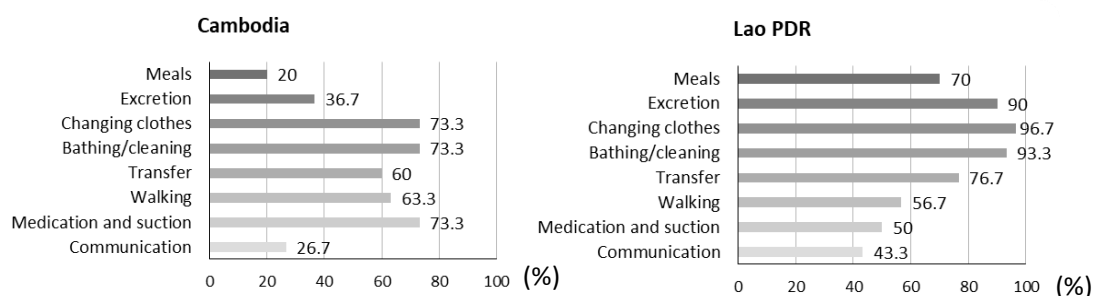


Source: Authors.

Questionnaire (ii). Types and time of care provided

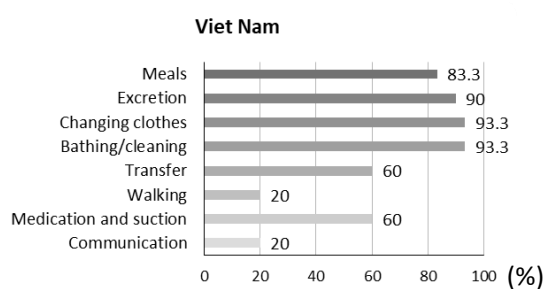
Many types of care for the activities of daily living were provided, such as changing clothes, bathing, and toilet activities, which were common in all three countries. In the Lao PDR, the majority of caregivers spent their time on caregiving from almost the whole day, including at night. In Cambodia, the implementation frequency of care for eating, an activity that is easily acquired even in severely ill patients, was lower (Figures 2.6, 2.7, and 2.8). Arranging the activities of daily living (ADLs) from the easiest to the hardest, the order would be dining, dressing, defecation/urination control, changing clothes, transferring, toileting, walking, bathing, and climbing the stairs. The low frequency of assistance in dining suggests that the patients and their families are able to live without over-assistance.

Figure 2.7. What care is currently performed by the main caregiver?
[N=30, multiple answers were allowed]



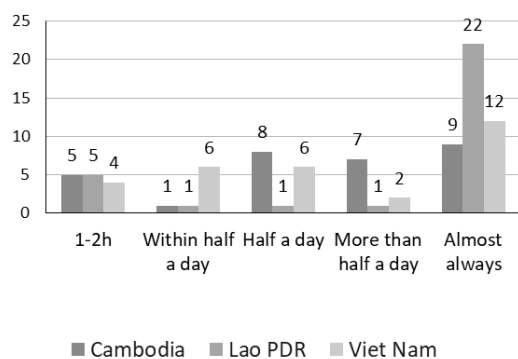
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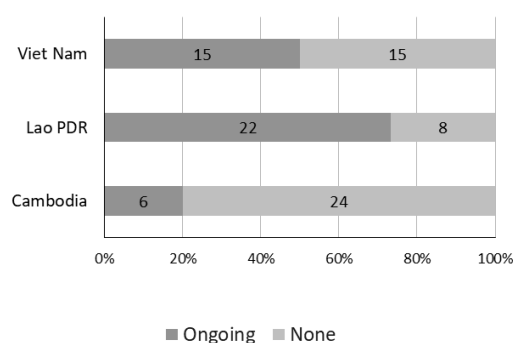
Source: Authors.

Figure 2.8. Time spent providing caregiving
[N=30]



Source: Authors.

Figure 2.9. Is care provided at night?
[N=30]

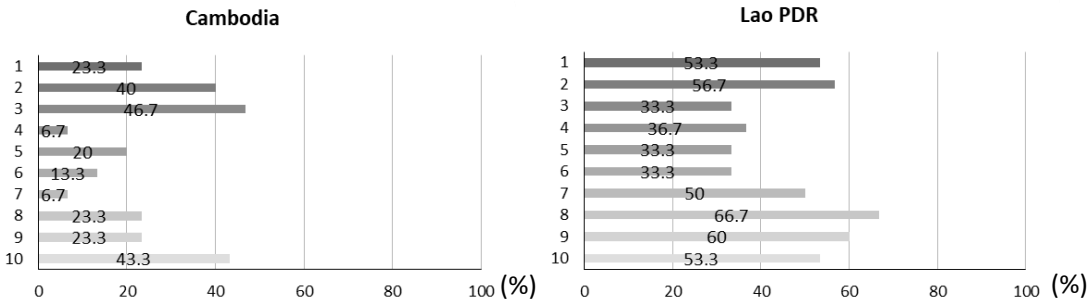


Source: Authors.

Questionnaire (iii). Feelings of burden in caregiving

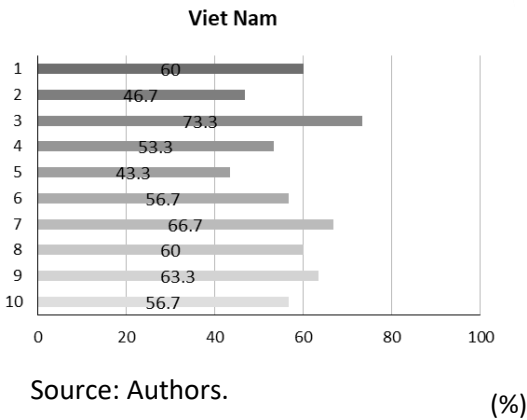
Regarding the burden of caregiving, many primary caregivers tended to complain of the physical and economic burden more than the mental burden.

Figure 2.10. Feelings of burden in caregiving
[N=30, multiple answers were allowed]



Source: Authors.

Source: Authors.

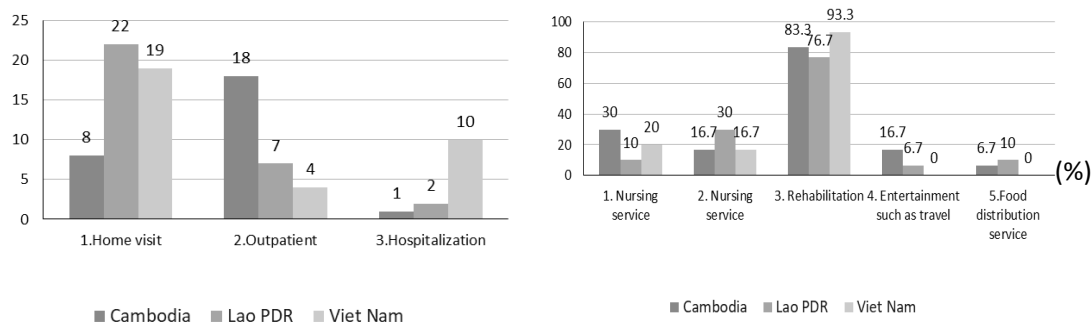


Source: Authors. (%)

Questionnaire (iv). Services wanted

The need for home rehabilitation was high, and so was the need for rehabilitation.

Figure 2.11. Service wanted
[N=30, Multiple answers were allowed]



Source: Authors.

Source: Authors.

(4) Summary

In accordance with the characteristics of the targeted facilities in the three countries, and because only severe cases with mRS4-5 at discharge were targeted, more than half of the patients needed care even 1 month after leaving acute-phase hospitals. Respondents in all three countries reported that care should be provided by the family. On the one hand, mental distress tended to be low even in cases where constant care was provided, but on the other hand, cases with heavy economic burden due to time-consuming care and limited opportunities to work were also observed.

Regarding patients discharged from Sunrise Japan Hospital Phnom Penh, Cambodia, and their families, a tendency for a higher rate of assistive device use and a lower burden in caregiving, including less caregiving at night, were observed. Regarding patients discharged from Mittaphab Hospital, Lao PDR, and their families, care was provided by more persons than the other two countries, and the time spent on caregiving, including night care, was longer. Regarding patients discharged from Viet Duc University Hospital, Viet Nam, most of them had only one or two caregivers, and outside services, such as home-visiting nurses, were used to reduce the burden. In the Lao PDR and Viet Nam, more support was provided for dressing, bathing including sponge baths, and feeding than in Cambodia.

2.3. Field survey on current practices of chronic-phase rehabilitation

To understand the actual situation of chronic-phase rehabilitation in Cambodia, the Lao PDR, and Viet Nam, we visited several hospitals that provide services for chronic-phase rehabilitation. Before our visits to hospitals, we obtained the permission with the cooperation of the ministries of health and related hospitals. We also visited pharmacies in the cities where the hospitals are located, to ask the availability of some equipment required for chronic-phase rehabilitation.

2.3.1. Cambodia

1) Rehabilitation professionals in Cambodia

Training for physical therapists began in 1987 at the Technical School for Medical Care (hereinafter referred to as TSMC). Currently, 15 students are enrolled each year. The school provides two courses: a three-year course for an associate degree and an additional two-year course for a bachelor's degree. Both curricula have lectures and clinical training. Cambodia does not have a national exam system for the qualification of physical therapists, but the graduates of the TSMC are automatically granted with the national qualification. There are no training facilities for occupational therapists or speech language pathologists (SLPs) in Cambodia. Physical therapists are expected to play various roles in Cambodia, such as in hospitals, physical therapist training schools, rehabilitation centres, facilities for persons with disabilities, private clinics, and soccer teams. In hospitals, physical therapists can be found in most national and provincial hospitals, but only few physical therapists can be found in regional hospitals and health centres. Since the establishment of the TSMC in 1994 until 2017, approximately 460 students have graduated, which makes 3 physical therapists per 100,000 population in Cambodia. Amongst them, only about 230 certified physical therapists practice physical therapy. As much as 60% of physical therapists working at referral hospitals do not practice physical therapy but engage in jobs other than rehabilitation for the following reasons: (1) lack of awareness of the necessity and importance of rehabilitation amongst medical staff, especially doctors, in referral hospitals; (2) lack of financial resources of referral hospitals to employ even a few rehabilitation staff; and (3) prioritisation of the employment of staff engaged in medical care, such as doctors or nurses, rather than physical therapists.¹

2) Field survey

a. Basic information of the visited province

Kratie Province is located approximately 260 km northeast of Phnom Penh. The area of the province is 11,094 km² and the population is 339,756 (Council for the Development of Cambodia, 2013). Kratie Province has one provincial referral hospital with 150 beds, 2 referral hospitals, 30 health centres, and 14 health posts. As for medical professionals, 37

¹ Information provided by Many San, General Secretary of Cambodia Physical Therapist Association.

physicians, 145 primary nurses, 186 secondary nurses, 134 primary midwives, and 114 secondary midwives work in the province.

b. Kratie Referral Hospital

The hospital was established in the 1950s, supported by France. Its bed capacity is 150, and the average bed occupancy rate is 96%. The hospital has the following departments: emergency, pharmacy, examination, rehabilitation, internal medicine, surgery, obstetrics and gynaecology, paediatrics, ophthalmology, otorhinolaryngology, and dentistry. It is equipped with an operating room, X-ray, and ultrasound scan. The total number of staff is 118, including 15 physicians (12 specialised physicians, 13 general physicians), 1 dentist, 5 medical assistants, 2 pharmacists, 42 nurses, 23 midwives, 1 accountant, 3 physical therapists, 3 prosthetists, and others. Table 2.3 shows the diagnoses and illnesses of outpatients and inpatients of Kratie Referral Hospital.

Table 2.3. Diagnoses of patients at Kratie Referral Hospital in 2018

Outpatients (20,006 cases in total)		Inpatients (11,567 cases in total)	
General diseases	1,563	Traffic accidents	1,253
Respiratory diseases	244	Respiratory diseases	942
Ophthalmology	363	General diseases	783
Diabetes	698	Obstetrics and gynaecology	322
Infectious diseases	231	Infectious diseases	367
Otorhinolaryngology diseases	156	High blood pressure	289
Dermatology	80	Otorhinolaryngology	188
High blood pressure	25	Ophthalmology	163
Traffic accidents	9	Diabetes	79
Obstetrics and gynaecology	2	Stroke	70

Source: Interviews of hospital staff by the authors.

Resources and services of chronic-phase rehabilitation in Kratie Referral Hospital

i. Personnel assignment

Three physical therapists and three prosthetists work in this hospital. Physical therapists are expected not only to provide rehabilitation services but also to support nurses. At the beginning of 2018, rehabilitation services were provided to approximately 35 outpatients each month. However, the priority of their responsibility has shifted from rehabilitation services to nursing support due to the shortage of nurses. In 2019, physical therapists only take on the role of nursing assistants and do not carry out any rehabilitation, but they still provide rehabilitation services outside the hospital as private business.

ii. Rehabilitation rooms and equipment

In 2000, a US non-governmental organisation (NGO) established a prosthetics room and had provided rehabilitation services. However, their support was suspended due to budget limitations at the time of our visit.

This hospital also has a rehabilitation room, which was established in the outpatient ward through support from the Red Cross in 2018, and three physical therapists have been assigned. This rehabilitation room is equipped with blood pressure meters, TENS, wheelchairs, weights, floor lamps for thermotherapy, two beds (one made by a physical therapist), crutches, and balance balls, etc.

iii. Patients receiving rehabilitation services

Physical therapists provide services mainly to patients with stroke, cerebral paralysis, or orthopaedic diseases, whilst prosthetists deal with patients with amputations, arthritis, clubfoot, broken bones, infantile paralysis, and stroke.

iv. Practices

Physical therapists do not provide rehabilitation services at the hospital as their duty; however, they carry out home-visit rehabilitation, mainly range of motion exercises, for two clients a day on average as their private business. They provide services 5–7 times a week per client.

These services are carried out upon request from the patients, except paediatric cases, for which doctors prescribe physical therapy and the cost is covered by aid agencies. The price of private home-visit rehabilitation was not confirmed at the site visit, but the normal price of private rehabilitation in Cambodia is equivalent to US\$10–US\$20 per service.

The clients are mainly patients who have just completed acute care at a national hospital, provincial referral hospital, or referral hospital and have returned home, but the services are usually completed within a month. The people who are in a chronic phase, however, are mainly taken care of by family members, even if they have sequelae of stroke.

v. Capacity building of physical therapists

Physical therapists working at the hospital participate in training sessions held by the

Cambodia Physical Therapy Association regularly in Phnom Penh. Costs like travel expenses are often sponsored by aid agencies.

c. Other services related to chronic-phase rehabilitation in Kratie Province

In Kratie Province, assistive devices for people who need chronic-phase rehabilitation, such as wheelchairs, side canes, or pick-up walkers, are not available at local pharmacies. In cases where a physical therapist suggests that they need such devices, they are required to order them from retailers in Phnom Penh.

2.3.2. Lao PDR

1) Rehabilitation professionals in the Lao PDR

Physical therapists working in the Lao PDR can be found only in ‘central hospitals’ and ‘provincial hospitals’. The University of Health Sciences in Vientiane is the only educational institution to create physical therapists in the country. Up to 2018, approximately 1,100 persons had graduated but only 200 persons were working as active physical therapists. At district hospitals, which are placed under central hospitals in the healthcare system of the Lao PDR, physical therapists work as nursing assistants due to a shortage of nurses.

2) Field survey

a. Basic information of the visited province

Champasak Province is the southernmost province in the Lao PDR with an area of 15,415 km² and a population of 694,000 (Japan International Cooperation Agency and KOEI Research and Consulting Inc, 2017). The province has one provincial hospital with 250 beds, 9 district hospitals, 75 healthcare centres, and 53 private clinics. There are 1,621 medical personnel in total in the whole province, comprised of 615 persons at provincial hospitals, 617 persons at district hospitals, and 389 persons at healthcare centres.

Table 2.4 shows the annual numbers of outpatients and inpatients depending on the diagnosed illnesses in all the public health facilities of Champasak Province in 2018.

Table 2.4. Diagnoses of patients in Champasak Province in 2018

Outpatients		Inpatients	
Thyroid diseases	63,567	Upper gastrointestinal diseases	10,339
Upper gastrointestinal diseases	45,268	Gynaecology and obstetrics	6,235
Fever	39,486	Thyroid diseases	5,639
Neurological diseases	15,333	Diarrhoea	3,638

Pneumonia	12,008	Pneumonia	2,308
Diarrhoea	11,103	Traffic accidents	2,197
Gynaecology related diseases	9,993	Lower gastrointestinal diseases	1,861
Eye diseases	7,317	High blood pressure	1,537
Otorhinolaryngology related diseases	5,897	External injuries	1,448
Lower gastrointestinal diseases	5,752	Dengue fever	1,234

Source: Interviews of hospital staff by the authors.

b. Champasak Provincial Hospital

The hospital is functioning as a referral hospital covering Champasak Province and three other surrounding provinces. The hospital has the facilities to perform operations, but most patients with severe symptoms are transferred to hospitals in Ubonratchathani and Bangkok, Thailand. 3,449 cases were transferred from district hospitals to Champasak Provincial Hospital in 2018, but patient information is not shared between hospitals. The means of transportation for patients to be transferred should be arranged by family members.

The hospital receives training students from the Champasak College of Health Science. The average length of stay in this hospital was 4 days, and the bed occupancy rate was 102% in 2018. The hospital has the following departments: emergency, outpatient, internal medicine, obstetrics and gynaecology, paediatrics, ophthalmology, otorhinolaryngology, infectious disease, dermatology, dentistry, clinical laboratory, rehabilitation, and radiology. It is equipped with an operating room, X-ray room, and ultrasound scanner. The total number of staff is 541, including 141 physicians, 181 nurses, 19 pharmacists, 15 medical laboratory technologists, 44 physicians affiliated with the administrative department, 141 contract workers and volunteers, 10 physical therapists, and 6 prosthetists. The annual number of patients was 65,558 and that of inpatients was 54,546 in 2018. According to their classification, 936 'major' operations, such as spinal surgery, surgery for fractures, etc. were carried out in 2018, whilst the number of 'intermediate' operations like appendectomies and caesarean sections was 791, and 2,496 'minor' operations, such as wound suturing, were performed in 2018.

Resources and services for chronic-phase rehabilitation in Champasak Provincial Hospital

– Rehabilitation room and equipment

The hospital has a rehabilitation ward that accepts patients to stay, as well as a prosthetic room and three rehabilitation rooms. Regarding devices for physical therapy, the hospital is equipped with electric therapy devices, hot packs, therapeutic ultrasound devices, a massage machine, treadmill, and ergometer.

– Patients receiving rehabilitation services

Rehabilitation services are provided for approximately 10 cases per day. In 2018, 2,670 sessions were provided as outpatient rehabilitation services, and 770 inpatients received the rehabilitation services, including patients in other wards than the rehabilitation ward. Amongst them, 24 outpatient cases and 11 hospitalised cases were patients of stroke. Back pain is the most common cause for rehabilitation. The rehabilitation ward accepts about 4–5 patients each month. Most of them stay in the ward for 2–3 days only and are then discharged home after the family receives advice on home care.

– Practices

Rehabilitation services are provided 30 minutes per session every day on weekdays. In severe cases, implementation is done even on Saturdays and Sundays. The hospital also provides home-visit rehabilitation services. Physical therapists implement physical therapy and provide guidance to the family members. The care to prevent bedsores, and contracture is performed by a nurse. The fee for the rehabilitation is KN15,000 per session for outpatients and KN30,000 per session for inpatients.

– Capacity building

Meetings and training sessions are carried out every 3 months by rehabilitation personnel, and healthcare personnel throughout the four provinces of the southern part of the Lao PDR are invited to these sessions.

c. Champasak District Hospital (Type A district hospital)

Type A district hospitals are placed under provincial hospitals in the healthcare system of the Lao PDR. Type A district hospitals have more capacity to provide medical services than Type B district hospitals, like the capacity to provide surgery requiring anaesthesia (World Health Organization, 2014). District hospitals of the Lao PDR are supposed to mainly provide services for childbirth, minor diseases, and chronic-phase diseases. Patients with intermediate or severe conditions, such as stroke patients, are transferred to provincial hospitals or Thailand.

Champasak District Hospital is located approximately 60 km south of the Pakse urban area. The patients of serious diseases are referred to Champasak Provincial Hospital or hospitals in Thailand. The hospital has 20 beds, and the average occupancy rate in 2018 was 67%. The hospital has consultation services for internal medicine, obstetrics and gynaecology, paediatrics, and dentistry. The hospital is equipped with an operating room, X-ray room and ultrasound scanner but does not have equipment for physical therapy. The staff of

the hospital comprises 3 consultant physicians (1 obstetrics and gynaecology, 2 home doctors), 8 general doctors, 25 nurses, 3 pharmacists, 2 medical laboratory technologists, 1 X-ray technologist, 1 dentist, and 1 physical therapist (working as a nurse assistant).

Major operations cannot be performed in this hospital, but the hospital did perform 27 intermediate operations and 423 minor operations in 2018. Three delivery cases were also handled in 2018.

This hospital does not provide rehabilitation services, although it has a rehabilitation room.

Table 2.5 shows the number of patients by the diagnosed illnesses at Champasak District Hospital in 2018.

Table 2.5. Diagnoses of patients at Champasak District Hospital in 2018

Outpatients		Inpatients	
Upper gastrointestinal diseases	5,835	Infectious diseases	1,401
Neurological diseases	2,182	Upper gastrointestinal diseases	955
Odontopathy	744	Lower gastrointestinal diseases	832
Fever	679	Gynaecology and obstetrics	561
Musculoskeletal disorders	607	Pneumonia	186

Source: Interviews of hospital staff by the authors.

d. Sanasomboun District Hospital (Type B district hospital)

This hospital has 15 beds and is located approximately 24 km northwest of Pakse. The construction of the currently used hospital was completed in 2010 with support from the Japanese government. Patients with serious conditions are referred to Champasak Provincial Hospital or hospitals in Thailand.

The average bed occupancy rate was 71% in 2018, and consultations for internal medicine, obstetrics and gynaecology, and dentistry are accepted. The hospital has seven physicians, five nurses, one pharmacist, and two medical laboratory technologists but no physical therapists are assigned. The hospital provides no rehabilitation services and has no rehabilitation equipment.

Table 2.6 shows the numbers of patients by their diagnosed illnesses at Sanasomboun District Hospital in 2018.

Table 2.6. Diagnoses of patients at Sanasomboun District Hospital in 2018

Outpatients		Inpatients	
Thyroid diseases	2,075 cases	Lower gastrointestinal diseases	413 cases
Upper gastrointestinal diseases	1,476 cases	Gynaecology	373 cases
Fever	1,170 cases	Thyroid diseases	261 cases
Neurological diseases	1,101 cases	Diarrhoea	117 cases
External injuries	296 cases	Pneumonia	95 cases

Source: Interviews of hospital staff by authors.

3) Limitations of rehabilitation and caregiving services in the Lao PDR

In the Lao PDR, rehabilitation is usually completed within a month after discharge from an acute care hospital. For orthopaedic patients, massages, etc. can be performed at physical therapy clinics in urban areas, but for patients with sequelae of stroke, caregiving and rehabilitation are mainly provided by the family. There are no home-visit nursing or home-visit caregiving services provided in the Lao PDR, but home-visit rehabilitation services are available.

At Champasak District Hospital, rehabilitation services for stroke patients in acute phase are not carried out, nor guidance on how to take care of stroke patients for the family, whilst both are provided in the provincial hospital. Home-visit rehabilitation after discharge is provided but is often completed within a short period.

2.3.3. Viet Nam

1) Rehabilitation professionals in Viet Nam

Viet Nam does not have national certification system for physical therapists that is regulated by the government. Practically, persons who have successfully completed 9 months of clinical training after graduating from training institutions of physical therapy are called physical therapists, but the law does not guarantee the exclusive use of the title 'physical therapist' to them. Even nurses can call themselves physical therapists and provide rehabilitation services if they have completed short-term training courses. The quality of rehabilitation services in Viet Nam varies greatly.

2) Field survey

a. Hai Duong Medical Technical University Hospital

Hai Duong Province is located in the Red River Delta, with a population of 1.9 million, 75% of whom live in rural areas (General Statistics Office of Viet Nam, 2020a). As of 2017, Hai Duong Province had 20 hospitals, with 4,175 patient beds in total, 1 regional polyclinic with 165 beds, 5 sanatoriums or rehabilitation hospitals with 75 beds, as well as 265 medical service units with 1,060 beds, excluding private establishments. Regarding the number of medical personnel, 1,061 physicians, 2,318 nurses, and 602 midwives were counted throughout the health establishments, excluding private ones in the province (General Statistics Office of Viet Nam, 2020a).

The hospital was established in 2007 and functions as an education hospital for the students of Hai Duong Medical Technical University to train to become health professionals, such as nurses, medical laboratory technicians, radiologic technologists, and physical therapists. At the time of our visit, the hospital had 230 patient beds, and the bed occupancy rate was 113%. Amongst the 35 doctors registered at the hospital, 30 doctors were traditional medicine practitioners. The number of nurses was 70–80, and most of them had been trained for rehabilitation practices. The hospital had departments of paediatrics, rehabilitation, and emergency, etc. and was equipped with a CT scan and ultrasound.

As a common practice in this hospital at the time of visit in June 2019, patients were encouraged to discharge 3–4 weeks after admission because the public medical insurance system does not cover long hospitalisation, but some patients had come back to the ward due to a lack of support for family care and the adjustment in living environment for patients after discharge.

Resources and services for chronic-phase rehabilitation in Hai Duong Medical Technical University Hospital

i. Rehabilitation personnel and equipment

In this hospital, 35 personal therapists (PTs), 4 or 5 occupational therapists (OTs), and 2 speech-language therapists (STs) provide rehabilitation services, including part-time staff. Most of the staff graduated from Hai Duong Medical Technical University. Some staff teach students at Hai Duong Medical Technical University.

The hospital was equipped with parallel bars (including a traction device) for physical therapy and an exercise device for upper limb exercises.

ii. Rehabilitation practices

Rehabilitation is provided for approximately 230–300 patients per month. About 20% of inpatients are stroke patients and about 40% of the clients of rehabilitation services are stroke patients. Most patients have already been treated at Viet Duc University Hospital in Ha Noi, Bach Mai Hospital in Ha Noi, or other general hospitals at their acute phases, including patients after brain surgery.

The services provided by PTs are physical therapy and guidance to the family on home rehabilitation and body position adjustment, etc. Services to prevent bedsores and muscle contracture are provided by nurses.

The fee for the services provided by the PTs, OTs, and STs is D400,000–D500,000 per session. This cost is not covered by the public medical insurance system, whereas the cost for hospital beds is covered.

c. Bac Giang Rehabilitation Hospital

Bac Giang Province is in the northeast region, with a population of 1.8 million, 89% of whom live in rural areas (General Statistics Office of Viet Nam, 2020b). As of 2017, Bac Giang Province had 15 hospitals, with 3,340 patient beds in total, 1 regional polyclinic with 150 beds, 3 sanatoriums or rehabilitation hospitals with 15 beds, as well as 230 medical service units with 1,150 beds, excluding private establishments. Regarding the number of medical personnel, 1,075 physicians, 1,487 nurses, and 323 midwives were counted throughout the health establishments, excluding private ones in the province (General Statistics Office of Viet Nam, 2020a).

The hospital was established in 1965 as a nursing station for the officials of the province. In 1976, the facility was upgraded into a nursing institute with 250 beds, and then in 1996, it was renamed into a centre for rehabilitation and nursing. In response to the modification of the organisational structure of rehabilitation facilities in the country and the province, the hospital was renamed to its current name in 2014. The hospital has 150 patient beds now, with 106 staff, including 31 doctors. Most of the staff have been trained for rehabilitation practices. The hospital is equipped with 4D ultrasound and a microwave thermotherapy machine, etc. and some of these apparatuses have been supplied by international NGOs. The hospital has five clinical departments, which are departments of examination, paediatrics, internal and traditional medicine, surgery and emergency, and rehabilitation (Bắc Giang Provincial Department of Health, n.d.).

Resources and services for chronic-phase rehabilitation in Bac Giang Rehabilitation Hospital

i. Rehabilitation personnel and equipment

The hospital has 20 PTs and 2 OTs. It is equipped with beds for rehabilitation, devices for thermotherapy, devices for electrical stimulation, ultrasound, parallel bars, devices for upper limb exercise, outdoor space for self-practice, and rehabilitation chairs which enable practice in a sitting position.

ii. Rehabilitation practices

The hospital provides rehabilitation services for outpatients as well as inpatients. The average daily number of patients who were provided with rehabilitation services was 220 for inpatients and 150 for outpatients in 2018. The length of one session is about 30 minutes, and the fee is D318,000–D545,000 per session. The provided services are range of motion practice, thermotherapy, electrotherapy, ultrasonic therapy, walking practice, guidance to families, body position adjustment, etc. The services to prevent bedsores and

muscle contracture are provided by nurses.

d. Common practices and limitations of rehabilitation and caregiving services in Viet Nam

The Ministry of Health of Viet Nam has established at least one rehabilitation hospital in each province throughout the country. Patients are usually transferred to local rehabilitation hospitals after completing treatment during the acute phase in major hospitals. Home-visit rehabilitation can be carried out by PTs, but it is not covered by social insurance system regulated by the Ministry of Health, and families are required to pay for such services from their own pockets. As for the home-visit services for chronic-phase patients, acupuncture and moxibustion are also provided by traditional practitioners.

Regarding the quality of rehabilitation, in urban areas, rehabilitation is actively carried out not only for orthopaedic patients but also patients of strokes, spinal injuries, and head injuries, and the services focus on the improvement of activities of daily living (ADL). In rural areas, however, services are limited to exercises on the bed, acupuncture, moxibustion, and massages, and the improvement of ADL is not well considered.

Lack of continuity from acute care to chronic care is another problem in Viet Nam. Acute care hospitals do not track patients after discharge. We found some patients who were discharged from Viet Duc University Hospital in Ha Noi but gradually lost the ability to walk after the discharge because of the lack of opportunities to receive appropriate rehabilitation services. Ordinary households in Viet Nam cannot afford to employ rehabilitation practitioners at home, nor do they have enough knowledge and skills as family caregivers. Viet Nam still has many issues related to improving chronic-phase rehabilitation.

2.4. Case studies of chronic-phase rehabilitation in the Kitahara style

Through this project, the Kitahara Group provided services for chronic-phase rehabilitation in Cambodia, the Lao PDR, and Viet Nam, but the practices were modified in accordance with the realities of each country. The clients of our services were patients who had been treated at Sunrise Japan Hospital Phnom Penh in Cambodia, Mittaphab Hospital in the Lao PDR, and Viet Duc University Hospital in Viet Nam. Amongst the clients who received the Kitahara-style services for chronic-phase rehabilitation, five cases of stroke or traumatic brain injury from each country will be shown in this section. Cases of both home-visit and outpatient rehabilitation are included.

2.4.1. Cases in Cambodia

Case C1. A bedridden case provided with swallowing rehabilitation at an outpatient clinic

[Present illness]

A female patient in her 80s. She suffered from a massive cerebral infarction about 6 months before her first consultation at Sunrise Japan Hospital. The patient was treated at a hospital in Cambodia for 10 days then transferred to a hospital in Viet Nam. She stayed there for 4 days for testing and treatment. She returned home from Viet Nam. Her conditions had been stable after her return, but due to her worsening level of consciousness, she was admitted to a national hospital in Cambodia and then transferred to Sunrise Japan Hospital. Severe pneumonia was observed when she first came to Sunrise Japan Hospital, and she was treated using a mechanical ventilator. She stayed at Sunrise Japan Hospital for about 60 days and left for home after her respiratory condition was confirmed as recovered.

[First examination at the Kitahara facility]

(See Appendix 1 for the indicators of examination)

GCS: E4 V1 M5, MMT (Left side): Upper Limb 0 - Lower Limb 3, mRS: 5, BI: 0/100.

No obvious paralysis of the tongue or soft palate could be seen, but facial weakness could be observed. Severe cognitive impairment was also detected.

[Problems before the Kitahara-style intervention]

The patient spent most of her time on her bed on the first floor of her home. The main caregivers were her daughter living together with her and a neighbour who is not a relative. The house was equipped with a reclining wheelchair, a medical aspirator, and a nursing bed. Because of her swallowing disorder, she was served special drinks containing a food thickener to increase the viscosity and special food which was mashed using a blender.

She was confined to her bed due to severe paralysis and a consciousness disorder. She had severe communication impairment both for expression and comprehension and had no social interaction except with her family. She was totally dependent on caregivers for her daily life, and such her status imposed a great physical, economic, and social burden on her caregivers.

[Kitahara-style intervention for chronic-phase rehabilitation]

Outpatient rehabilitation was provided once a week for 60 minutes each. Due to the massive lesion, her age, and the severe cognitive dysfunction, improvement of motor function could not be expected. We set two main goals when we started the intervention:

(1) improvement of the patient's consciousness level and (2) improvement of swallowing function so that the patient could enjoy oral food intake.

To achieve goal (1), we provided continuous standing training using an antigravity device. For goal (2), we provided indirect swallowing training, such as oral ice massage, facial and neck massage, as well as direct swallowing training using juices thickened with food thickeners and fruits. In addition, guidance and advice for the primary caregivers on practical methods for feeding at home were provided. A mobile phone video camera was used to record the eating situation at home, and the video was checked, and feedback was given to them at each rehabilitation session.

As we expected, the paralysis did not improve at all, nor did the consciousness level, but an improvement in responsiveness to family members was observed. As for her nutritional intake, she was totally dependent on nasogastric tube feeding before the Kitahara-style intervention (after the onset of stroke), but she regained oral intake three times a day at home, although she still needed tube feeding. She did not develop any complications like aspiration pneumonia after the start of the Kitahara-style training. Our intervention was conducted for about 6 months.

[Discussion]

The improvement in consciousness disturbance due to extensive cerebral infarction and cerebral haemorrhage may continue several months after onset. Even in cases where the recovery of physical and cognitive functions, i.e. where improvement in severe paralysis and higher brain dysfunction cannot be expected, it is possible to reduce the burden on caregivers by continuing the intervention for several months. In addition, we believe that our guidance and advice to the family caregivers contributed to risk reduction in the training of the swallowing function.

Case C2. A case of cerebellar and pontine infarction with severe ataxia

[Present illness]

A male patient in his 70s. ADLs were independent before the onset. He developed dizziness and vomiting at the first onset, which took place approximately 3 months before his first consultation to Sunrise Japan Hospital. After consultation at a local clinic, he was transferred to a national hospital for further examination. A magnetic resonance imaging (MRI) scan at the national hospital revealed a diagnosis of bilateral pontine and cerebellar infarction. He was then transferred to Sunrise Japan Hospital for specialised treatment. He stayed at the hospital for about 10 days and was discharged home with moderate paralysis and severe ataxia.

[First examination by Kitahara's chronic-phase rehabilitation team]

GCS: E4 V5 M6, MMT (Right side): Upper Limb 3 - Lower Limb 3 - Trunk Muscle 3, mRS: 4, BI: 50/100, MMSE: 23/30.

Neurological examination detected signs of cerebellar ataxia.

He could feed himself independently, and other ADLs were partially dependent.

[Problems before the Kitahara-style intervention]

He lived with his wife and son, but his wife was unable to provide intensive physical assistance to the patient. The main caregiver was his son. The house was equipped with a nursing bed, and he used a wheelchair and a walking frame.

The patient's son was still young and working, so he could not be at home the whole day to provide care to the patient. The patient was distressed that he was annoying and disturbing his son's work.

[Kitahara-style intervention of chronic-phase rehabilitation]

Outpatient rehabilitation was provided three times a week for 60 minutes each. We set two goals for the intervention in this case: (1) to improve mobility and (2) to develop self-care abilities, particularly to improve the required movement for toileting and bathing because these activities required the extensive support of caregivers. To achieve goal (2), we provided balance training in the standing position and practice of changing direction and dressing.

MMT scores were not improved throughout our intervention, but intention tremor, a symptom of ataxia, was reduced. We introduced and trained using a four-wheel rollator at home, and this enabled him to move within his house, particularly for toileting, only with minimal physical support, though his movement still required observation to ensure safety, and assistance to pull and tear off toilet paper was also needed. As a result of our intervention, he became confident to stay at home without the assistance of his son. This change reduced the family's anxiety and burden. Outside the house, however, he still needed a wheelchair.

[Discussion]

We believe that rehabilitation programmes are supposed to be focused on the needs of the patients and their families, and the goals of rehabilitation should be to increase the level of independence in self-care and to relieve the anxiety of the patients and their families. In this case, we discussed the goals of the programme with the patients and family members. Such a procedure is indispensable for any rehabilitation programme to achieve a positive outcome.

To expand the range of activities of the patients who have limited of physical functions, rehabilitation is not enough, but living environments should be modified into disabled-friendly communities or cities. In this case, the patient spent most of the time at home and just went out of the home when he visited the hospital for outpatient rehabilitation. Poor infrastructure for disabled people made it difficult for him to maintain social interaction within the community. On the streets in Cambodia, sidewalks are not well constructed nor maintained, and many physical barriers and steps that hinder the movement of disabled people can be found.

Case C3. A case of cerebral haemorrhage with sever aphasia

[Present illness]

A male patient in his 50s. ADLs were independent before the onset. He suffered from a left putaminal haemorrhage 1 month before his first consultation to Sunrise Japan Hospital and was transferred to a national hospital for craniotomy for hematoma removal. After staying at the National Hospital for about 20 days, he visited our outpatient rehabilitation. On the first outpatient visit, severe paralysis and severe aphasia were observed.

[First examination at the Kitahara facility]

GCS: E4 VA M6, MMT (Right side): Upper Limb 1 - Lower Limb Hip 1 - Knee 2 - Ankle 1 - Trunk Muscle 4, mRS: 4, BI: 50/100.

Global aphasia (severe impairment of both expressive and receptive language function) was observed. He could feed himself independently. He needed a wheelchair for moving, and transferring to and from the wheelchair required partial support.

[Problems before the Kitahara-style intervention]

The patient lived at home with eight family members, excluding himself. His wife was the main caregiver. He used assistive devices, such as a nursing bed and wheelchair.

Severe aphasia and severe paralysis seriously limited the patient's social inclusion. His salary used to be the main source of income for the family, so economic instability was one of the greatest concerns for them.

[Kitahara-style intervention of chronic-phase rehabilitation]

Outpatient rehabilitation was provided three times a week for 60 minutes each. The goals of this intervention were (1) improving mobility and (2) improving communication skills. An ankle foot orthosis was prescribed to achieve stability in walking. For goal (2), we collaborated with a Cambodian physical therapist to provide voice training, speech

training, language comprehension training, and reading and writing training. A Japanese SLP with expertise in rehabilitation for aphasia also joined the discussion on the practical interventions for this case through a web conference.

MMT improved from 1 to 2 in hip muscle strength and from 2 to 3 in knee muscle strength. The state of severe aphasia and little spontaneous speech had not changed, but language comprehension was seemingly improved a little bit, and we could see occasions when he attempted to respond to staff questions with gestures.

BI improved from 50 to 65, although mRS did not change from 4. Initially, the patient needed almost full assistance to walk, but he became able to walk with an ankle foot orthosis and cane if he was observed by somebody to ensure safety. Initially, he could walk continuously for only about 5 m, but after 1 month of rehabilitation, he became capable of walking about 200 m without complaining of fatigue. He could even go up and down stairs if somebody observed him after our intervention.

[Discussion]

The communication disorder caused by aphasia is one of the most stressful symptoms of stroke for patients and families. No training school for SLPs has been established in Cambodia, so the rehabilitation of aphasic patients caused by stroke and traumatic brain injury is a big challenge. Interventions by native speakers are essential for language-targeted rehabilitation, so the training of Cambodian experts on rehabilitation for aphasia is an urgent issue.

In this case, speech therapy was administered by a physical therapist who was a native Khmer language speaker with the supervision of a Japanese SLP through a web conference. Communication between the Japanese SLP and the Cambodian physical therapist was conducted in English, and the Cambodian physical therapist translated the training content proposed by the Japanese side into Khmer for the intervention. The difference in the pronunciation, writing, and grammatical systems of English, Japanese, and Khmer created difficulties in sharing the knowledge and skills of speech therapy between them, so the rehabilitation was conducted with a trial-and-error approach. Due to the severity of the patient's aphasia, the patient did not improve, unfortunately, but this case was a great opportunity to start developing a systematically established method of speech therapy in the Khmer language. Sunrise Japan Hospital offers remote lectures on rehabilitation for aphasic patients by Japanese SLPs for Cambodian physical therapists once a month.

Case C4. A mild stroke case with a strong emotional impact on the patient

[Present illness]

A 45-year-old male. Before the onset, he was an office worker in charge of administrative work using a computer. He could drive a car by himself for commuting. He had a stroke in

December 2016, resulting in left hemiparesis. He returned to work in February 2017 but could not work as before the onset, so he was assigned lighter jobs with shorter duty hours. The company arranged a driver for him to commute because he could no longer drive.

On 25 August 2017, the patient noticed numbness in his left hand and leg, and consulted Sunrise Japan Hospital.

[First examination at Sunrise Japan Hospital]

GCS: E4 V5 M6, MMT (Left side): Upper Limb 4 - Lower Limb 4, mRS: 2, BI: 100/100.

Left hemiparesis. Numbness in left arm and finger.

Grip strength: Right 38.5 kg, Left 28.2 kg.

[Problems before the Kitahara-style intervention]

He lived together with his wife and three children.

Even after suffering the stroke, he could have an independent life, but the mild left hemiparesis and walking instability remained, and they created anxiety. He returned to work 2 months after the onset, but he was assigned less responsible jobs. Although he was independent in his daily life, he lost confidence and motivation for social interaction because of his impaired physical functions, such as limited walking ability and incapability of driving.

[Kitahara-style intervention of chronic-phase rehabilitation]

When outpatient rehabilitation was started, we tried to strengthen his motivation to undergo the training, telling him that there was a good possibility of improvement, in consideration of his younger age and physical function at the initial examination and that continued rehabilitation is crucial to achieve the goals. We also encouraged him to imagine how his range of activities in life would be expanded if his function could be improved. When new complaints from him arose, like backache, we carefully explained the probable causes, treatment, and preventive measures.

The patient underwent outpatient rehabilitation twice a week for 1 hour per visit. As a result, his left grip strength increased from 28.2 kg to 31.0 kg and mRS improved from 2 to 1. Numbness decreased and only remained in the fingertips. Improvement was also achieved even mentally. After the Kitahara-style intervention, we could see his pleasant facial expression more often, and he had more opportunities to go out.

One year after the outpatient rehabilitation was started, the patient succeeded in going back to work. His next goal was driving, so we arranged special training items for him: finger motor coordination, endurance training, seating endurance training, and the

operation of lower limbs in the sitting position. To achieve such goals, it is indispensable to increase the abilities of keeping attention and the judgment of surrounding situations during driving. As a result, the patient became capable of driving again and eventually accomplished his goal of commuting by driving his own car.

When the goals of our intervention were accomplished, we suggested to him that rehabilitation was no longer necessary for him, but he requested to continue. He expected that rehabilitation would be a good tool to solve the problems he encountered in his daily life.

[Discussion]

A lack of awareness of the effect of full-length rehabilitation (rather than short-term intervention) can lead to lower motivation amongst patients for rehabilitation. Like other cases in Cambodia, this patient had low motivation for rehabilitation, although he had good potential for a remarkable recovery after the stroke. For that purpose, a restriction on activities should not have been placed on him as his office did. Close communication between rehabilitation personnel and patients is crucial to encourage patients to continue rehabilitation until it can have its full effect. If patients can understand the future goals and prognosis from the beginning of the intervention and can imagine life realistically after the expected improvement, they will be more encouraged to stay motivated, increase their sense of self-efficacy, and raise their level of social interaction.

Considering the huge impact of middle-aged stroke patients on families and communities economically and socially, it is urgently required to develop a framework to support the social involvement and social reintegration of such patients. The goals of rehabilitation are not only the improvement of physical function, but also the social reintegration of the patients. Mental and emotional support for patients should be also part of rehabilitation.

Case C5. A case of cerebral infarction with prolonged hospital stay because of family matters

[Present illness]

A female patient in her 70s. ADLs were independent before the onset. In January 2019, she felt weakness in her left leg and consulted Sunrise Japan Hospital. She was admitted and started treatment with a diagnosis of multiple cerebral infarctions involving the right frontal and parietal lobes and left corona radiata. The acute treatment was completed in about 2 weeks, but the family did not agree to let the patient leave for home. The patient was discharged home after approximately 6 months of hospitalisation.

[First examination at Sunrise Japan Hospital]

GCS: E4 V5 M6, MMT (Left side): Upper Limb 4 - Lower Limb 3, MMSE: 23/30 (mild dementia), mRS: 4, BI: 60/100.

She could feed herself independently. She needed a walking frame for walking. Other ADLs were partially dependent.

[Problems before the Kitahara-style intervention]

She lived at home with her son and his wife and two grandchildren, but during the daytime, family members other than the patient were away at work or school. As a result, a live-in domestic worker, who was not trained in professional long-term care skills, provided personal care, but the patient had taken falls many times at home.

Although the patient had the ability to live at home with minor assistance, the family members did not agree to have the patient at home. The hospital staff were concerned about a decline in cognitive function and mental activity caused by prolonged hospitalisation considering the patient's age and explained to the family members that her condition based on the professional assessment could allow the patient to leave the hospital and continue the rehabilitation as outpatient. The family members, however, still did not agree on the discharge from the hospital due to anxiety in caring for the patient at home, and she continued the unnecessary hospitalisation.

[Kitahara-style intervention of chronic-phase rehabilitation]

In this case, the most important goal was the alleviation of the family's anxiety. To achieve this goal, it was required to show the family that the patient was able to live safely at home without falling. The intervention in this case aimed at the improvement of the stability of the patient's gait and standing balance skills as well as the establishment of her own self-care movements, which could ensure safety at home. We introduced a walking frame to achieve walking stability. We also provided care guidance to the live-in domestic worker, focusing on care for walking, toileting, and bathing.

After about 2 weeks of rehabilitation, the MMT of the left leg increased from 3 to 4, but she still needed assistance to support herself whilst walking because she still felt unstable and fell easily when changing directions. The scores of mRS and BI did not change. We saw that the domestic worker provided excessive care for the patient, which could undermine the patient's own ability to live independently, so we instructed the domestic worker to reduce the care and assistance so that the patient could maximise her ability to perform her own activities. The patient also said that she could do more things on her own after the rehabilitation than before, though MMSE declined from 23 to 20.

In spite of our intensive training, we failed to persuade the family to agree to the discharge of the patient, and she finally left the hospital for economic reasons.

[Discussion]

Although the patient was ready to return home after the acute phase treatment and rehabilitation, the family did not accept the patient at home, and the period of hospitalisation was prolonged. One of the factors of the refusal of the patient's family was the lack of care skills of the domestic worker despite repeated instructions. The family could not be satisfied with the care provided by their domestic worker.

In the future, the older population is expected to increase, even in Cambodia. For older people to live safely at home, it is required to establish a system to provide training to families and community caregivers. Considering the demographic transition and social change resulting in a decrease in care-providing resources within families and communities, intermediary facilities between hospitals and homes will also be needed to avoid prolonged hospitalisation.

2.4.2. Cases in the Lao PDR

Case L1. A cerebral infarction case with continued rehabilitation using telecommunication

[Present illness]

A 58-year-old woman. The patient noticed paralysis of her upper left limb and speech impairment on 30 August 2018. She consulted a provincial hospital in northern Lao PDR and was diagnosed through a CT scan as cerebral infarction caused by the infarct of the right middle cerebral artery. She was referred to Mittaphab Hospital in Vientiane the next day. Rehabilitation by Kitahara staff started on 3 September. At the beginning of the intervention, the patient needed assistance even in standing up, but after 14 days of rehabilitation and staying at the hospital, the patient resumed the capability to get up independently. She could walk about 5 metres indoors with a cane but still needed moderate assistance. Toileting also required moderate assistance, but it was assessed that she could leave the hospital and continue rehabilitation at home.

[First examination by the Kitahara rehabilitation team]

GCS: E4 V5 M6, MMT (Left side): Upper Limb 2 - Lower Limb 2, mRS: 4, BI: 40/100.

Assistance required for walking and toileting but feeding possible independently.

Sensory disturbance at left-side upper and lower limb was observed.

[Challenges of this case]

The patient lived in a single dwelling unit with a roommate. The main living space was on the first floor, and the patient slept on the floor with a mattress so she did not have to climb up and down the stairs. She had many close neighbours, and her house always had visitors. She was self-employed, working from 9am to 4pm. She could drive a car by herself,

and she mainly used a car for transport.

Due to the risk of falling whilst walking, assistance was required for her ADLs, and the range of her activities was limited. She used diapers because she often could not get to a toilet on time.

[Kitahara-style intervention of chronic-phase rehabilitation]

During hospitalisation, rehabilitation was carried out for 1 hour every day for 14 days. After discharge, we had remote sessions using the Messenger app with the patient and the primary caregiver for 45 minutes each and discussed the suitable home-training practices in accordance with her actual life conditions and physical functions.

We set the goals in this case through the discussion with the patient and the primary caregiver:

- Within 2 months after discharge: walking indoors independently using a cane and toileting independently.
- Within 3 months after discharge: all ADLs indoors independent and walking outdoors independently.
- Within 1 year after discharge, return to work.

To achieve these goals, we created home rehabilitation programmes, including range of motion exercise, sit-to-stand and stand-to-sit movements, standing balance exercises, and walking practice. We also provided full instructions to the primary caregiver on the frequencies and critical points of the procedures.

MMT improved from 2 to 3 for the upper limbs and 2 to 3 for the lower limbs. Her walking ability improved, and she resumed a fully independent walking ability in 1 month after discharge both indoors and outdoors. Toileting had also become independent then. About a year after the onset, indoor walking was independent without a cane, and outdoor walking was independent using a cane. The patient could go out if accompanied with friends, however, she retired because of persistent upper limb paralysis and the necessity of a cane for walking outdoors. She lives using her savings supported by the primary caregiver and friends.

[Discussion]

In this case, intensive rehabilitation could be carried out during hospitalisation. After leaving hospital, remote communication was carried out once a week for 1 year between the rehabilitation professionals and the patient and the primary caregiver. As a result, the goal of outdoor independent walking was achieved earlier than expected.

Although she had severe paralysis as a sequela of stroke, the patient was motivated to receive rehabilitation. This may be partly because she had no cognitive impairment. In addition, the primary caregiver and neighbours were cooperative, and such support

enabled continued remote intervention. To achieve the full effect of rehabilitation, it is crucial to have opportunities for discussions on goal-setting based on the latest physical condition of the patient and mutual understanding about the procedures of home rehabilitation methods.

It was regrettable that she could not return to work. The severe paralysis of her upper limb was a challenging symptom in this case.

Case L2. A case of intracerebral haemorrhage with severe symptoms

[Present illness]

An 87-year-old male. On 2 January 2018, the patient had sudden consciousness disturbance. He was taken to Mittaphab Hospital by his family by car and diagnosed with a left intracerebral haemorrhage using a CT scan. He was subsequently admitted on the same day. The patient was treated in the intensive care unit (ICU) for 2 days and then transferred to the neurology ward on 4 January. The physician gave approval for starting rehabilitation from 5 January. The main symptoms were severe consciousness disturbance, right hemiplegia, and aphasia, and ADLs were totally dependent. For rehabilitation, the patient was transferred to a wheelchair with the full support of two assistants. After hospitalisation and treatment for 10 days, he was allowed to leave from hospital, but the ADLs were still fully dependent.

[First examination by the Kitahara rehabilitation team]

GCS: E1 V1 M1, MMT (Right side): Upper Limb 1 - Lower Limb 1, mRS: 5, BI 0/100.

Aphasia was observed.

[Challenges of this case]

The patient lived with five other family members. He had already retired and spent most of his time at home but could walk around the garden during the day before the onset.

In this case, the patient had severe consciousness disturbance and hemiplegia. Full assistance for his ADLs was still needed even after the discharge from hospital, so the possibility of secondary complications, such as bedsores and joint contracture, after discharge was high. The son was the primary caregiver but had no experience nor knowledge of caregiving.

[Kitahara-style intervention of chronic-phase rehabilitation]

During hospitalisation, rehabilitation was carried out 40 minutes every day for 5 days. After the discharge from hospital, we had regular video call sessions with the primary

caregivers and shared the living conditions and physical functions of the patient so that we could provide instructions on how to provide care and rehabilitation methods at home.

Through the discussions with the primary caregiver, we set the following goals which were to be achieved in 2 months after the hospital discharge: 1) improvement in consciousness disturbance, 2) prevention of secondary complications, 3) to be transferred to a wheelchair by the assistance of one person, 4) to keep sitting independently, and 5) to achieve oral feeding.

The rehabilitation programmes were created in accordance with the goals, which included range of motion exercise, practice of sit-to-stand and stand-to-sit, practice of standing, swallowing training, and seating on a wheelchair. We also provided the caregivers with instructions on how to implement the home care and home rehabilitation, including experts' know-how.

As a result of the 2-month intervention, GCS improved from E1V1M1 to E3V2M6, and MMT improved from 1 to 2 both for the upper and lower limbs, whereas full assistance was still required for his ADLs. He still spent most of time on the bed, but no secondary complications like bedsores or pneumonia occurred thanks to the appropriate care by the primary caregiver. The patient introduced a reclining wheelchair with a portable toilet function, which enabled toileting and bed bathing, so the burden of care on the primary caregiver had become lightened. The patient was becoming able to spend more time outdoors in the wheelchair.

In October 2019, his ADLs were still fully dependent, but he became able to understand what the caregiver said and reply by nodding. He could sit for one hour during the day and had been free from any secondary complications like bedsores or pneumonia.

[Discussion]

Tele-rehabilitation provides people in remote areas with opportunities for receiving quality rehabilitation services, but the effect has not been confirmed by systematic review (Laver et al., 2020). The progress of telecommunication tools like social media has brought the potential for patients to continue rehabilitation at home even after leaving hospital, and such technological advancement can reduce the length of stay of stroke patients at hospitals. In this case, the length of the hospital stay was only 10 days despite the severe symptoms of stroke, including consciousness disorder. Enough rehabilitation could not be provided whilst staying at the hospital, but after the discharge, regular intervention by Kitahara's chronic-phase rehabilitation team was continued. We had regular 40-minute remote sessions with the patient and the primary caregiver every 2 weeks, and the goals set at the beginning of our intervention had been achieved.

This is a typical example of effective tele-rehabilitation. Although the primary caregiver did not have knowledge or skills in caregiving, regular video call sessions enabled the primary caregiver to continue providing effective rehabilitation to the patient. We succeeded in achieving the pre-set goals, but the training of the swallowing function was

still challenging. He had not resumed his ability for oral intake even 1 year after the onset.

Case L3. A case of cerebral infarction where the resumption of independent life was successful

[Present illness]

A 62-year-old male. On 27 February 2018, the patient was struck with motor paralysis in the upper and lower right limbs and was admitted to a provincial hospital. On the following day, he was transferred to Mittaphab Hospital and diagnosed with left cerebral infarction from the result of a CT scan and clinical symptoms. He was admitted to the general ward of Mittaphab Hospital immediately. On 7 March, his doctor in charge gave approval for starting rehabilitation. When he started rehabilitation, his main symptom was right hemiparesis, and he could walk indoors 5 metres using cane, but he needed assistance for toileting. After 9 days of hospitalisation, when he left the hospital, his walking ability was improved to 30 metres walking using a quad cane, but assistance was still needed for toileting.

[First examination at the first rehabilitation by the Kitahara rehabilitation team]

GCS: E4 V5 M6, MMT (Right side): Upper Limb: 4 - Lower Limb: 3, mRS: 4, BI: 70/100, Berg Balance Scale: 49/56.

He could feed himself independently.

[Problems before the Kitahara-style intervention]

He lived with his wife who was the primary caregiver and nine children in a single dwelling. He had already retired and was no longer working. He could drive his own car.

At the time of hospital discharge, his BI was as high as 70/100, and he could walk using a quad cane, but assistance was required for walking and toileting due to his tremor and fear whilst walking. After the discharge, excessive caregiver assistance also hindered the recovery of his physical functions. He strongly desired to walk by himself and to be able to go out shopping by car, so intervention was continued as outpatient rehabilitation.

[Kitahara-style intervention of chronic-phase rehabilitation]

Outpatient rehabilitation was carried out 5 times a week for the first week after discharge, 3 times a week in the second week, and once a week in the fourth week. Self-exercise was carried out every day at home. We set the goals of intervention, which were supposed to be achieved in 1 month after the hospital discharge, based on the discussions with the patient and the primary caregiver: 1) independent walking indoors and outdoors without a cane, 2) toileting independence, and 3) ability to drive a car. We provided instructions

to the patient and the primary caregiver about the practical procedures of training, the number of reps, and frequency. We also called the attention of the caregivers to preventing the patient from falling down and managing his blood pressure. Too much caregiver assistance was strongly discouraged, and the caregiver was encouraged to let the patient carry out the ADLs as independently as possible.

Three weeks after discharge, MMT improved from 4 to 5 for the upper limb and 3 to 5 for the lower limb. The Berg Balance Scale improved to 56 points and fear whilst walking was eliminated. He resumed the ability of independent indoor/outdoor walking 1 month after discharge, and toileting also was independent then. Two months after discharge, he could confidently go outside within the town where he lives independently. As of October 2019, the patient could go shopping with his wife in a car driven by himself, and walking around the house was part of his daily routine.

[Discussion]

Caregivers' knowledge is crucial for unlocking the potential of people who need care. In this case, the primary caregiver did not have enough knowledge of care for older people and provided more assistance than was required. Excessive assistance limits the chances for people who receive care to practice ADLs independently, such as walking and toileting.

We showed both the patient and the primary caregiver the expected outcome of the rehabilitation. Letting the clients of rehabilitation understand the possible recovery level of their physical functions is crucially important to motivate them to practice their training. In this case, the patient resumed the ability to go out independently, even using a self-driving car. If rehabilitation succeeds in recovering the ADLs of clients, the caregiving burden on the family members and caregivers can be reduced, physically and economically. This case is one example of such a successful case.

Case L4. A putaminal haemorrhage case who could return to work

[Present illness]

A 42-year-old male. On 19 August 2018, the patient experienced motor paralysis in his lower left limb and was taken to a provincial hospital in Thailand by his family. He was diagnosed with a right putaminal haemorrhage according to a CT scan. After 3 weeks of hospitalisation there, he was transferred to and stayed at a rehabilitation centre in Vientiane for 4 weeks. He also received outpatient rehabilitation for 5 months after leaving the rehabilitation centre. He could walk independently without an assistance tool, but he was not satisfied that his condition did not allow him to work again. He consulted our facility and outpatient rehabilitation was started at Mittaphab Hospital in June 2019.

[First examination by the Kitahara chronic-phase rehabilitation team]

GCS: E4 V5 M6, MMT (Left side): Upper Limb 2 - Lower Limb: 4, ROM (Left side): shoulder flexion 100 degrees - elbow flexion 110 degrees - forearm supination 60 degrees - wrist flexion 70 degrees - wrist extension 40 degrees - 2nd to 5th distal and proximal interphalangeal extension 20 degrees, mRS: 3, BI: 95/100.

[Problems before the Kitahara-style intervention]

He lived with his wife and two children in a single dwelling. His profession was related to information technology, and he used a computer most of the time whilst working. He could drive his own car. He is a right-handed person.

At the first examination by us, most of his ADLs were independent, but the joint range of motion of the left fingers and forearm was restricted, leading to a restriction of voluntary movement. He had received rehabilitation training for several months, but it seemed that his training was not directly related to the skills that were required for his job. This was the reason why he could not return to work by then. He was the breadwinner of the family, so he had a strong desire to return to work.

[Kitahara-style intervention of chronic-phase rehabilitation]

Outpatient rehabilitation was performed for an hour, three times a week. This continued for 1 month. We sent the following goals which were supposed to be achieved 1 month after starting our rehabilitation services based on the discussions with the patient: 1) improvement in the voluntary movement of the upper left limb and 2) return to work. The rehabilitation programme included range of motion exercise, scapular mobilisation, muscle strengthening, and practice of in-hand manipulation. We shared the information on the procedures, number of reps, frequency, important points, etc. with the patient to let him practice the training at home. We also supported his return to work. We had regular meetings with his office and shared the information on the prognosis of his physical functions. We discussed the possible time of his return and the jobs he could be assigned whilst considering his status. We were also pleased to answer the concerns his office presented to us.

One month after starting intervention, MMT improved from 2 to 3 for the upper limb, and 4 to 5 for the lower limb. Range of motion (left side) also improved to 130 degrees for shoulder flexion, 130 degrees for elbow flexion, 80 degrees for forearm supination, 80 degrees for wrist flexion, 60 degrees for wrist extension, and -10 degrees for 2-5th distal and proximal interphalangeal extension. The patient had needed assistance for dressing before intervention but was completely independent after 1 month of intervention.

Two weeks after our series of intervention was completed, he returned to work but started with low labour intensity. His commuting was supported by his family. Two months later, although his operating speed was slower than before the onset, he could

work 5 days a week, from 9am to 4pm. In October 2019, 3 months after our intervention started, the patient could go to work using a self-driving car. Efficiency in his computer operation reached 80% of his previous skills before the onset. This case shows the importance of the assistance of co-workers for patients to return to the office.

[Discussion]

In this case, the Kitahara-style intervention began 10 months after the onset. The major problem of this patient was the decrease in flexibility of his fingers, not just paralysis. We administered the training focusing on the improvement in flexibility. More importantly, the main factors of the achievement of his goal, returning to work, were his motivation for self-exercise at home and the coordination with his office to realise his come-back.

Lao PDR has the facilities to provide functional training, ADL training, and vocational training for deafness, cerebral palsy, and spinal cord injury in Vientiane, but no agency provides support for stroke patients to return to work. The number of stroke patients is increasing in the Lao PDR, so such support services are urgently required.

Case L5. A case of old cerebral infarction who benefitted from effective community support

[Present illness]

A 70-year-old female. In 2011, the patient experienced paralysis in her upper and lower left limbs and was taken to Mittaphab Hospital by her family. She was diagnosed with cerebral infarction according to a CT scan and clinical findings. The main sequela of this case was mild left hemiparesis. Indoor walking was independent, but outdoor walking required support. She started Kitahara-style chronic-phase rehabilitation in June 2018.

[First examination by the Kitahara chronic-phase rehabilitation team]

GCS: E4 V5 M6, MMT (Left side): Upper Limb 4 - Lower Limb: 4, mRS: 3, BI: 85/100.

Outdoor walking for long distances was difficult due to low endurance.

[Problems before the Kitahara-style intervention]

She had four family members, including her, and lived in a single dwelling. Other family members had jobs out of the house, so the patient was alone at home during the daytime. She had few opportunities to go out and spent most of the time at home.

In this case, left hemiparesis and the resulting muscle weakness of her left side created an unbalance of her body whilst walking, and this was why mild support was required for walking outdoors. Other family members were too busy working to help her to go out. As a result, her social interaction was very limited, and her life heavily relied on her family, although her ADLs were independent.

[Kitahara-style intervention of chronic-phase rehabilitation]

She did not have any family members who could provide her with transport from her house to our rehabilitation office, but, luckily, another stroke patient who required rehabilitation lived in the same area. We suggested that both could receive rehabilitation services together and asked the local community members to provide transport to them.

Rehabilitation was carried out for 1 hour per visit, 2–4 days a week. We set the goals of this intervention together with the patient: 1) improvement in voluntary movement of the upper and lower left limbs and 2) independent outdoor walking. An intervention programme was created, and instructions to the patient were provided like in the other cases in the Lao PDR shown above. Self-exercise was encouraged to increase the patient's activities at home, and improvement of her walking balance which was impaired due to unbalanced muscle strength was sought.

Two months after the intervention was started, MMT improved from 4 to 5 for the upper limb, and 4 to 5 for the lower limb. Walking stability and improvement in standing position balance were achieved, and independent walking became possible. After outpatient rehabilitation was completed, interaction between the two patients who received rehabilitation services together increased, and they started to visit each other's houses.

As of October 2019, more than 1 year after intervention was completed, indoor and outdoor walking was independent, and the patient could live without falling.

[Discussion]

This case provides a good example in the following two points.

- Even for the case of old cerebral infarction, chronic-phase rehabilitation could bring an improvement in the quality of life of the client. In this case, the client started chronic-phase rehabilitation about 7 years after the onset.
- The support of the local community enabled the client to benefit from rehabilitation services. Without such support, she would not be able to come to our rehabilitation facility due to a lack of transport. Mutual support within local communities is a very important factor which can bring success in the intervention of chronic-phase rehabilitation.

2.4.3. Cases in Viet Nam

Case V1. A case of subarachnoid haemorrhage provided with home-visit rehabilitation

[Present illness]

A female patient in her 60s. The patient suffered a subarachnoid haemorrhage and cerebral haemorrhage. She was admitted to Bach Mai Hospital and coil embolisation was performed for the cerebral aneurysm. Hematoma was observed in the left frontal lobe, putamen, and thalamus. She was hospitalised for 2 months. When she left hospital, she

still had moderate quadriplegia, disorders of diminished motivation, and attention deficit. She also had tracheostomy made. Nutrition was provided through a nasogastric tube. Four months after the onset, she consulted Kitahara's rehabilitation team and home-visit rehabilitation began on 28 December 2018.

[First examination by Kitahara's chronic-phase rehabilitation team]

GCS: E4 V1 M5, MMT: right upper limb 1 – right lower limb 1 - left upper limb 2 - left lower limb 2, mRS: 5, BI: 0/100.

Disorders of diminished motivation and attention deficit were observed, possibly due to frontal lobe dysfunction.

She was bedridden, and her ADLs were fully dependent on caregivers. She had difficulty in speaking due to tracheostomy, but she could understand simple instructions.

[Problems before the Kitahara-style intervention]

The patient spent most of her time in bed. The primary caregiver was a domestic worker and she took care of the patient 24 hours a day. Before the onset, the patient lived with her husband, whilst her son's family lived nearby. When she left hospital, she moved to her son's house rather than her house. Required care was mostly provided by the domestic worker not by the family members. They had a suction machine and nursing bed at home. The patient was dependent on nasogastric feeding.

Consciousness disturbance gradually improved for months after the onset. She continued rehabilitation at home instructed by a local hospital for 2 months after the hospital discharge. Due to the consciousness disturbance, disorders of diminished motivation, and attention deficit, she had very little voluntarily exercise. The caregiver provided any care required for her daily living without considering her residual functions even after the stroke, and the patient had few opportunities to regain her potential physical and mental functions. She did not have a wheelchair, so she could not move out of bed.

[Kitahara-style intervention of chronic-phase rehabilitation]

Rehabilitation was provided twice a week at home, and the duration of one session was 45 minutes from 28 December 2018 to 25 June 2019. We encouraged the caregiver as well as the family members to let the patient do whatever she could and to avoid over-assistance. We instructed them how to help the patient sit up, move from the bed to the wheelchair, and get in and out of a car to facilitate the movement of the patient. We showed them the practical training for feeding and dressing so that they could also practice at home. We also assessed the patient's swallowing function and the function of her respiratory system. As the consciousness disturbance was getting better day by day, the swallowing function and respiratory function were also improved. We consulted a

doctor from Viet Duc University Hospital asking if the tracheostomy tube could be removed and the tracheostoma could be closed to improve the swallowing function. The tracheostomy tube was removed on 16 January 2019. We continued to provide swallowing exercises even after the tracheostomy tube de-cannulation, and the patient was able to feed by mouth at the beginning of February 2019. We recommended them to purchase an easy-to-use wheelchair which had swing-away leg-rests because it could let her have a good posture on the seat and could be seated comfortably. To improve home accessibility using the wheelchair, a ramp was installed in front of the house.

As a result of our intervention, her tracheostomy was no longer needed and she could resume oral feeding. She became able to sit up and transfer to a wheelchair if assistance was provided. Opportunities to go out with the family or the caregiver by wheelchair increased.

[Discussion]

Kitahara's chronic-phase rehabilitation team started home-visit sessions 4 months after the onset of subarachnoid haemorrhage. Instructions to the caregiver and family members and the adjustment of the living environment could increase the opportunities for the patient to move around within and outside of the house. As of July 2019, almost 1 year after the onset, the physical function and communication ability of the patient were still improving.

In Viet Nam, some families employ domestic workers as caregivers, in case their family members' physical and mental functions deteriorate and they need care to maintain their daily lives. Most of these domestic workers do not have the necessary knowledge or skills required for caregiving, so it is not possible for them to provide suitable care in accordance with the functional status of the clients. The key to the success in this case was the education to the caregiver and family members through home-visit sessions so that they could understand the importance of letting the patient try to do as much as possible to maximise her residual functions.

Case V2. A case of old cerebral infarction whose main symptom was ataxia

[Present illness]

A male patient in his 60s. On 1 April 2018, the patient experienced a cerebral infarction during a trip to the United States and was admitted to a hospital there for 5 days. He was then discharged from the hospital and returned to his family's house in the United States. He returned to Viet Nam in August 2018. ADL was independent, however, mild right hemiparesis and ataxia were observed. He desired to walk faster and visited the outpatient department of Viet Duc University Hospital on 13 February 2019. He was referred to Kitahara's rehabilitation team on the same day.

[First examination by Kitahara's rehabilitation team]

GCS: E4 V5 M6, MMT (Right side): Upper limb 4 - Lower limb 4, mRS: 2, BI: 100/100.

Finger-to-nose test and heel-to-shin test showed he had dysdiadochokinesia.

Single-leg stance test: Right 3 seconds - Left 10 seconds.

10-metre walking test: 16 seconds (24 steps).

[Problems before the Kitahara-style intervention]

The patient lived with his son, his son's wife, and a grandchild. He had already retired and did not have a job. His daily routine was early-morning exercise outdoors. His ADLs were independent and could go up and down the stairs independently, but long-distance walks made him easily tired. The range of his outdoor activities was restricted due to his slower walking speed and impaired endurance whilst walking.

[Kitahara-style intervention]

Outpatient rehabilitation was carried out every day for 45 minutes per session for 10 days. We identified that his main problem was ataxic movement and hyperactivity of his left hip flexor muscles and trunk extensor muscles as compensation for ataxia, so we focused on the improvement of his body stability and posture support in our intervention. Specifically, our intervention aimed at the improvement of the flexibility of his body trunk and left hip joint so that his right hip muscles would be balanced with the other side. We also provided him with instructions on self-training at home. The contents of the self-training were created in accordance with the results of his posture and movement analysis.

On the last day of outpatient rehabilitation, the result of the single-leg stance test of his right leg was improved to 10 seconds, which was same as the unaffected left side. The 10-metre walking test was improved to 12 seconds (20 steps). The patient had understood the method of self-training and practiced it at home.

[Discussion]

In this case, the Kitahara intervention started 10 months after the onset, but improvement in body balance and gait speed was achieved through the implementation of the appropriate training, including self-training. We have found that some patients with mild symptoms do not like listening to the recommendations of rehabilitation professionals and perform training in their own ways. Such patients, in many cases, fail to improve their physical functions to their maximum potential, resulting in an increase in the burden on themselves. We administered to this patient a concentrated intervention of rehabilitation in a short period, and this case shows that such a short intervention could achieve a desirable outcome, even for the patients with mild symptoms and chronic cases.

Case V3. A case of recurrent cerebral infarction with hemiplegia and severely impaired ADLs

[Present illness]

A male patient in his 60s. The patient suffered cerebral infarction, resulting in right hemiplegia. Rehabilitation began on the 12th day from the onset. The patient was discharged after 64 days of hospitalisation at an acute care hospital and then returned home. After discharge, outpatient rehabilitation was carried out three times a week. He had been undergoing haemodialysis three times a week since before the onset of the cerebral infarction at the time. He had suffered another cerebral infarction 3 years before this attack, but no obvious physical functional disability had been observed after the previous attack.

[First examination by Kitahara's chronic-phase rehabilitation team]

GCS: E4 V2 M6, MMT (Right side): Upper limb 1 - Lower limb: 2, mRS 5, BI: 10/100.

Patient had slurred speech and aphasia.

His ADLs were almost fully dependent, and he was fed through a nasogastric tube.

[Problems before the Kitahara-style intervention]

The patient lived with his son and his son's wife. He had already retired. The house was a single dwelling with three stories. The patient's bedroom was on the middle floor, whilst the eating space of the family was on the ground floor. He did not go down to the ground floor for feeding because of difficulty in using the stairs as well as the incapability of oral feeding, which hindered him from enjoying mealtimes with the family. When he left hospital, he purchased a reclining wheelchair. Handrails were also installed along the stairs in the house.

From the onset, the patient was bedridden for 2 weeks. When he left hospital, he was using a wheelchair, but he could not walk on his feet even for a short distance. He needed to improve his endurance for physical activities, but it was not easy to increase the level of activities. His family members were more than willing to provide care for the patient, but their excessive assistance could have hindered his functional recovery after stroke.

[Kitahara-style intervention]

Outpatient rehabilitation was carried out 60 minutes per session, three times a week for a total of 28 sessions. Home-visit sessions were also implemented once a week. At outpatient rehabilitation, the training focused on improving the body balance function and gait stability. We encouraged the family members to continue the training as home care and increase the physical activities of the patient. During the home visit, we checked his living arrangements at home and advised them to install a handrail along the stairs

and renovate the bathroom to make his toileting and bathing easier. A special chair for the shower room was also installed. We also demonstrated actual training that could be done within the house for the improvement of his gait and ADLs, such as getting up from bed, walking through the narrow hallway, and going up and down the stairs.

We started to provide swallowing exercises on the 23rd day from the onset day. The patient resumed his oral feeding function on the 28th day from the onset day.

As a result of our intervention, mRS was improved to 4, and BI also increased to 60. He became able to walk within the house if assisted, and other ADLs were also improved, although he still needed some assistance. He stayed only on the middle floor of the house without coming downstairs when he returned home from hospital, but after our intervention, he more often comes downstairs to have meals with his family and his oral intake was resumed instead of using a tube feeding.

[Discussion]

Because of the long bed-ridden period, the patient lost his tolerance for physical activities. We tried to increase his capacity for physical activities through the training and the adjustment of his living environment, such as the instalment of handrails and the renovation of the bathroom. We also encouraged him and the family members to have meals together downstairs so that he could be motivated to go down the stairs from upstairs where he usually stayed. Before our intervention, his family had believed that the patient was not able to come downstairs, so he fed himself alone upstairs. He also became able to bathe using the shower chair with assistance from his family members thanks to the renovation of the bathroom.

During the home-visit rehabilitation, we always assessed his functions and his living arrangement and advised him and the family members on the renovation of his living environment based on our assessment. We believe the home-visit session was quite effective for the improvement of the ADLs of the patient because we could find solutions for the specific problems faced by the patient and his family. They could also understand how to practically carry out the training at home. This case shows the potential of rehabilitation services for patients who are severely disabled.

2.5. Suggestions for the improvement of QOL of the brain injury patients and families

We reported the results of the questionnaire survey targeting the family members of brain injury patients, field surveys of selected hospitals, and case studies that were conducted in Cambodia, the Lao PDR, and Viet Nam. The strength of our studies is the data collected from the practical sites of chronic-phase rehabilitation. In this section, we would like to make several suggestions to improve the lives of brain injury patients and their caregivers, most of whom are family caregivers, which are derived from our experiences of the practical sites of rehabilitation.

1) Multi-stakeholder collaboration, telecommunication tools, and increase of awareness

The healthcare systems in Cambodia, Lao PDR, and Viet Nam do not necessarily have enough capacity to provide satisfactory chronic-phase rehabilitation services, especially in rural areas. Coupled with the ignorance of the effect of chronic-phase rehabilitation amongst the people there, it is expected that insufficient healthcare systems fail to recover and optimise the residual functions of stroke patients whose ADLs are so impaired that care provision is required. In these countries, long-term care is mainly provided by family caregivers. As a result, quite a few families who have stroke patients with severe disabilities face an economic and social burden to take care of patients who have failed to improve their functions because of the lack of chances to undergo appropriate rehabilitation services.

Considering the sequelae of stroke which greatly restricts the ADLs of patients, stroke cases have a considerable impact on the families and even the communities, economically and socially. Particularly in such areas, as stated in the previous paragraph, where healthcare systems cannot necessarily provide enough services, collaboration amongst basic healthcare service providers is crucial, from the bodies involved with disease prevention, to acute care, rehabilitation, and long-term care. Not only the public sector but also private businesses have the potential to contribute to the improvement of services, for example long-term care services. Providing such basic services universally is more important than expanding specialised services.

Medical institutions and staff are often concentrated in urban areas, so the use of telecommunication tools has the potential to make it possible to deliver the services of urban areas to rural areas. For example, we succeeded in showing through the examples in this chapter that the instructions for continuous rehabilitation for stroke patients after hospital discharge could be provided even to patients in rural areas through online sessions. The education of medical staff personnel engaged in rehabilitation and long-term care could also be provided using telecommunication tools.

Improvement of the awareness of diseases and their prevention methods, as well as the skills and knowledge of long-term care, is also needed not only for healthcare personnel but also for the families of patients. Such educational activities will strengthen the capacity of societies and communities to mitigate the impacts of the increasing number of stroke patients that will take place as populations age.

2) Reintegration of patients with brain damage and social security

Most patients with brain damage have disabilities, and the extent of their disabilities varies considerably. In Cambodia, the Lao PDR, and Viet Nam, such patients can somehow receive medical rehabilitation services at acute care hospitals, but most of them face difficulties in adjusting their daily lives to the impaired physical and mental functions after they leave hospital for home. Particularly in the case of the patients who are in the

productive-age population and who are breadwinners for their families, it can be a really critical issue whether they can resume working as before the attack or not. In these three countries, where social security systems are developing, it would be difficult for them to expect enough specific support that facilitates the social reintegration of the patients with brain damage, such as employment support, vocational rehabilitation, or other programmes aiming for promoting the independent lives of brain damage patients.

We believe proper assessment of the residual functions of the patients and the understanding of the needs of employers are the most important factors to encourage the employment of people with disabilities. Rehabilitation professionals are in the best position to mediate between them. Both patients and employers have concerns and anxieties regarding being employed and employing. Rehabilitation professionals can understand both concerns and bridge the gap between the two parties as stated in this chapter. All three countries have limited human resources for the promotion of the re-employment of stroke and brain trauma patients. We consider that rehabilitation professionals are required to be involved with not only medical rehabilitation but also social and vocational rehabilitation in societies with scarce human resources.

In Southeast Asia, which has one of the fastest growing aged population in the world, we can find some remarkable activities that promote the social inclusion of older people living with disabilities. For example, at the Cho Ray Hospital in Ho Chi Minh City, leisure activities such as group exercises and group singing are provided targeting patients who have received treatment for stroke or traumatic brain injury and left for home. The participants of these activities have improved self-efficacy and mobility. As another example, a NPO called Rehab-Care for ASIA has established a daycare centre in the Photharam District, Ratchaburi Province, Thailand, with the cooperation of the Ministry of Health, local governments, hospitals, and volunteer organisations to contribute to the promotion of the social participation of the community's frail and bedridden older people, and they are succeeding in reducing the number of bedridden people in the region. The key to the success of these cases is the collaborative approach, which integrates the activities of communities, local authorities, NGOs, hospitals, schools, and even the national government. Such an approach can strengthen the mutual support of communities and promote the social inclusion of people with disabilities.

Social security systems like disability pensions do exist in these three countries, but it cannot be said that the systems are fully utilised, probably because the expected beneficiaries do not know about the systems well. Many brain damage patients have difficulty in working due to the aftereffects, as well as the expenses, of treatment. It is encouraged to raise the awareness of social security programmes and services available amongst not only patients and their families but also healthcare providers so that the benefit of social security systems can reach the people who really need it.

3) Support for family caregivers

In many countries and societies, the main caregivers for older people used to be or still are family members and community members. In the contemporary world where demographic transition and urbanisation are taking place, more people go to work outside of the house, including women who mainly take the role of caregiving in many cultures, and family size is shrinking as a result of demographic change. Such change in social structure undermines the capacity of caregiving of families and communities. The three study countries are not an exception.

Patients with severe brain injury often require considerable assistance in ADLs. Acute phase rehabilitation provided by acute care hospitals can improve the physical and mental functions of the patients to some extent, but in most cases, long-term care, which can be extensive care from toileting to bathing, etc. is still required even after they come back home, and such care work can impose a physical and mental burden on family caregivers. Family caregivers need the chance to take respite.

In countries that have developed welfare systems for older people, facilities that provide respite to family caregivers have been established, such as nursing homes, daycare centres, and short stay units, etc.

In Cambodia, the Lao PDR, and Viet Nam, only few such facilities can be found, but Sunrise Japan Hospital Phnom Penh in Cambodia offers a short-stay package for the respite of family caregivers. The hospital provides beds in a ward and rehabilitation services, but it charges lower prices than for regular hospitalisation.

Also, in Sunrise Japan Hospital Phnom Penh, individualised sessions to instruct how to provide care are provided to the patients and family members, such as care for bed-ridden people and those who need wheelchairs. For the severest cases, instructions are provided almost every day from admission to discharge. Even after leaving the hospital, family members are encouraged to participate in outpatient rehabilitation sessions so that they can learn how to let the patients exercise at home and how to interact with the patients.

The business of institutionalised care, like nursing homes, is still not easy to develop in these three countries because the number of people who can afford the high cost of private nursing homes is still very limited. Caregivers who have professional skills and knowledge are also scarce. Strong filial piety can also be considered to be a major reason for families' aversion to institutionalised care facilities.

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Chapter 3

Nutrition Management and the Promotion of Healthy Food

According to *The State of Food Security and Nutrition in the World* report in 2020, 690 million people worldwide, about 8.9% of the world's population, is hungry currently (FAO et al., 2020). In 2019, Africa represented 40% of all stunted children in the world, whilst Asia comprised 54%. Most regions have made some progress in reducing stunting between 2012 and 2019 (FAO et al., 2020). On the other hand, the issue of obesity in adults is becoming more serious, with 1 in 3 adults said to be either obese or overweight around the world. This trend was previously more apparent in advanced countries, such as North America, but obesity or overweight is becoming more common even in developing countries. The numbers of adults classified as obese or overweight in developing nations increased from 250 million in 1980 to 904 million in 2008 (Wiggins and Keats, 2014). The rise in obesity and overweight amongst developing countries has been attributed to dietary changes with the increase in income. It is also attributed to a decrease in hours of physical labour in daily life, in addition to an increase in the amount of time sitting.

Malnutrition and obesity coexist in many countries, even in the same areas and family. Difficulty in obtaining nutritious food due to increases in costs, stress regarding food insecurity, and physiological adaptation from insufficient food intake have been suggested to result in higher risks of obesity or overweight in families with food insecurity. There has been limited improvement in treating malnutrition, which takes various forms, from growth inhibition in children to obesity in adults, and this has resulted in exposing many people to health risks (Wiggins and Keats, 2014).

Efforts regarding issues of nutrition around the world were initiated by the foundation of Scaling Up Nutrition (SUN) in 2010, which led to international projects on the improvement of nutrition. Following this, the 65th World Health Assembly was held in May 2012, which focused on mothers and children and the improvement of all forms of malnutrition issues, leading to the establishment of the Global Nutrition Target 2025. In the World Summit on Sustainable Development in 2015, the member states of the United Nations adopted the 2030 Agenda for Sustainable Development, including the Sustainable Development Goals (SDGs), which address not only hunger but the extermination of all forms of malnutrition, including obesity and excess or insufficient nutrients. Also, in response to this, the G20 Summit held in the same year emphasised the need for stronger cooperation between the public and private sectors for sustainable development.

For Japan, there have been a number of nutrition-improvement programmes recently in developing countries, involving food-related businesses with the support of JICA and JETRO, etc. The healthcare policy launched by the Government of Japan in 2014 includes the importance of the improvement of nutrition as an example of support via public-

private partnerships.

In light of the fact that Japan and the UK affirmed in a joint statement their intention to strengthen worldwide initiatives to improve nutrition in the lead-up to the 2020 Tokyo Olympics and Paralympics, the government will make use of Japan's outstanding R&D capabilities in the field of fortified foods and promote the overseas expansion of inclusive business via public-private partnerships focused on improving nutrition across the globe, including in emerging and developing countries. (Government of Japan, 2014) .

As a response to this initiative, the Nutrition Japan Public-Private Platform was established in 2016, which explores the means of promoting investment from private companies globally in the field of nutrition.

Despite the initiation of many projects worldwide and in Japan since 2010, these have been limited in impact, and there are many challenges yet to be resolved.

This chapter discusses the current circumstances and awareness of dietary habits at research counterpart hospitals in three target countries. The subjects of the study are inpatients whose disorders were caused by lifestyle diseases that are closely associated with dietary habits. In addition, patients' trends in psychological behaviour and backgrounds that attributed to the dietary habits will be analysed to observe the trends. Following this, investigation will be conducted on how the diet-focused health guidance can be applied for similar patients in these countries and the possibility to propose projects for the promotion of healthy diets.

3.1. Awareness survey on the actual conditions of dietary habits and nutrition management

(1) Introduction

Dietary habits are affected not only by the available food and drink but also by the situations in a person's life, as well as personal values and customs. By understanding the dietary habits from various viewpoints, guidance for patients and individuals with a history of poor dietary habits can be properly provided. In this study, tendencies in personal thinking, values, and customs were considered, and the trends and actual conditions in the dietary habits in each country were surveyed.

(2) Subjects

Thirty cases of patients diagnosed with stroke or head injury from amongst outpatients and inpatients in Cambodia (Sunrise Japan Hospital Phnom Penh), Lao PDR (Mittaphab Hospital), and Viet Nam (Viet Duc University Hospital) between August 2018 and December 2019 were targeted. Outpatients were interviewed on their current life conditions, and inpatients were interviewed regarding their life conditions before hospitalisation. Cases where oral intake was difficult at the time of the survey were excluded (Table 3.1).

(3) Survey/Measurement items

A structured questionnaire survey was conducted to collect basic information (gender, name of disease, mRS) and information related to the dietary habits and nutritional management of the participants. The main questions are classified into five categories: (1) daily routines and times, (2) addictive habits, (3) objective measures and health literacy, (4) awareness of a healthy diet, and (5) interest in dietary services. Photos of the meals were taken, and the dishes which appeared in the photos were classified into staple foods, main dishes, and side dishes, in accordance with the Japanese dietary balance guide (Ministry of Agriculture, Forestry and Fisheries of Japan, 2015a; 2015b).

(4) Procedures

Interviews were carried out in line with the interview guide. Informed consent was obtained from the participants or their family members in advance. The necessity of the dietary consultation services for each participant was assessed, taking the results of this study into consideration.

(5) Results

Basic information

Table 3.1. Basic information
(awareness survey on the actual conditions of dietary habits and nutrition management)

	Cambodia	Lao PDR	Viet Nam
Number of participants	15 males 15 females	16 males 14 females	25 males 5 females
Diagnosis	Stroke: 30	Stroke: 30	Stroke: 3 Head injury: 26 Brain tumour: 1 person
Severity (mRS)	mRS2: 3 mRS3: 5 mRS4: 15 mRS5: 6 Unknown: 2	mRS 1: 2 mRS 2: 5 mRS 3: 4 mRS 4: 11 mRS5:8	mRS1:3 mRS2:9 mRS3:6 mRS4:11 mRS5:1

Source: Authors.

Cambodia

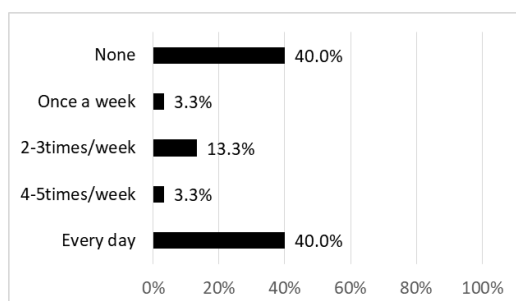
1) Daily routines and times

Most commonly, the study participants got up at 5am (40%) and went to sleep at 9pm (43%). The average sleeping time was 8.35 hours.

The most common times for meals were 7am (70%) for breakfast, 11am (43%) for lunch, and 6pm (47%) for dinner. Many participants went to sleep approximately 3 hours after dinner.

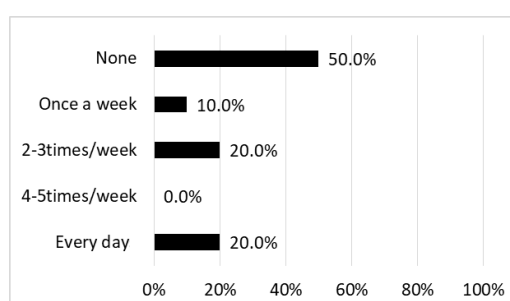
Of the respondents, 60% had a regular exercise routine, of which 40% exercised every day (Figure 3.1). Meanwhile, 50% of the participants had a snacking habit, and 20.0% of them had snacks every day, whilst 20.0% had them 2–3 times a week 20.0% (Figure 3.2).

Figure 3.1. Exercise habits [N=30]



Source: Authors.

Figure 3.2. Snacking habits [N=30]



Source: Authors.

In the photo study, we collected 14 breakfast photos, 20 lunch photos, and 18 dinner photos from seven respondents. For breakfast, 64% were meals with a staple food and main dish only, and 36% were meals with only a staple food. The number of main dishes was usually one, consisting of grilled meat or fish and put over rice (porridge). No respondents had a side dish at breakfast, so this means no vegetables were eaten at breakfast. For lunch, 60% consisted of a staple food, main dish, and side dish, and 30% had a staple food and main dish only. Compared to breakfast, more respondents had side dishes, however, for the number of side dishes, having one dish was the most common. For dinner as well, 60% of the photos showed a combination of a staple food, main dish, and side dish. Most had two or more side dishes. On the other hand, 37% had a staple food and main dish only. At dinner, however, most had a meal that mainly consisted of a combination of rice with stir fried vegetables and meat or fish and soup, so vegetables were included even in the main dishes.

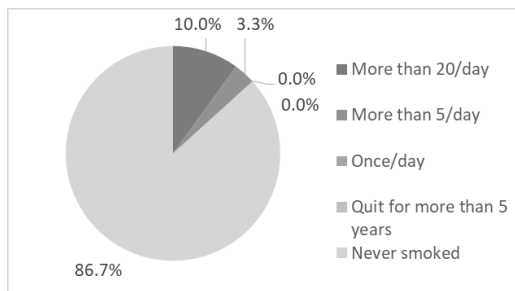
As the main dish, meat was eaten more at breakfast and dinner, whilst fish was eaten more for lunch. Eggs and shrimp were also used. The meal ingredients varied. Most vegetables were eaten in a stir fry or soup. Protein sources in meals in Cambodia were found not only in the main dish but also in soups and stir fries, so there were two types of servings of main dishes: 1) staple food and grilled meat or fish only, or 2) set of staple food and soup with vegetables and meat or fish.

2) Other habits

With regard to smoking, 86.7% of the study participants reported 'never smoke' (Figure 3.3). For alcohol, 80% reported 'do not drink' (Figure 3.4). Therefore, it can be interpreted that smoking and drinking alcohol were not common.

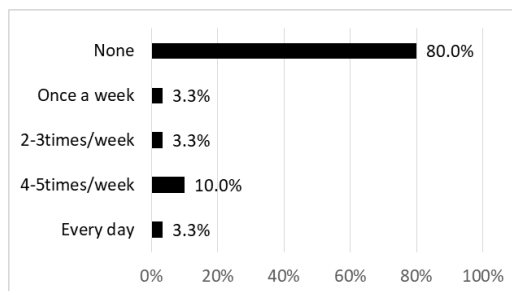
Half of the study participants had the habit of eating snacks. In terms of the frequencies of eating snacks, 20% of the participants who had such a habit ate snacks 2–3 times a week, followed by every day (16.7%) and once a week (13.3%) (Figure 3.5).

Figure 3.3. Smoking habits [N=30]



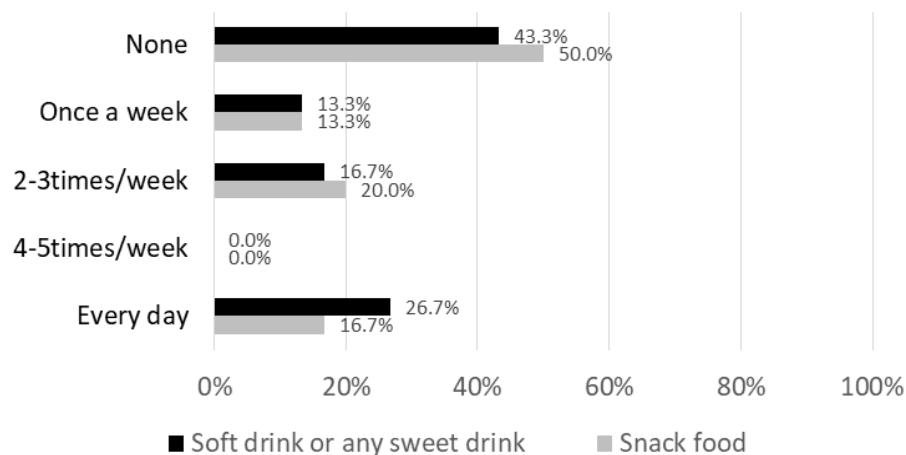
Source: Authors.

Figure 3.4. Drinking habits [N=30]



Source: Authors.

Figure 3.5. Frequency of snacks and sweetened drinks [N=30]



Source: Authors.

3) Objective measures and health literacy

We measured the height and weight of the study participants and computed the body mass index (BMI). The World Health Organization defines 'underweight' and 'overweight' in several ways, but we used the definition based on the crude values of BMI: underweight – BMI is less than 18.5, whilst overweight – BMI is 25 or more (World

Health Organization, 2021). We also asked the participants about their self-assessment of their own body shapes: thin, normal, or fat. Table 3.2 shows the cross-tabulation of the actual BMIs and the self-assessment results. Amongst the 30 participants, the self-assessment results of 21 participants were concordant with the categories of their actual BMIs. The statistical test also shows their self-assessment results are not significantly different from the BMI results ($p < 0.01$, Fisher's exact test).

Table 3.2. Body mass index and self-assessment of body shape (Cambodia) [N=30]

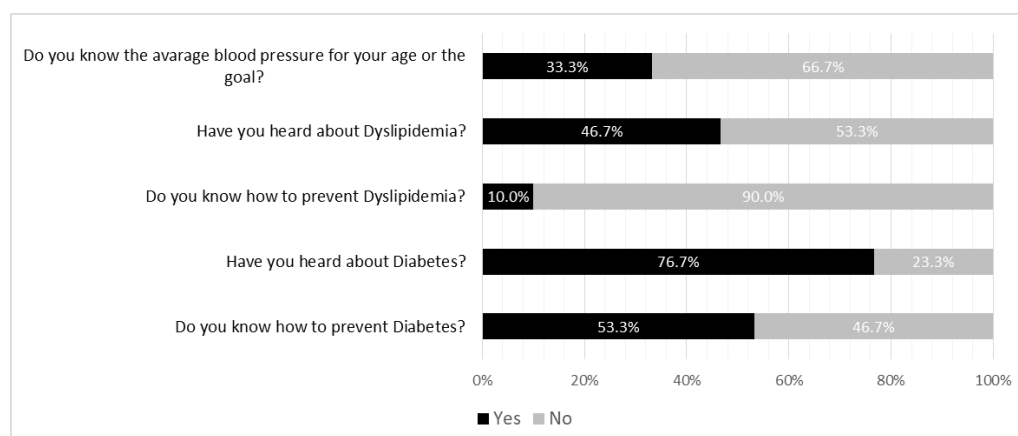
		Self-assessment		
		Thin	Normal	Fat
BMI (kg/m ²)	<18.5	1	0	0
	18.5–25	2	8	4
	25≤	0	3	12

Source: Authors.

Figure 3.6 shows the awareness of some key lifestyle diseases: hypertension, hyperlipidaemia, and diabetes. Only 33.3% of the study participants knew the average or ideal blood pressure for their age. About half of them were aware of hyperlipidaemia, whilst 10% knew preventive measures against hyperlipidaemia. Awareness of diabetes was as high as 90%. However, only a half of the study participants were familiar with prevention methods. Some participants reported that the sources of information on diabetes were their family members who had diabetes.

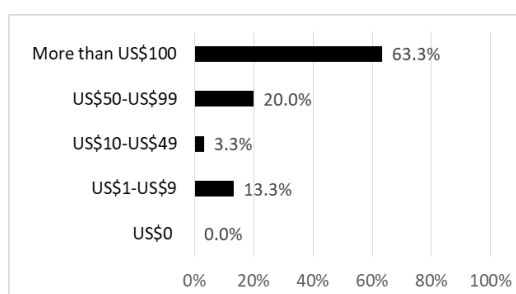
Regarding the payable amount for health, 19 study participants answered that they could spend more than US\$100, followed by US\$50–US\$99 (20%), US\$1–US\$9 (13.3%), and US\$1–US\$49 (3.3%) (Figure 3.7).

Figure 3.6. Awareness of lifestyle diseases and prevention measures (Cambodia) [N=30]



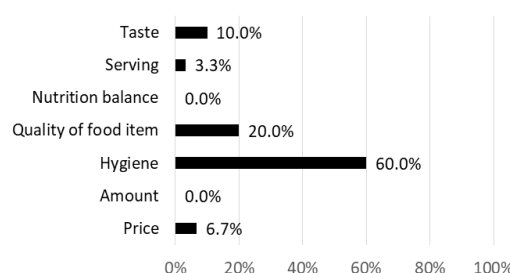
Source: Authors.

Figure 3.7. Income available for use on healthcare (Cambodia, per month) [N=30]



Source: Authors.

Figure 3.8. Most important point when selecting food (Cambodia) [N=30]



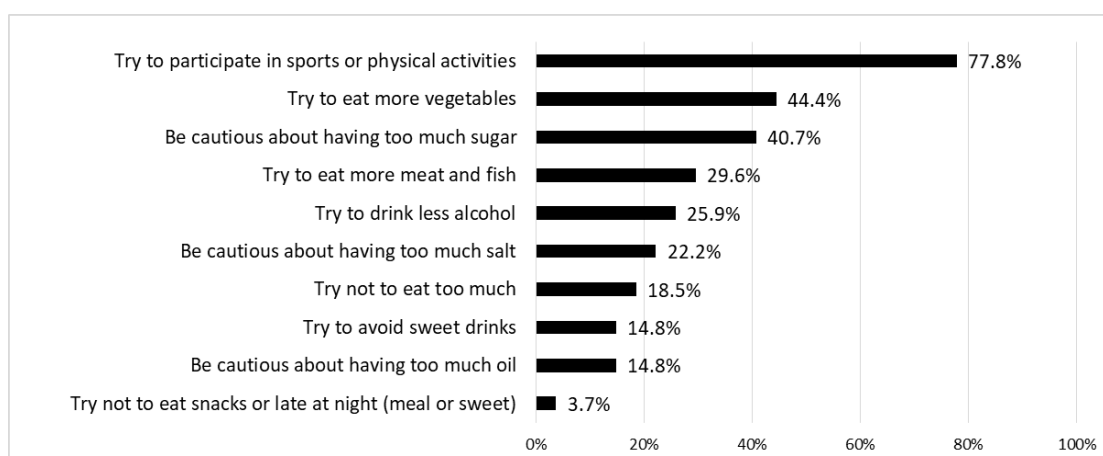
Source: Authors.

4) Awareness of healthy diet

To the question ‘what is the most important for your meal’, 18 in 30 study participants (60%) answered ‘hygiene’, followed by quality (20%) and taste (10%). No participants answered ‘amount’ or ‘nutrition balance’ (Figure 3.8). As for the reasons why ‘hygiene’ was chosen, they said that diarrhoea and vomiting could be prevented by eating hygienic food and it was good for health.

Of the 30 respondents, 27 reported that they had concerns regarding health. As shown in Figure 3.9, in detail, the most common practice carried out by the study participants to promote health was ‘try to participate in sports or physical activities’ (77.8 %), followed by ‘try to eat more vegetables’ (44.4 %) and ‘be cautious about having too much sugar’ (40.7%). We also asked them about their supplement intake, and one in three study participants reported that they took supplements either ‘always’ or ‘sometimes’.

Figure 3.9. Practices for health promotion (Cambodia) [N=27, Multiple answers with a maximum selection of three items allowed]

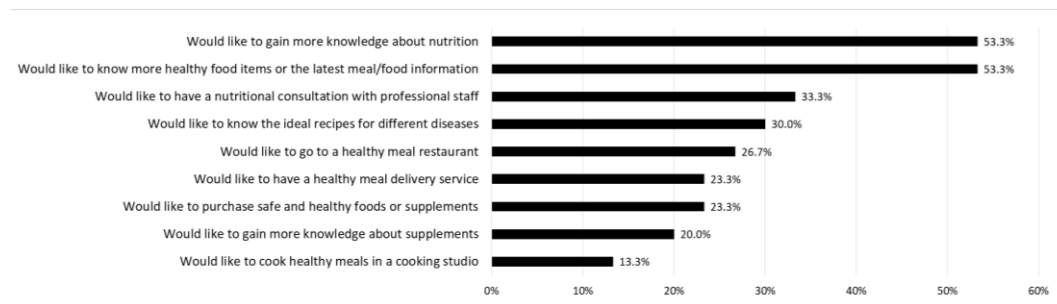


Source: Authors.

5) Interest in dietary services

We asked them about the dietary services they hoped to use. As shown in Figure 3.10, the most common items selected were related to obtaining knowledge about nutrition and the latest information of healthy food items (53.3%), followed by a nutritional consultation with professional staff (33.3%).

Figure 3.10. Interest in dietary services (Cambodia)
[N=30, Multiple answers with a maximum selection of three items allowed]



Source: Authors.

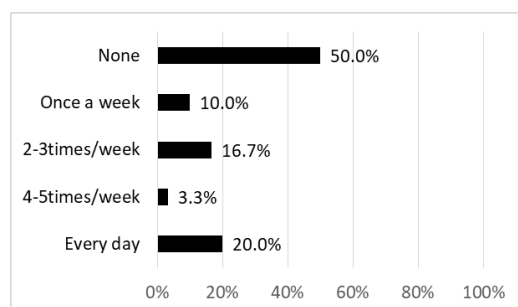
Lao PDR

1) Daily routines and times

The most common wake-up time was 6 a.m. (14 amongst 30 study participants, or 47%) and the most common bedtime was 9 p.m. (13 participants or 43%). The average sleeping time was 8.2 hours. The most common mealtime was 7 a.m. (47%) for breakfast, 11 a.m. (47%) for lunch, and 6 p.m. or 7 p.m. (both were 40%) for dinner.

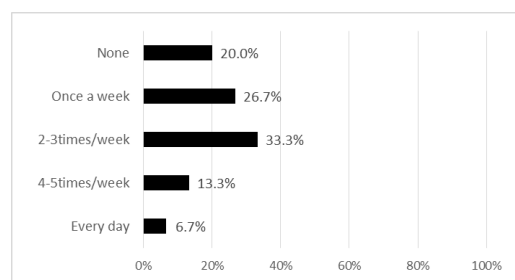
Half of all respondents reported they exercised routinely. Amongst those who practiced routine exercise, 20% exercised every day (Figure 3.11). Twenty-six study participants had snacking habits, and in terms of the frequency of snacking, 2–3 times a week was the most common (10 participants or 33%) (Figure 3.12).

Figure 3.11. Exercise habits [N=30]



Source: Authors.

Figure 3.12. Snacking habits [N=30]



Source: Authors.

From the photo survey, we collected 45 photos each of breakfast, lunch, and dinner from 15 respondents. Rice was the overwhelmingly dominant staple food and eaten at every mealtime by most of the study participants.

The meal content was almost the same for breakfast, lunch, and dinner. Regardless of which main or side dishes, every meal had vegetables. The number of dishes was not much. The ratio of rice and other food was about half and half, or more rice than other food.

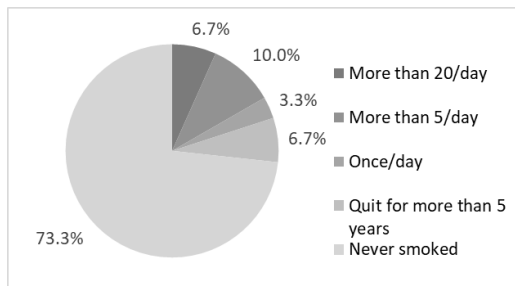
For the main dishes, fish was more served than meat for any meal. Fish was grilled and added to soup with vegetables.

2) Other habits

Most study participants reported that they never smoked (73.3%) (Figure 3.13), whilst about half of them answered that their family members had smoking habits (Figure 3.14). Also, most study participants did not have drinking habits (76.7%) (Figure 3.15).

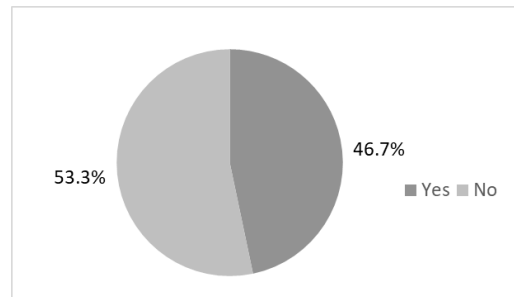
Regarding the frequency of snacking habits, one third of the study participants answered that they had snacks 2–3 times a week, followed by once a week (26.7%), and none (20.0%) (Figure 3.16). Regarding the frequency of having sweetened drinks, 11 study participants (36.7%) reported that they had them 2–3 times a week (Figure 3.16).

Figure 3.13. Smoking habits
[N=30]



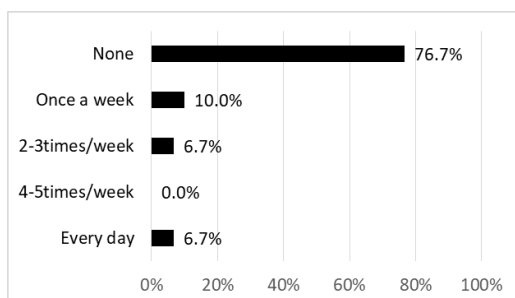
Source: Authors.

Figure 3.14. Smoking habits in the family
[N=30]



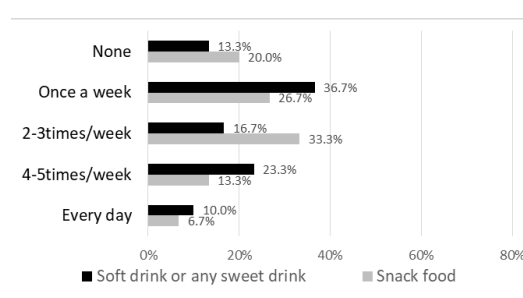
Source: Authors.

Figure 3.15. Drinking frequency
[N=30]



Source: Authors.

Figure 3.16. Frequency of snacks and sweetened drinks
[N=30]



Source: Authors.

3) Objective measures and health literacy

We compared their BMIs with their self-assessments of their body shapes (thin, normal, or fat). A statistical test showed that the self-assessment was significantly related with the actual BMIs ($p < 0.05$, Fisher's exact test), but 11 in 16 study participants whose BMIs were categorised as overweight according to WHO's cut-off point assessed themselves as within the normal range rather than 'fat' (Table 3.3).

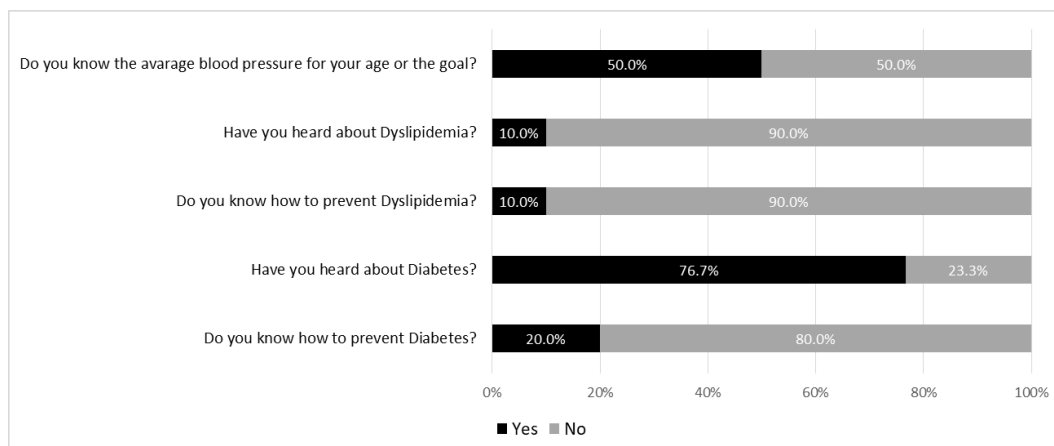
Table 3.3. Body mass index and self-assessment of body shape (Lao PDR) [N=30]

		Self-assessment		
		Thin	Normal	Fat
BMI (kg/m ²)	<18.5	1	0	0
	18.5–25	4	8	1
	25≤	0	11	5

Source: Authors.

About half of the study participants were aware of the average or ideal blood pressure for their age. Awareness of hyperlipidaemia was low (10.0%), whilst 23 study participants (76.7%) had heard about diabetes. Nevertheless, only six participants (20%) knew about preventive measures against diabetes (Figure 3.17).

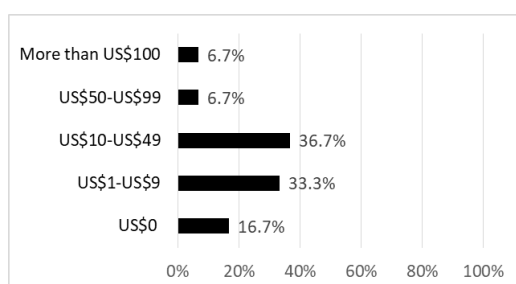
Figure 3.17. Awareness of lifestyle diseases and prevention measures (Lao PDR) [N=30]



Source: Authors.

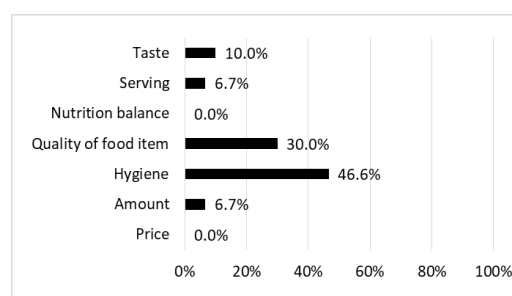
Regarding the payable amount for health, 11 study participants (36.7%) answered they could spend US\$0–US\$49 (36.7%), followed by US\$1–US\$9 (33.3%), and none (16.7%) (Figure 3.18).

Figure 3.18. Income available for use on healthcare (Lao PDR, per month) [N=30]



Source: Authors.

Figure 3.19. Most important point when selecting food (Lao PDR) [N=30]



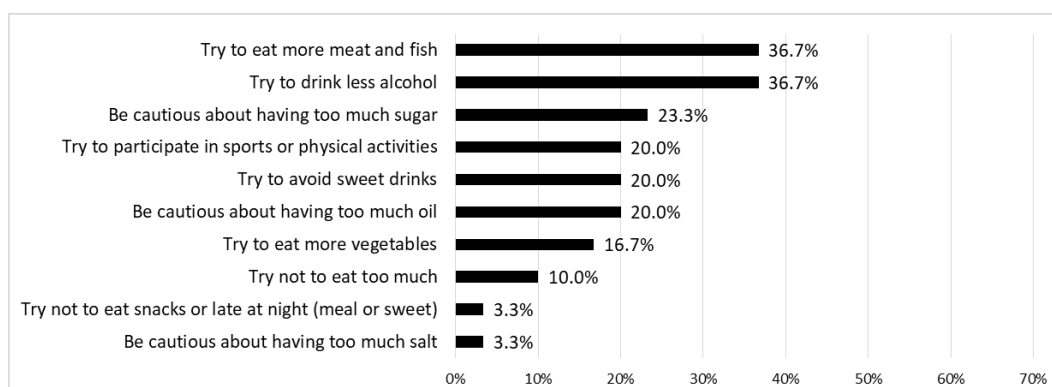
Source: Authors.

4) Awareness of a healthy diet

To the question ‘what is the most important point when selecting food?’, about half of the study participants (46.6%) answered ‘hygiene’, followed by ‘quality of food item’ (30%). No-one answered that ‘nutrition balance’ or ‘price’ was the most important (Figure 3.19).

Of the 30 respondents, 19 reported that they were concerned about health. Regarding the practices carried out by the study participants to promote health, the most common answers were ‘try to eat more meat and fish’ and ‘try to drink less alcohol’ (36.7%), followed by ‘be cautious about having too much sugar’ (36.7%). The answer of ‘be cautious about having much salt’ was one of the least common answers (3.3%) (Figure 3.20). We also asked about supplement intake. Only one study participant answered that they take a supplement regularly, followed by ‘sometimes’ (43.3%), and ‘never’ (53.3%).

Figure 3.20. Practices for health promotion (Lao PDR) [N=30, Multiple answers with a maximum selection of three items allowed]

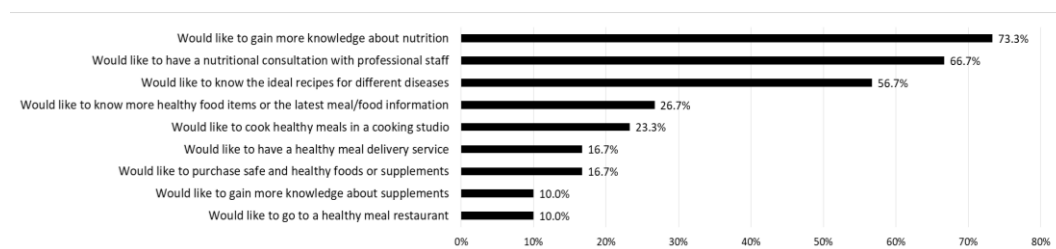


Source: Authors.

5) Interest in dietary services

For the question about the diet-related services that the study participants hoped to use, the most common answer was ‘would like to gain more knowledge about nutrition’ (73.3%), followed by ‘a nutritional consultation with professional staff’ (66.7%), and ‘would like to know the ideal recipes for different diseases’ (56.7%) (Figure 3.21).

Figure 3.21. Interest in dietary services (Lao PDR)
[N=30, Multiple answers with a maximum selection of three items allowed]



Source: Authors.

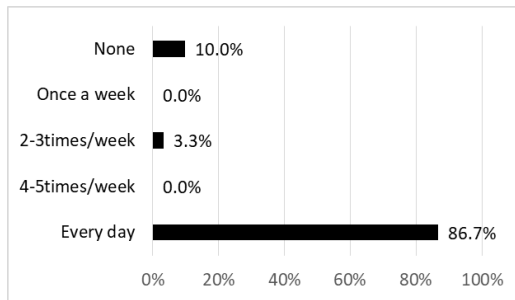
Viet Nam

1) Daily routines and times

The most common wake-up time of the study participants was 6am (33%), and the most common bedtime was 10pm (43%). The average sleeping time was 8.48 hours. The most common times for meals were 7am (53%) for breakfast, 11am (67%) for lunch, and 6pm (40%) for dinner. The results suggest that most of the participants would be awake for several hours from dinnertime to bedtime, without going to sleep immediately after dinner. Too short a time from dinner to sleeping is considered to negatively affect health status.

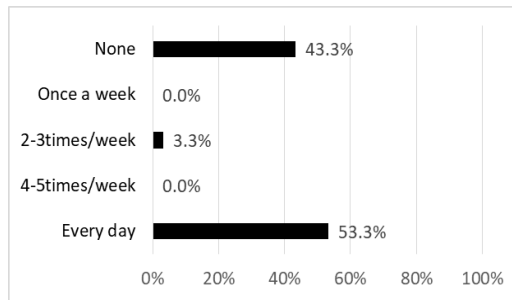
Twenty-six study participants (86.7%) reported they exercised every day, one participant answered 2–3 times a week, whilst 10 participants did not exercise routinely (Figure 3.22). About half of the study participants reported they took snacks every day (53.3%), whilst another half did not have a snacking habit (43.3%) (Figure 3.23).

Figure 3.22. Exercise habits [N=30]



Source: Authors.

Figure 3.23. Snacking habits [N=30]



Source: Authors.

We collected 12 photos of breakfast, 13 lunch photos, and 13 dinner photos from 14 respondents through a photo survey. Noodles were the most common type of staple food for breakfast, whilst rice was the most common for lunch and dinner. We concluded that 92% of the study participants took only staple foods for their breakfast, but it should be noted that meat and vegetables were often put in the noodle dishes. Particularly, meat was very often found in noodles for breakfast. At lunch and dinner, they mostly had either a main dish or side dish, or both, as well as a staple food. Their lunch and dinner generally had many dishes and were rich in vegetables. It seemed that meat was preferred to fish.

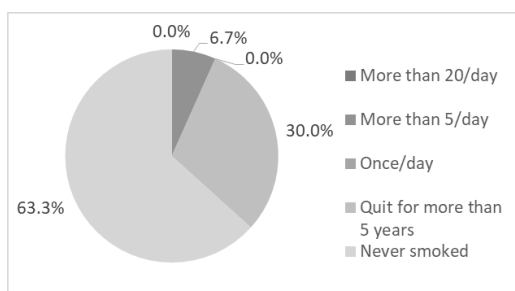
2) Other habits

Nineteen study participants (63.3%) answered they had never smoked, whilst nine participants (30.0%) reported that they had quit smoking for more than 5 years. Only two participants (6.7%) still smoked, of which all of them reported they smoked more than 5 cigarettes per day (Figure 3.24). Regarding smoking within their family members, seven study participants (23.3%) answered that they had family members who smoked (Figure 3.25).

Twenty-six study participants did not have an alcohol-drinking habit (Figure 3.26).

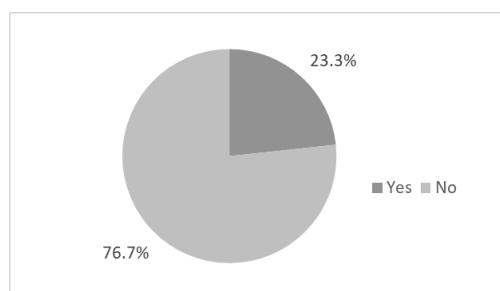
Most participants answered they did not have a snacking habit (80.0%), whilst about half of the participants had the habit of drinking sweetened drinks (Figure 3.27).

**Figure 3.24. Smoking habits
[N=30]**



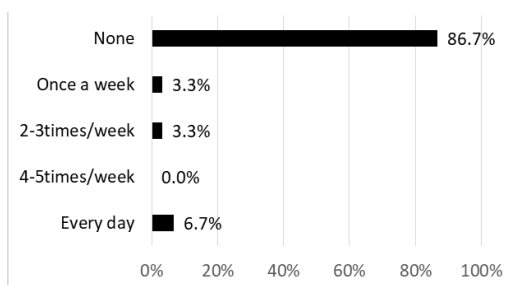
Source: Authors.

**Figure 3.25. Smoking habits in the family
[N=30]**



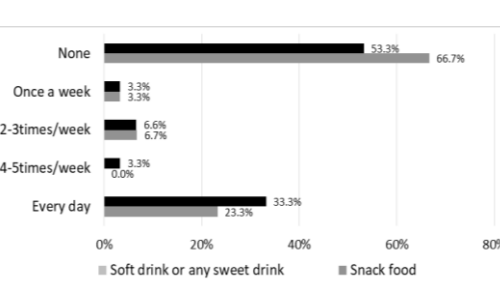
Source: Authors.

**Figure 3.26. Drinking frequency
[N=30]**



Source: Authors.

Figure 3.27. Frequency of snacks and sweetened drinks [N=30]



Source: Authors.

3) Objective measures and health literacy

Table 3.4 is a cross-tabulation of their BMIs and the results of their self-assessment of their body shape: thin, normal, or fat. Self-assessment was significantly related to their actual BMI values ($p < 0.05$, Fisher's exact test), but the participants whose BMIs were within a normal range were likely to assess themselves as having a 'thin' body shape rather than 'normal'.

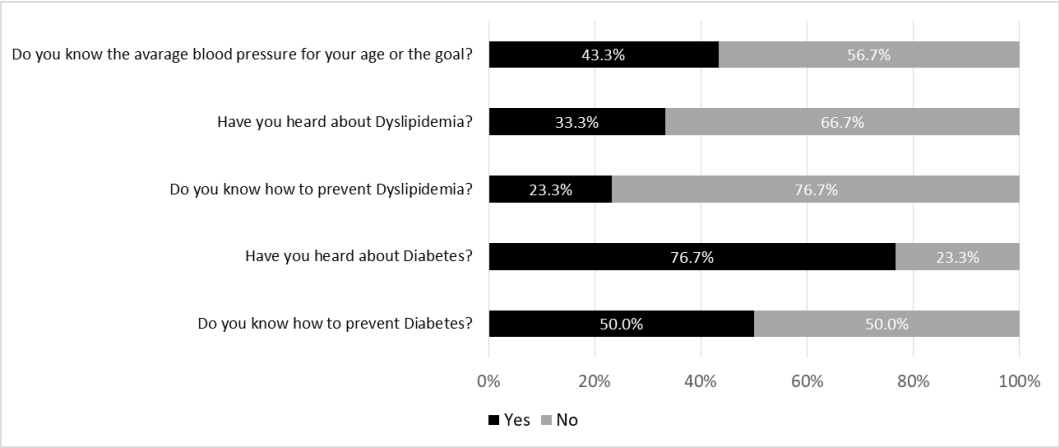
Table 3.4. Body mass index and self-assessment of body shape (Viet Nam) [N=30]

		Self-assessment		
		Thin	Normal	Fat
BMI (kg/m ²)	<18.5	4	2	0
	18.5–25	8	7	3
	25≤	0	2	4

Source: Authors.

Awareness of hyperlipidaemia was low. Only 10 study participants (33.3%) were aware of it, whilst they were more aware of diabetes; as many as 23 participants (76.7%) had heard about diabetes (Figure 3.28).

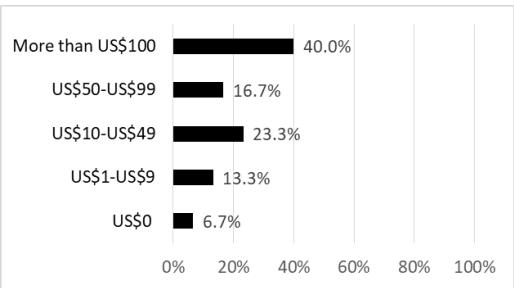
Figure 3.28. Awareness of lifestyle diseases and preventive measures (Viet Nam) [N=30]



Source: Authors.

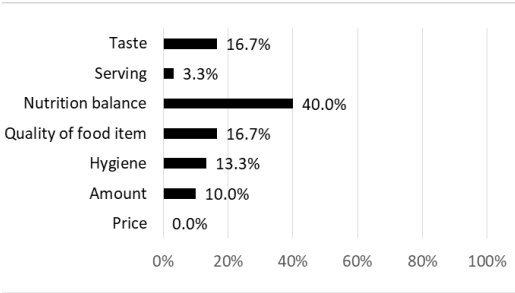
Regarding the amount of money available to spend on health each month, 12 study participants (40.0%) answered they could spend more than US\$100, followed by US\$10–US\$40 (23.3%) and US\$50–US\$99 (16.7%) (Figure 3.29).

Figure 3.29. Income available for use on healthcare (Viet Nam) [N=30]



Source: Authors.

Figure 3.30. Most important point when selecting food (Viet Nam) [N=30]



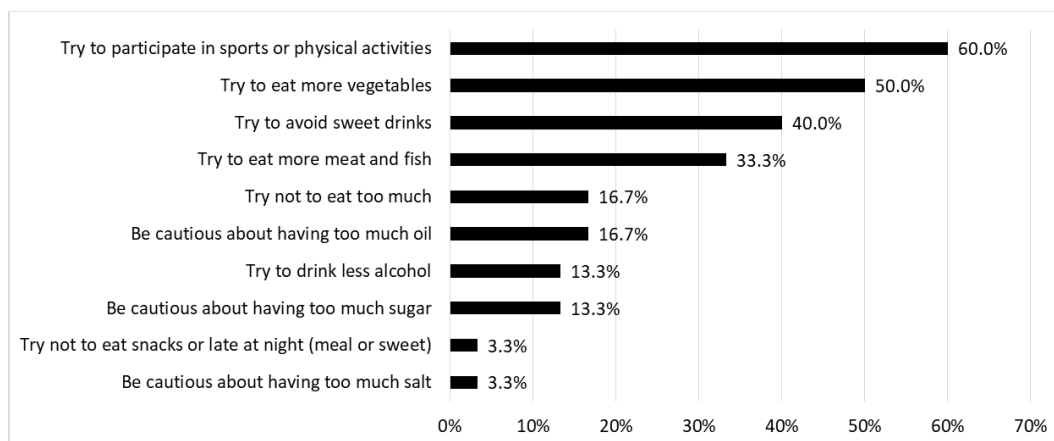
Source: Authors.

4) Awareness of a healthy diet

To the question about the most important point when selecting food, 12 study participants (40.0%) answered that nutritional balance (40.0%) was the most important, followed by taste (16.7%) and the quality of ingredients (16.7%) (Figure 3.30).

Of the 30 respondents, all study participants reported that they cared about their health. Regarding their practices for promoting their health, the most common answer was ‘try to participate in sports or physical activities’ (24.0%), followed by ‘try to eat more vegetables’ (20.0%), and ‘try to avoid sweet drinks’ (16.0%) (Figure 3.31). Seventeen study participants (56.7%) regularly took supplements, whilst 11 participants (36.7%) took no supplements.

Figure 3.31. Practices for health promotion (Viet Nam)
[N=30, Multiple answers with a maximum selection of three items allowed]

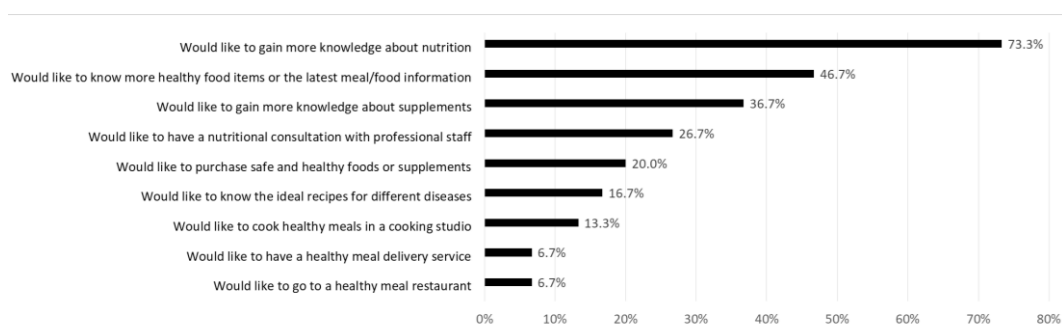


Source: Authors.

5) Interest in dietary services

To the question about the diet-related services that the study participants wanted to use, the most common answer was ‘would like to gain more knowledge about nutrition’ (73.3%), followed by ‘would like to know more healthy food items or the latest meal/food information’ (46.7%) and ‘would like to know more about supplements’ (36.7%) (Figure 3.32).

Figure 3.32. Interest in diet-related services (Viet Nam)
[N=30, Multiple answers with a maximum selection of three items allowed]



Source: Authors.

(6) Summary and discussion

The results of this study should be interpreted carefully. First, the sample size is very small. The sample does not represent the whole population of each country because the participants of this study were selected from the patients suffering from stroke (all participants in Cambodia and Lao PDR) or head injury (most participants in Viet Nam). The socio-economic background of the sample also does not represent each study country as the study in Cambodia was conducted in a private hospital, whilst in the Lao PDR and Viet Nam, the study was done in national hospitals.

Even if such limitations of this study are taken into consideration, some common trends could be found in all three countries. Awareness of lifestyle-related diseases was not high, particularly for hyperlipidaemia and its preventive measures. It seems salt intake was not seriously considered as a factor affecting their health. Considering the widely approved evidence that the incidence of stroke is closely related to hyperlipidaemia and/or salt intake and that most participants of this study were stroke patients, raising the awareness of lifestyle-related diseases and the harm of a high salt intake may have the potential to improve the health outcomes in these three countries. Luckily, the study participants of all three countries commonly showed keen interest in nutrition. Programmes to promote the modification of their eating habits are encouraged to prevent lifestyle-related diseases, considering each country's food-related culture.

3.2. Nutritional support at hospitals in Cambodia, the Lao PDR, and Viet Nam

Malnutrition in hospitalised patients is a common problem worldwide. Southeast Asia is not an exception. A survey in Ho Chi Minh City estimated the prevalence of hospital malnutrition amongst adults to be 34.1% (Tran, Banks, Hannan-Jones, et al., 2018), whilst in Lao PDR, it was 47% (Wilson et al., 2020). Because malnutrition considerably affects patients' recovery, hospital meals are provided as part of standard care in most high-income countries, but in other settings, hospital meals are not necessarily covered within

the standard package of hospital care. For example, in Viet Nam, hospital meals are not covered by public medical insurance (Tran, Banks, Do, et al., 2018). In response to such critical importance of nutrition in hospital care, nutrition support programmes, in some cases called ‘nutrition therapy’, have been provided in hospitals since the late 20th century, but few reports on such programmes could be found for Cambodia, the Lao PDR, or Viet Nam. The only one was a short report from Cambodia about the activities of the National Paediatric Hospital of Cambodia, which was carried out in collaboration with a Japanese foundation (Ly, Saito, and Kusama, 2015). In this section, the results of our surveys will be shown for the systems of nutrition management of selected hospitals in Cambodia, the Lao PDR, and Viet Nam as well as the available human resources for nutrition management in those hospitals. A capacity building programme for nutrition management that we conducted under this project is also reported.

(1) Nutrition guidelines

Cambodia

In 2017, a book titled ‘Recommended Dietary Allowance and Food-Based Dietary Guidelines for School-Age Children’ was published by the Ministry of Health and the Foundation for International Development/Relief (FIDR), a Japanese organisation (FIDR, Khim, and Kusama, 2017). The book can be used even for hospital settings but was designed to provide guidelines for the energy and nutrient intake only for school-aged children. As far as we searched, no guidelines on hospital diet designed for adults could be found.

Lao PDR

At any national hospital in the Lao PDR, the department of nutrition is organised and some physicians and nurses are affiliated with it, but hospital meals are not provided. Only nutritional guidance is provided to inpatients and outpatients. There are no government guidelines on nutrition yet.

Viet Nam

Several guidelines on nutrition management in hospitals have already been issued by the Ministry of Health. In a circular note issued by the Ministry of Health in 2011, hospitals of Level III and above, including special public hospitals, were directed to establish a department of nutrition and a clinical nutrition centre, whilst other hospitals were directed to establish a department or team of nutrition. The details of setting up the nutritional department or team are also described in the circular note (Ministry of Health of Viet Nam, 2011). Regarding hospital meals, the Minister’s Decision on the ‘Guideline of Hospital Diet’ was issued in 2006. Hospitals are required to provide meals in line with this guideline. Many types of hospital meals that are suitable for different conditions of patients are provided in this guideline, with details of the standard amount of intake for energy, protein, fat, carbohydrates, micronutrients, and liquids, etc. in accordance with the patient’s conditions, such as renal failure (acute, chronic, etc.), diabetes, cardiovascular diseases, gastrointestinal diseases, etc. (Ministry of Health of Viet Nam, 2006).

(2) Hospitals visited in Cambodia

a. National Paediatric Hospital

This hospital has about 300 patient beds. Three physicians are appointed as members of the nutrition department.

i. Practice of nutrition management

After screening children for malnutrition by physical measurement at the outpatient hospital ward, the physician prepares a nutrition care plan for children deemed undernourished and for patients who need nutritional counselling. The content of the dietary counselling and the food provided at the hospital can be modified to each child in accordance with the result of the nutritional assessment.

In this hospital, if a patient is detected as undernourished according to body weight and height either as an outpatient or inpatient, the information on the patient is shared with the nutrition department. Also, if physicians or nurses find any patients who need nutritional intervention, they notify the department of nutrition.

Nutrition management during hospitalisation is free. Nutrition counselling for outpatients takes 20–30 minutes per visit and is charged at US\$10 per visit. In September 2019, they provided nutrition counselling services for 74 outpatient cases (average two cases per day).

ii. Hospital meal services

This hospital provides hospital meals, about 200 to 300 meals per day in total. No additional payment is required for patients who are 6 months old or older.

The hospital provides several kinds of therapeutic diet besides a regular diet, such as a soft diet, full liquid diet, complementary feeding diet (CFD), high energy high protein diet (HEHP), and low salt diet.

The food menu used to be prepared in accordance with the common practice of other ASEAN Member States. Since the Cambodia's own guideline for nutrition intake was published and certified by the Ministry of Health of Cambodia in November 2017, a menu is being prepared in accordance with the new Cambodian guideline (Foundation for International Development/Relief, 2019).

Patients can learn how each type of therapeutic diet is prepared including nutritional composition at notice boards with photos.

Hospital meals were not provided before the support of the FIDR started in 2006. A meal ordering system was introduced with the support of the FIDR, which enables the ordering of hospital meals for individual patients by calculating the nutrient composition.

Posters on the walls of the kitchen show the amount of food for each type of diet using pictures of spoons and dishes so that everyone can understand the designated amounts.

b. Sunrise Japan Hospital Phnom Penh

This is a hospital with 50 patient beds. The hospital does not have a special department in charge of nutrition management, but a Japanese registered dietitian based in Japan is involved with the management of hospital meals.

i. Practice of nutrition management

No screening of nutrition is carried out by doctors and nurses, but nurses are trying to develop a screening system in response to local needs.

For inpatients, nutrition counselling services are provided by nurses to the patients who are assumed to be in need, but systematic nutrition counselling services have not been developed.

For outpatients, a Japanese nurse who has received training from a nationally registered dietitian in Japan shares how to provide nutritional counselling services with Cambodian nurses. This service is included in the comprehensive package of health check-ups of this hospital. Before the counselling, patients are asked about their food habits and daily living habits, including exercise. If an imbalance is observed in their food habits, recommendations are provided to them on how their nutritional balance can be improved for health promotion, particularly for reducing sugar volume.

ii. Hospital meal services

This hospital has been providing hospital meals since its establishment in 2016, about 15 meals per mealtime, with the belief that food is a part of treatment. The fee is included in the hospitalisation fee package.

The hospital provides 16 types of diet. The menu is jointly prepared by a local chef and a Japanese registered dietitian. The dietitian is based in Japan but remotely plans the menus based on the calculation of the nutritional composition that is required for a standard diet and each type of therapeutic diet. Meals are served to each patient in accordance with the clinical conditions of the patients. Food forms can be modified, such as chopped or in a paste, etc. For lunch, the patient can choose their meals from two options, Khmer or Japanese. A special meal is provided on the occasion of an event once a month.

Kitchen staff visit the hospital wards during lunchtime and listen to the opinions and impressions of patients on the food. This is reflected in the menu.

For patients who need tube feeding, meals are prepared at each ward.

Hygiene education by an external company is carried out for kitchen employees once a year.

(3) Hospital visited in the Lao PDR

Mahosot Hospital

One of the major national hospitals located in Vientiane. The hospital has a nutrition department. Several physicians and nurses are assigned at the department. Their tasks are the following.

- Meeting with patients to understand their treatment and condition
- Counselling for inpatients and outpatients
- Evaluation of the nutritional condition of the inpatients and outpatients
- Diet recommendations according to the condition of the inpatients and outpatients
- Activities to raise the awareness of nutrition management

i. Practice of nutrition management

Anthropometric measurements and blood tests are carried out upon hospital admission to detect patients who need nutritional counselling.

Nutritional counselling services are provided for patients with lifestyle-related diseases, particularly diabetes, who are undernourished and who need tube feeding. The daily number of nutritional counselling cases is approximately 30–50 per day. The time for one session is 1 hour. They provide more than 5,000 sessions a year. Of the total clients, 25% are children. Follow-ups are regularly carried out when patients visit as outpatients.

For patients with lifestyle-related diseases, recommended intake amounts according to their disease conditions are shared using diagrams and photos with the amount of salt and sugar contained in the foods.

For undernourished patients, a nutrition composition chart is shown to let them know what kinds of foods contain ideal nutrition with proper balance.

The nutrition department has a meeting to discuss the treatment and nutritional condition of the patients every morning.

ii. Hospital meal services

Hospital meals are not provided. The hospital does not have a kitchen. Meals are brought to the patients by their families.

(4) Hospitals visited in Viet Nam

a. Viet Duc University Hospital

A public hospital which has the largest surgical centre in Viet Nam. The hospital has more than 1,500 patient beds. The nutrition department was established in 2018 and 10 physicians, five nurses, and two dietitians are assigned. The department consists of a nutritional management section and kitchen section. Both sections have a morning meeting at 7:00–8:00 am every morning and visit each ward from 8:00 for half an hour.

The job descriptions of the nutritional management section are the following.

- Counselling for inpatients and outpatients
- Diet recommendations according to the condition of the inpatients
- Preparation of the menu
- Activities to raise the awareness of nutrition management

i. Practice of nutrition management

The nutritional assessment of inpatients is carried out within 24 hours after hospital admission by physicians or nurses using a guideline. The information on the cases requiring nutritional intervention is shared with the department of nutrition. In addition, the staff of the nutrition department visit the ward and collect the patients' information from ward nurses. Nurses from the nutrition department are stationed in the wards of digestive surgery, neurosurgery, and cardiac surgery,

The nutritional status of all patients is recorded using an assessment form, but it is not fully utilised because many patients leave the hospital before the forms are brought to the nutrition department.

For the patients who need tube feeding, physicians provide nutritional prescriptions and nurses prepare and provide meals. The staff of the nutrition department provide advice to physicians when physicians choose a product for tube feeding and determine the amount of feeding. Besides the patients who need tube feeding, the nutrition department also provides advice regarding nutrition management for some other patients in the ward.

Nutritional counselling services can be provided upon the order of physicians or the request of the patients. The hospital provides two types of nutritional counselling sessions: a group session and an individual session. Group counselling is given mainly to neurosurgery patients. One session accommodates about 60 people in the case of neurosurgery patients and about 20 people for other patients. Individual counselling is offered to the patients of cardiovascular surgery, liver or gastrointestinal surgery, and urology. Patients are not required to make any additional payment for nutritional counselling services. Nutritional counselling is not provided to outpatients, even for those who left the hospital.

The hospital has not developed a surveying system to assess the effect of the nutritional counselling service. Efforts to improve the quality of this service are encouraged as well as discussions on whether the free counselling service can be sustainable or not if the quality of the counselling service is to be improved.

ii. Hospital meal services

This hospital has 27 types of hospital meals, including therapeutic diet meals, and serves 300–400 meals per mealtime. Patients are provided with the opportunity to select a meal type from two options if they are regular meal eaters. The menu is prepared by the staff of the nutrition department every week.

Meals are not covered by insurance, so the cost is billed to the patient.

The price varies by meal type, and the price is determined by negotiations between the hospital and the company consigned for providing hospital meals.

b. Bach Mai Hospital

One of the largest hospitals in Viet Nam in terms of the number of patient beds (1,900 beds according to the website), and it is the leading referral general hospital in Ha Noi. The department of nutrition was established in the late 1990s. Twenty-three staff members are assigned, including physicians and registered dietitians. Some staff in the department have the PhD degrees in nutritional science.

The nutrition department is part of the clinical nutrition centre, which consists of four sections: administration, food safety, nutrition consultant, and nutrition support team (NST). Several NSTs are organised, and one NST is responsible for two or three wards (200 to 300 patients). NSTs are also in charge of the training of the students learning nutritional management as well as the suggestion of new menus based on their surveys. The department holds daily morning meetings to share important information with the entire staff of the department. They have also created a social media group to share the information with not only the staff of the nutrition department but also physicians, nurses, pharmacists, rehabilitation staff, etc. so that they can share the patients' information.

i. Practice of nutrition management

The nutritional condition of all patients is assessed within 24–36 hours after hospital admission by a physician or nurse. The information on the cases requiring nutritional intervention is shared with the supervising staff of the department of nutrition. Nurses are supposed to monitor the condition of food intake of the patients. They review the nutritional status and food intake of patients every other week. In case they find any problems, the information is notified to the nutrition department. The hospital still uses paper-based medical charts, so the staff of the nutrition department need to visit the wards to check the status of the patients as well as the results of laboratory tests. The hospital does not provide any specific interventional approach to patients who depend on tube feeding.

Nutritional counselling services are provided. The hospital has three types of services: lectures or seminars, group counselling sessions, and individual counselling sessions.

Lectures and seminars are held upon request by each department on an ad hoc basis. Group sessions are provided to patients of diabetes, chronic renal failure, and cardiovascular diseases, mainly. Individual sessions are for patients of the rehabilitation

department, neurosurgery, ICU, emergency, traditional medicine, cardiovascular diseases, and infectious diseases. Requests for nutritional counselling are made by physicians or patients themselves.

No additional payment for nutritional counselling for inpatients is required. For outpatients, D70,000 is charged for one house session.

The demand for the nutritional counselling for dysphagic patients is growing because of population ageing. For dysphagic patients, the department provides advice on points to be kept in mind at the time of swallowing and cooking. The severity of dysphagia is assessed using grading scales.

The staff of the nutrition department recognise the importance of nutrition management for contributing to health promotion and hope to improve the quality of their activities and expand the services, but because of the shortage of staff, it is not possible. The low service fee for nutritional counselling, i.e. D70,000 at this hospital, might be one of the reasons for the shortage of human resources.

ii. Hospital meal services

This hospital has the capacity to provide about 300 types of hospital meals, including therapeutic diet meals, and serves about 1,400–1,500 meals a day. Amongst them, about one-fifth is for tube feeding. Physicians are supposed to determine the appropriate meal type for each patient, but they sometimes consult other staff on this to serve the most appropriate food in accordance with the condition of a patient. The hospital is trying to increase the number of meal types in response to requests from the patients.

Meals are not covered by insurance, so the actual cost is billed to patients; about D2,000–D3,000 depending on the meal type.

For tube feeding, both commercial products and food prepared at the hospital are used. Physicians decide which is provided to patients.

The hospital tries to serve hospital meals to all the inpatients, but currently it is about 70%.

Two staff members of the nutrition department are sent to the kitchen to supervise the kitchen staff for correct preparation and hygienic control.

c. **Hospital K (Vietnam National Cancer Hospital) – Campus 3**

Viet Nam's leading cancer hospital located in Ha Noi. The hospital has three campuses within Ha Noi city. We visited Campus 3 of Hospital K.

The nutrition management department is called the 'nutrition centre'. About 10 staff members are assigned to the department, including nutrition doctors. Amongst the three campuses of Hospital K, only Campus 3 has a nutrition management department.

i. Practice of nutrition management

Nutritional assessment for inpatients is performed by physicians or nurses within 24–36 hours after admission. The result of the assessment is graded depending on the expected risk of malnutrition, and information on patients at a high risk is shared with the nutrition centre.

ii. Hospital meals service

Campus 3 provides about 250 hospital meals per mealtime. For tube feeding, both commercial products and meals prepared at the hospital are used.

d. Hospital for Tropical Diseases

A major referral hospital for tropical diseases located in Ho Chi Minh City. The nutrition department of this hospital has one physician, one nurse, and two nutrition experts. The physician had received training of nutrition management for 6 months at Ho Chi Minh Medicine and Pharmacy University.

i. Practice of nutrition management

Assessment is carried out for all patients using a special form for the assessment of nutritional status. Nutritional counselling services are provided to patients who have diabetes and/or high blood pressure. Additional payment for nutritional counselling is not charged.

ii. Hospital meal service

Hospital meals, two types of rice porridge, and smoothies only, are prepared in the kitchen of the nutrition department but provided only to the patients in a serious condition. About 40 meals are served per mealtime, six times a day. The daily fee for a hospital meal is D300,000. About half of the patients have food that is brought from outside the hospital, whilst 35% of the patients eat at the restaurant in the hospital, and the rest are served hospital meals. Most patients are discharged within 3–4 days after admission.

(5) Results of questionnaire survey on hospital nutritional management in Viet Nam

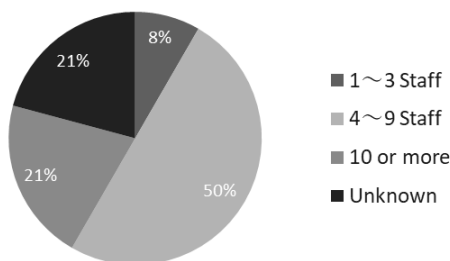
We co-hosted a workshop on 21 March 2019 in Ha Noi, with the title, 'Nutrition Workshop: Meal Intervention from Multiple Viewpoints' together with Viet Duc University Hospital. The objective of the workshop was to share the practice and lessons of nutritional management in hospitals and to discuss how to improve nutritional management. The workshop was attended by 276 participants from both Japan and Viet Nam. The participants were the staff of the nutrition department and rehabilitation department, nurses, and physicians, etc. About 10% of the participants were from Japanese organisations. Presentations were given by physical therapists, speech therapists, and dietitians to share the practices of nutritional management in both countries.

On this occasion, we conducted a questionnaire survey regarding the department of nutrition and meal provision at each hospital. A questionnaire was distributed to the Vietnamese participants, and 24 of them answered. The respondents were from 3 national hospitals, 12 regional hospitals, 5 rehabilitation hospitals, and 1 geriatric facility. The affiliations of some respondents were undefined. Each respondent was affiliated with a different hospital or facility.

Out of the 24 respondents that participated in the survey, 20 respondents answered that their hospitals had already established department of nutrition and had dedicated staff for nutritional management. Half of the respondents reported that their facilities had 4–9 staff assigned at a nutrition department (50.0%), followed by 10 persons or more (20.8%) (Figure 3.33).

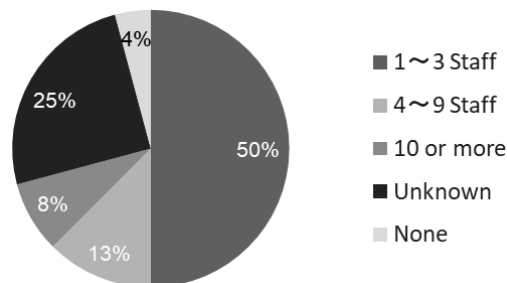
As for the number of the staff who were employed exclusively for the work of the nutrition department, the most common answer was 1–3 staff (50%), followed by 4–9 (12.5%) (Figure 3.34).

Figure 3.33. Number of nutrition department staff in the hospital [N=24]



Source: Authors.

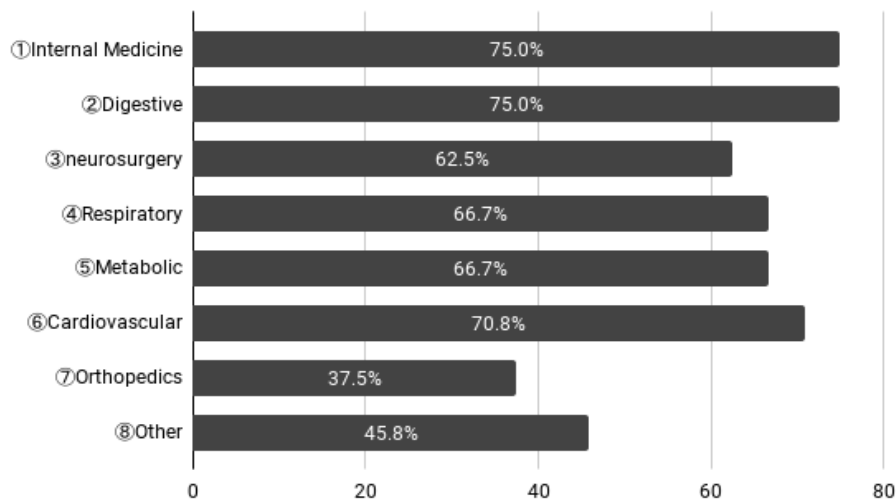
Figure 3.34. Number of staff exclusively assigned to the nutrition department [N=24]



Source: Authors.

We asked the respondents whether their facilities provided nutritional counselling services to patients of with following seven conditions (percentage of the respondents who answered ‘yes’): internal medicine (75.0%), digestive diseases (75.0%), neurosurgery (62.5%), respiratory diseases (66.7%), metabolic diseases (66.7%), cardiovascular diseases (70.8%), orthopaedics (37.5%) (Figure 3.35). Eleven hospitals (45.8%) reported that they provided such services for the patients of other diseases.

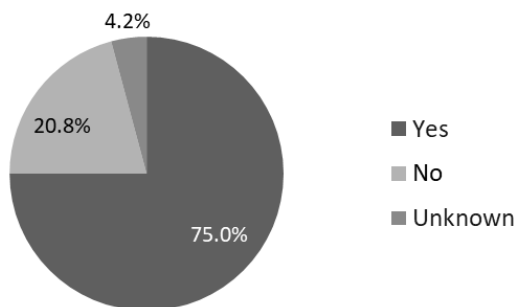
**Figure 3.35. Target patients for nutritional counselling
[N=24, multiple answers were allowed]**



Source: Authors.

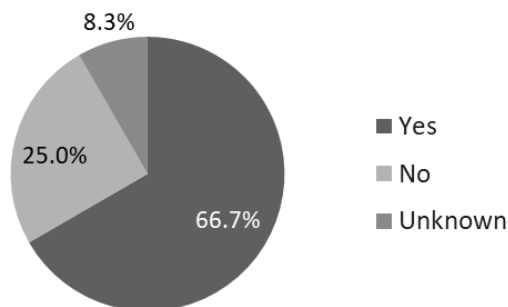
Eighteen out of 24 respondents reported that their facilities provided hospital meals within their facilities (Figure 3.36).

**Figure 3.36. Provision of patient meals
within hospitals**



Source: Authors.

**Figure 3.37. Evaluation of swallowing
function**



Source: Authors.

Sixteen respondents reported that their facilities routinely performed an assessment of the swallowing function of patients (Figure 3.37).

Regarding the services provided to encourage the adequate food intake by the patients, 19 respondents answered that their facilities provided nutritional counselling services, 16 offered swallowing support, for example training of ideal posture to prevent mis-swallowing, and 17 provided services of cooking instructions for food that is ideal for patients with swallowing disorders.

As open comments, three respondents reported that their facilities did not practice any programme of nutrition management for patients. A comment which mentioned insufficient rehabilitation services for swallowing disorders in the country was also found.

3.3. Capacity building of human resources for nutritional management

(1) Cambodia

As of 2019, Cambodia does not have a training institution for dietitians nor a national certification system of dietitians. National Paediatric Hospital is the only national hospital that provides hospital meals in the country. The hospital has three physicians in charge of nutritional management. They were trained for 2 months in Japan with support from a Japanese NGO, FIDR, which provided support for the establishment of a nutritional management system, including the serving system of hospital meals.

During the project period of FIDR, a Japanese registered dietitian was assigned at the hospital to establish a nutritional management system as well as a hospital-meal providing system and to introduce an on-the-job training system for nutritional counselling.

(2) Lao PDR

As of 2019, the Lao PDR does not have a national certification system for dietitians nor an established job category for dietitians. The Lao PDR is, however, still affected by high levels of stunting and wasting and other forms of undernutrition (Chaparro, Oor, and Sethuraman, 2014), so the Nutrition Center was established under the Ministry of Health in 2012 and a four-month course to develop the human resources of nutritional management began with support from the United States. This course focuses on clinical nutritional management and accepts only physicians and nurses working at a hospital.

For each course, two staff are selected from each of the seven hospitals in Vientiane, including major hospitals and district hospitals, to attend the course. So far, 28 physicians and nurses have undertaken the course. The curriculum of this course is divided into public health nutrition (2 units), applied nutrition (21 units), and clinical nutrition (17 units).

Amongst the hospitals sending their staff to this course, only Mahosot Hospital has established a department of nutrition, and the staff who completed this course are assigned to the nutrition department. In other hospitals where a nutrition department has not yet been established, staff who complete this course are assigned to places where their knowledge can be well utilised. For example, in Mittaphab Hospital, such nurses are assigned to the 'Food and Medical Team' in the ICU. In 2019, the fourth-round course began in July. Besides the four-month course, a three-day course is also regularly held. This course is also for physicians and nurses and includes lectures on basic nutritional science.

(3) Viet Nam

The Ministry of Health of Viet Nam promulgated a decision dated 20 July 2010 to regulate the training programmes of nurses specialised in nutritional management. This decision provides the required components and time in detail, including the requirements for educational facilities and the assessment of the participants for programme completion (Ministry of Health of Viet Nam, 2010).

In October 2015, the Ministry of Health and the Ministry of Home Affairs issued a joint circular note that provided the official code and standards for the profession of 'nutrition'. It can be interpreted that the profession of 'nutrition' was officially recognised in Viet Nam (Ministry of Health and Ministry of Home Affairs of Viet Nam, 2015). Viet Nam has several training courses to create nutrition management professionals. The following are some examples.

a. Hanoi Medical University Nutrition Bachelor Course

In 2012, the Ministry of Education and Training issued a decision No.5158 to allow Hanoi Medical University to provide university-level education for nutritional science. In the following year, the Bachelor of Nutrition programme opened in Hanoi Medical University (Hanoi Medical University, n.d.). This programme is fully supported by a joint project between Viet Nam and Japan, i.e. the Vietnam Nutritional System Establishment Project (VINEP). This project was initiated with a joint study between the National Institute of Nutrition of Viet Nam and Ajinomoto Foundation, and later some other universities in Japan also joined in. The joint circular note of the Ministry of Health and Home affairs to recognise the profession of 'nutrition' is also a part of the achievement of this project (JICA and Ajinomoto Co., Inc., 2016).

In 2017, Hanoi Medical University produced 43 'dietitians' for the first time in Viet Nam. Of the graduates, 40% found jobs at hospitals, 20% work as assistants at research institutions like universities, and 30% at food companies.

Key components of the curriculum are anatomy and physiology in the first year; food chemistry, basic nutrition, and public health nutrition in the second year; and clinical nutrition in the third and fourth years.

Students are required to undergo practical training, such as cooking, nutritional counselling, and menu planning. Field practice of clinical nutritional management in a hospital is also required and it takes from 8 to 10 weeks. The curriculum was developed in collaboration with several Japanese universities, the Japan Dietetic Association, and Ajinomoto Vietnam Co., Inc. Some lectures are also delivered by Japanese experts affiliated with the universities that are involved with the development of the curriculum (Ajinomoto Co., Inc., 2017). The programme was also supported by the Abbot Fund Institute for Nutrition Science (Abbott, 2013). The graduates are encouraged to participate in academic conferences and workshops held in Hanoi Medical University to keep their knowledge updated.

b. Hanoi Medical University Short Course

Hanoi Medical University also provides a short course for nutritional management. These courses are designed to create physicians and nurses who have expert knowledge of nutritional management so that they can be assigned to a department of nutrition at hospitals after the completion of the courses.

Even after the completion of nutrition courses, since physicians are studying nutrition, both surgeons and physicians have knowledge of patient nutrition management. In fact, surgeons who have completed the nutrition courses are bringing improvements in nutritional management, such as the prescription of intravenous drips and information sharing with patients on nutritional conditions, etc. because of their expert knowledge of metabolism.

Hanoi Medical University accepts Japan's nationally registered dietitians as JICA's senior volunteers. They visit the university twice a year, observe each ward visited, and provide suggestions for the improvement of nutritional management.

c. Bach Mai Hospital

One-month, three-month, and six-month courses are provided for physicians and nurses from northern to central Viet Nam. The cost is D4,000,000–D4,500,000 per month. Courses are held year-round, and one class has 10–20 participants.

d. National Institute of Nutrition in Viet Nam

The National Institute of Nutrition in Viet Nam regularly organises training courses on clinical nutrition. The content of the courses varies from year to year. In 2021, for example, the official announcement mentions three courses will be held, and the content will be basic nutrition, nutritional interventions, nutritional counselling, etc. One-month, three-month, and six-month courses will be provided, but the six-month course can accept only professionals who have a strong background in nutritional management: dietitians with a bachelor's degree or other healthcare professionals who have already completed three-year courses. The cost will be D7,500,000 for the one-month course and D23,000,000 for the six-month course (National Institute of Nutrition, 2020).

3.4. Other activities to promote nutrition management and healthy food

(1) Cambodia

Japan Heart Children's Medical Center

'A volunteer-based international healthcare organisation', Japan Heart, established Japan Heart Children's Medical Center in 2016. The hospital acts as a referral hospital in the region and provides advanced medical services to patients, including those who require cancer treatment and/or paediatric surgery. The nutritional status of patients is regularly assessed because they are sure that the diet is closely related to health outcomes. The hospital meals are individually tailored, and the food centre works together with nurses

to make sure that diets are properly provided to optimise the outcomes of the treatment of each patient. The nutrition team also promotes hygienic management because it is still challenging to maintain food hygiene in Cambodia. They check the water chlorine level every morning and encourage patients to clean their hands before every meal (Japan Heart Children's Medical Center, n.d.).

(2) Lao PDR

a. National Nutrition Strategy to 2025 and Plan of Action 2016-20

The Lao PDR has one of the highest rates of malnutrition in Southeast Asia. The 2015 Lao PDR Child Anthropometry Assessment Survey (LCAAS) revealed half of all children in rural areas without public access were stunted (lower height for age below 2 standard deviations), whilst 23% of urban children were stunted. The same survey found that 6%–10% of children suffered from wasting (lower weight for height below 2 standard deviations) (World Food Programme and Ministry of Health Lao PDR, 2017). In response to this problem, the Government of the Lao PDR approved the first National Nutrition Strategy (NNS) in 2008 and set up the National Nutrition Center under the Ministry of Health in 2012, followed by National Nutrition Committee in 2013. The current NNS to 2025 and accompanying Plan of Action emphasise multi-sectoral unity and highlight the contribution of good nutrition to economic development. This NNS has four strategic directions and 11 strategic objectives (SOs): SO1 – improve nutrient intake; SO2 – prevent foodborne and waterborne infectious diseases under SD1 (immediate causes); SO3 – produce food for consumption; SO4 – improve access to nutritious food; SO5 – improve mother and child health practices; SO6 – improve clean water access, sanitation, and environment; SO7 – improve access to health and nutrition services under SD2 (underlying causes); SO8 – improve institutions and coordination; SO9 – develop human resources; SO10 – increase the quantity and quality of information; and SO11 – increase investments in nutrition interventions under SD3 (basic causes): SD4 on the linkage of relevant policies and strategies. This NNS was approved by all the relevant ministries, such as the Ministry of Health, the Ministry of Agriculture and Forestry, the Ministry of Education and Sport, and the Ministry of Planning and Investment, etc. (Government of the Lao PDR, 2015).

b. Micronutrient deficiency and insect farming

A Japan-based non-profit organisation, International Support and Partnership for Health (ISAPH), started their activities to improve the nutritional status of children in the Lao PDR in 2005. One of their most remarkable achievements is the reduction of infant mortalities. In their project area in Khammouane province, they found that the high infant mortality rate was caused by a thiamine deficiency and resulting infantile beriberi. After their interventional activities to improve the nutrition intake, not only the distribution of thiamine supplements but also the raising of awareness of the importance of balanced nutrition intake, the health status of the children of the project area was drastically improved (ISAPH, 2020a).

They have another project for nutritional improvement in the Lao PDR to promote insect farming. Some insects are nutrition-rich, so some insects can contribute to the improvement of the nutritional status of the people. This programme is supported by Ajinomoto Foundation as well as JICA (ISAPH, 2020b).

c. One thousand day programme

The programme is implemented in collaboration with the United Nations Children's Fund (UNICEF) Lao PDR, the Ministry of Health, and the Lao PDR Women's Union, aiming for the improvement of the nutritional status of infants and young children through the critical first 1,000 days of their lives. Stunted growth during this critical period can significantly affect the underdevelopment and the survival rate of children. This programme takes a broad approach to promoting care practices, such as exclusive breastfeeding until six months, ensuring children eat a diverse range of nutritious food beyond six months, handwashing, and hygiene practices. Micronutrient powder is also supplied, and the members of Women's Union give a cooking demonstration, showing how micronutrient powder can be added to different types of local food for best effect (UNICEF Lao PDR, 2017).

d. School feeding programme

Since 2006, the school feeding programme in the Lao PDR has been sponsored by the government of the United States. The programme provided hot lunches to 140,000 Lao PDR school children and succeeded in the increase of school enrolment, the improvement of nutrition, and even support for learning. It also helped strengthen the government's school meals programme. In 2018, using funds from the US government, a new school feeding programme was launched by the US government and the United Nations World Food Programme. During the new five-year activity, it is expected that the school meals project will provide opportunities for smallholder farmers, particularly women, to increase their production and sell produce directly to schools, which can diversify the children's meals (United States Embassy in the Lao PDR, 2018).

(3) Viet Nam

a. School meal project

This is a project launched by Ajinomoto Vietnam Co., Inc. in collaboration with the Ministry of Education and Training, the Ministry of Health, and local authorities. Viet Nam has a double burden of malnutrition, with stunting mainly in rural areas and overweight and obesity mainly in urban areas. The objectives of this project are to provide nutritionally balanced school meals nationwide and to develop dietary-education materials and kitchen models for the improvement of school-meal operations and hygiene management. The project has also developed an app for designing appropriate lunch menus, which can be easily used even by school staff who do not have expert knowledge of nutrition (Ajinomoto Co., Ltd., 2017).

b. Child nutrition improvement project in hill villages

The project was commenced by a Japanese NGO, FIDR, in 2012, which supported the nutritional management at Cambodia's National Paediatric Hospital as well. Their project site in Viet Nam was the hill villages of central Viet Nam, where undernourishment amongst children was still rampant. With the objective of improving the local people's knowledge of nutrition and hygiene, the project organised the 'Health Network Members', consisting of mothers and local health officers. They encouraged the people to grow high-nutrient local vegetables and held cooking classes for mothers and fathers. The project also focused on the improvement of the environment of 'mothers' places', such as the kitchen and bathroom. Such activities contributed to the improvement of hygienic conditions in houses and the prevention of diarrhoeal diseases (Foundation for International Development/Relief, n.d.).

3.5. Discussion

Discussions on nutritional management and the promotion of healthy food in Cambodia, the Lao PDR, and Viet Nam encompass a wide range of topics, such as how to improve food for undernourished children, food hygiene to prevent foodborne infectious diseases, and nutrition-balanced food to prevent non-communicable diseases. Stunting, wasting, and the high mortality of children caused by undernutrition is still common in these countries, particularly in rural areas and amongst ethnic minorities. The programmes to improve the nutritional status of children are actively being conducted in cooperation with international organisations as well as civil organisations. These countries, however, have a double burden. As a result of the social change coupled with economic development, their eating habits are drastically changing, particularly in urban areas. Overweight, obesity, and the resulting non-communicable diseases have been recognised as one of the new challenges for healthcare systems. The promotion of a nutrient-balanced food intake should be strengthened, but the human resources to take on this work are still developing. Improving on the availability of nutritional management and counselling professionals in hospitals to provide ideal meals for the quick recovery of patients are also needed. Even amongst healthcare professionals, such as physicians and nurses, the importance of nutritional management has not been familiarised enough.

Considering the great impact of malnutrition on both children and older people, an urgent response to the nutrition-related challenges would be required in Cambodia, the Lao PDR, and Viet Nam. This chapter showed several practical programmes for nutritional management and the promotion of healthy food. As shown in most of these examples, nutritional management is linked to various aspects from medicine to education, culture, and social issues, etc. A multi-disciplinary and cross-sectoral approach would be encouraged to achieve a better nutritional status for the improvement of children's health and for the prevention of non-communicable diseases and the resulting disabilities of the older population.

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Chapter 4

Conclusions and Recommendations

Promotion of a 'broad-based healthcare system'

The second term of this project focused on chronic-phase rehabilitation and nutritional management at hospitals in Cambodia, Lao PDR, and Viet Nam in line with the concept of a 'broad-based healthcare system' based on the Asia Health and Wellbeing Initiative of the Government of Japan (Government of Japan, 2018).

All the study countries recognise the importance of the promotion of active and healthy ageing, but social security systems are still developing. Long-term care is mainly provided by family members, relatives, and community members. The results of the questionnaire survey and case studies that were carried out under this project suggested that the family members spent a lot of time on caregiving, and it could be a physical and economic burden. Professional services for chronic-phase patients, such as nursing homes, home-visit nursing, and home-visit rehabilitation, are very limited. On the other hand, the people in the study countries still have strong filial piety and dearly wish for the recovery of the patients through rehabilitation so that they can resume their functions to live independently.

As seen in most countries globally, the study countries also have considerable disparity in the capacities of medical services and human resources between urban areas and rural areas. In such conditions, a coordination system between urban and rural and/or from acute to chronic care would be crucially important to optimise the limited resources, but this is very challenging. For example, it has been difficult to share information on patients amongst hospitals or staff so far, but the government might be able to develop a system that facilitates the seamless transition from acute care to chronic care. Information technology has the potential to contribute to the development of such a system.

Regarding the human resources of chronic-phase rehabilitation and nutritional management, the study countries have limited personnel who can handle them. For example, hospital staff, physicians, nurses, and even physical therapists, etc. rarely care for the patients who have already left, and the family members of patients are not usually trained how to care for and how to provide home-rehabilitation for disabled people. The concept of a 'broad-based healthcare system' is supposed to promote not only the recovery and the improvement of the physical functions of the patients but also the improvement and modification of the living environment so that older people and people with disabilities can live more independently. The healthcare authorities and other stakeholders can be encouraged to promote awareness of the importance of chronic-phase rehabilitation and nutritional management to both healthcare professionals and the public.

Potential of digital technology for the development of healthcare systems

The health status and required healthcare services in the study countries are different from country to country, between urban and rural areas, between the high- and low-income population, and amongst ethnicities. During rapid economic growth and accompanied social change, the problem of the double burden would emerge, and the study countries have diverse health problems, from undernourished children and endemic infectious diseases to overweight, some habits harmful to health, and non-communicable diseases. The governments of these countries would be required to improve their healthcare systems to cover such diverse problems. The concept of a 'broad-based healthcare system' also aims to address such complicated challenges. This study showed the potential of chronic-phase rehabilitation and nutritional management as some specific strategies for a 'broad-based healthcare system'. We believe our trials suggest that the promotion of continuous rehabilitation, even after leaving a hospital, healthy meals, and the modification of the living environment, can contribute to disease prevention and functional recovery.

Also stated in this report, the study countries need to create further human resources to establish a 'broad-based healthcare system', at least in terms of chronic-phase rehabilitation and nutritional development, but digital technology, i.e. information technology, artificial intelligence, and robot technology, has the potential to bring the leapfrogging development of healthcare systems in these countries. Mobile data networks are expanding quickly globally and digital communications using smartphones is becoming widely available even in rural areas in all corners of the world. Digital technology can be a breakthrough for optimising healthcare resources which are unevenly distributed and usually concentrated in big cities in any country. In this sense, the component of digital technology could be included in the concept of a 'broad-based healthcare system'.

An example of a digital-technology-based approach is the case L2, which can be found in Chapter 2 of this report. Most family caregivers do not have the skills of caregiving. If a patient leaves hospital in the condition of full dependence, the family caregivers are required to provide intensive assistance to the patient, which would lead to a heavy burden, physically, mentally, and financially. If they can visit the hospital regularly, they could be given useful advice, but this is difficult for patients who live in the countryside. The case L2 would provide a good solution for such cases: video calls could make regular advice on rehabilitation and daily care possible even if the patient is based in a remote area. This system can be applied to other services like consultations and advice from experienced physicians and benefits both healthcare professionals and patients because it can reduce the cost and time for services.

Both the study countries and Japan have the same problem: an uneven distribution of healthcare resources and unmet needs for healthcare services, particularly in remote areas. All the governments can be encouraged to promote investment in the development of digital-technology-based healthcare services so that all people, from new-borns to older people, in any living condition can benefit from up-to-date healthcare services.

A cost-efficient healthcare system

As the population of older people grows, Japan's national medical care expenditure has been skyrocketing. It was about ¥30.1 trillion or 5.7% of the gross domestic product (GDP) of Japan in 2000 but increased to about ¥43.4 trillion or 7.9% of GDP in 2018. These figures do not include the expenditure of long-term care insurance, which was about ¥10.4 trillion in 2018. Considering the rapid population ageing, the study countries would also be expected to have a similar financial burden on healthcare services. The concept of a 'broad-based healthcare system' was designed to possibly contribute to the reduction of such a burden through the promotion of active, healthy, and productive ageing.

As the country with the most aged population in the world, Japan can share some good practices in line with a 'broad-based healthcare system'. Kashiwa City, located in the outskirts of Tokyo, provides one of them, the 'Kashiwa model'. The city has a large population of baby boomers, who were born some years after the end of World War II and still account for a considerable proportion in Japan's population structure. The Kashiwa model was designed to promote active and healthy ageing and to realise 'ageing in place' because it was expected that hospitals in and around the city would not be able to accommodate all the people of this generation when they were dying in terms of the capacity both of patient beds and human resources. The model incorporates a wide range of concepts, such as health promotion (disease prevention, community healthcare, nutritional improvement, and exercise programmes), social involvement of older people, seamless transition from acute care to long-term care, and information sharing systems amongst the stakeholders involved with any type of care in the community. The city also promoted the employment of older people as one of its strategies to prevent frailty.

Another example is the 'Life Support Mie-Nishi' project in Yokkaichi City, an industrial city in central Honshu of Japan. Under this project, older people in the local community established a membership group that provides mutual support amongst members for their daily needs, such as house cleaning, shopping, and food preparation, etc. Both these examples were developed aiming for the promotion of active, healthy, and productive lifestyles for older people and, potentially, for the reduction of financial costs of public healthcare expenditure.

In conclusion, this report dealt with the outcome of pioneering projects of chronic-phase rehabilitation and nutritional management in Cambodia, the Lao PDR, and Viet Nam. Considerable needs for such services have been detected, but it has also been identified that further resources are needed to provide such services. Considering the diversities in the social, culture, and political backgrounds of these countries, it would be important to deeply understand the real needs for the services, as presented in this project, to promote a 'broad-base healthcare system'. The governments of Cambodia, the Lao PDR, and Viet Nam can be encouraged to review their current healthcare systems, particularly whether they are covering the 'double burden' or not, and identify the unmet needs of healthcare services. Multilateral cooperation amongst Cambodia, Japan, the Lao PDR, and Viet Nam has a great potential for achieving the development of reliable and affordable healthcare systems which is in line with universal health coverage as mentioned in the 2030 Agenda

for Sustainable Development of the United Nations, through sharing practices and lessons from the different backgrounds with each other. Health for all without leaving anyone behind is indispensable for creating mutually beneficial relationships amongst the countries in the region and even for enhancing economic development.

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Appendix 1. Evaluation indicators

Indicator (abbreviation)	Indicator	Evaluation criteria and interpretation
BI ^a	Barthel index	<ul style="list-style-type: none"> • Evaluates the extent of daily activities the patient can perform in daily life • Ten items scored according to level of independence. Full score = 100 points • A score of 20 points or lower means the patient needs total assistance • Evaluation items: feeding, bathing, grooming, dressing, bowels, bladder, toilet use, transfer (bed to chair and back), mobility (on level surfaces) and stairs
mRS ^b	Modified Rankin Scale	<p>Method of evaluating functional independence in stroke patients</p> <p>Score descriptions</p> <p>0 – No symptoms.</p> <p>1 – No significant disability. Able to carry out all usual activities, despite some symptoms.</p> <p>2 – Slight disability. Able to look after own affairs without assistance, but unable to carry out all previous activities.</p> <p>3 – Moderate disability. Requires some help, but able to walk unassisted.</p> <p>4 – Moderately severe disability. Unable to attend to own bodily needs without assistance and unable to walk unassisted.</p> <p>5 – Severe disability. Requires constant nursing care and attention, bedridden, incontinent.</p> <p>6 – Dead.</p>
GCS ^c	Glasgow Coma Scale	<p>Evaluation indicator of consciousness level, which is evaluated using three functions: eye response, verbal response, and motor response. Severity and urgency are determined from the total score. Lower scores indicate lower consciousness levels.</p> <p>Eye response (E)</p> <ol style="list-style-type: none"> 1. No opening of the eye 2. Eye opening in response to pain stimulus

		<p>3. Eye opening to speech 4. Eyes opening spontaneously</p> <p>Verbal response (V)</p> <p>1. No verbal response 2. Incomprehensible sounds 3. Inappropriate words 4. Confused 5. Oriented</p> <p>Motor response (M)</p> <p>1. No motor response 2. Decerebrate posturing accentuated by pain 3. Decorticate posturing accentuated by pain 4. Withdrawal from pain 5. Localises to pain 6. Obeys commands</p>
BRS ^d	Brunnstrom's recovery stage	<p>Evaluation indicator for clinical motor function, which classifies recovery from hemiplegia due to stroke in six stages. The three evaluation sites are the arms, hands and fingers, and legs.</p> <p>The level of recovery in each stage:</p> <p>Stage 1 No voluntary movement of affected limbs. They feel heavy when moved passively and little or no muscular resistance can be detected.</p> <p>Stage 2 Basic limb synergies or some of their components appear either as weak associated reactions or a voluntary attempt to move. Spasticity is developing but may not be very marked.</p> <p>Stage 3 Basic limb synergies or some of their components are performed voluntarily and are sufficiently developed to show definite joint movements. Spasticity is present and, at one point or another, reaches its maximum.</p> <p>Stage 4 Spasticity decreases and an increasing number of movement combinations that deviate from basic limb synergies become possible.</p> <p>Stage 5</p>

		<p>Relative independence of basic limb synergies and waning spasticity. More difficult movement combinations can be performed, and individual joint movements are comparatively well under control. But the patient may have to concentrate intensely on some tasks.</p> <p>Stage 6</p> <p>Isolated joint movements are freely performed. In general, movements are well co-ordinated and appear normal or near normal. Spasticity almost disappears, although some interference resulting from spasticity may be noticed when rapid movements are required.</p>
MMSE ^e	Mini Mental State Examination	<p>Questionnaire-type test for dementia screening. Cognitive functions, including orientation, memory, and comprehension, are evaluated and scored using 11 questions.</p> <p>30–24 points: No impairment 23–18 points: Mild cognitive impairment 17–0 points: Severe cognitive impairment</p> <p>The above classification is one of the references. There are several previous studies for cut-off scores.</p> <p>We did not assess how the languages used in the three countries compared with our references edited in English.</p>
ROM ^f	Range of motion	<p>Measurement of the range of motion for each joint in the body.</p> <p>The normal range of motion specified for individual joints is used to evaluate the extent and cause of restriction.</p>

MMT ^g	Manual Muscle Testing	<p>Examination method that manually determines muscle strength in the primary muscles.</p> <p>Determination is made in six steps, depending on the strength of the muscle.</p> <p>Determination criteria:</p> <p>Normal. 5 = Max resistance</p> <p>Good. 4 = Mid resistance</p> <p>Fair. 3 = No resistance</p> <p>Poor. 2 = No resistance</p> <p>Trace. 1 = Palpable at muscle/tendon, no movement</p> <p>Zero. 0 = Nothing palpated</p>
Superficial sensation ^h	Superficial sensation test	<p>Evaluates the extent of impairment in tactile, pain, and temperature sensation in patients with hemiplegia due to stroke, in comparison with the non-paralysed side.</p> <p>The examination result is reported as normal, impaired (mild, moderate, severe), and disappeared.</p>
Deep sensation ⁱ	Deep sensation test	<p>Evaluates the extent of impairment in positional, motor, and vibration sensation in patients with hemiplegia due to stroke in comparison with the non-paralysed side.</p> <p>The examination result is reported as normal, impaired (mild, moderate, severe), or disappeared.</p>
10mWT ^j	10 Metre Walk Test	<p>Evaluation method to measure walking speed and number of steps over 10 metres (m).</p> <p>It is frequently used as an indicator to confirm therapeutic effect as it is related to the improvement of capability in daily activities.</p> <p>The ability to walk 10 m in 12.5 seconds or less indicates independence in walking outdoors.</p> <p>The ability to walk 10 m in 25 seconds or less indicates independence in walking indoors.</p>

Deep tendon reflex ^k	Deep tendon reflex	Evaluation used for motor and neurological diagnosis after a stroke . Depending on the level of reflex to the hitting of skeletal muscle with a plexor, the result is recorded as + for normal reflex and ++ for slightly increased reflex.
BBS ^L	Berg balance scale	The scale consists of 14 movements common in everyday life. Each item is evaluated from 0 to 4 points, and the maximum score is 56 points.

^a Matsuzawa (2001).

^b Matsuzawa (2001), The Joint Commission (2018).

^c Matsuzawa (2001), Royal College of Physicians and Surgeons of Glasgow (n.d.).

^d Matsuzawa (2001).

^e Matsuzawa (2001), Monroe and Carter (2012).

^f Matsuzawa (2001), American Physical Therapy Association (2019).

^g Matsuzawa (2001), Ciesla et al. (2011).

^h Matsuzawa (2001).

ⁱ Matsuzawa (2001).

^j Matsuzawa (2001), Palmer (2015).

^k Matsuzawa (2001), Walker (1990).

^L Berg K (1989)

Source: Authors.

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Appendix 2. Training of chronic-phase rehabilitation personnel in Japan

Under this project, three physical therapists, each from Cambodia, the Lao PDR, and Viet Nam, were provided the opportunity to undergo a rehabilitation training course hosted by Kitahara International Hospital and Kitahara Rehabilitation Hospital in Japan. This training programme (Table 2A) was carried out in 2019 to acquire the following knowledge and skills: 1) to modify the rehabilitation intervention in accordance with the recovery level of the patients in terms of risk management and the development of rehabilitation plans, and 2) to supervise the rehabilitation intervention at home, including learning how to use assistive and rehabilitation devices. They were also offered the chance to observe home-visit services in Japan and residential long-term care facilities, like nursing homes, in Japan. The programme included subjects on how to instruct home rehabilitation to family members and rehabilitation practices with the goal of returning to work.

Table 2A. Training programme

Time	Details
Week 1	Facility tour and understanding of the healthcare system in Japan
Week 2	Understanding of the hospital vision and mission, particularly related to care for chronic-phase patients
Week 3	Clinical training ^a 1: Multi-professional collaboration in rehabilitation practice in accordance with the condition of the patients Acquiring knowledge of the medical care system, insurance, and services
Week 4	Clinical training 2: Rehabilitation practice for chronic-phase patients in accordance with the condition of the patients.
Week 5	Clinical training 3: Development and implementation of rehabilitation plan and self-evaluation

^a Clinical training was conducted in the format of a clinical clerkship. A clinical clerkship is a method of clinical training. The trainees are required to participate in actual services under the supervision of healthcare practitioners aiming to acquire more practical clinical skills.

Goals of the training

The following items were used for the assessment of the effect of the training. Paper-based tests equivalent to the level of the national qualification exam for Japanese physical therapists were also administered before and after the training for the same purpose.

I. Chronic-phase rehabilitation

- (i) Care for patients still staying in hospital in accordance with the recovery level
 - Risk management
 - Understanding of the vital signs and physical observations of recovery-stage patients and providing risk management accordingly
 - Understanding of the medical history and sequelae of recovery-stage patients and providing risk management accordingly
 - Understanding of the disorder and related complications
 - Evaluation of physical and cognitive functions
 - Cognitive function
 - Body functions
 - Capability assessment (including ADL and balance)
 - Development of a treatment plan
 - Cognitive function
 - Body functions
 - ADL
 - Treatment
 - Cognitive function
 - Body functions
 - ADL
 - Prediction of prognosis and goal setting
 - Cognitive function
 - Body functions
 - ADL
- (ii) Home care after discharge
 - Assistive devices
 - Understanding the types available on the market
 - Understanding the method of use
 - Long-term care services
 - Understanding the types available
 - Understanding the long-term care insurance system
 - Family guidance
 - Method of care

- Method of rehabilitation
- Modification of living environment
- Medication and signs requiring medical treatment (medical management)
- QOL
- Employment support
- Hobbies
- II. Behaviour of trainees
- Social behaviour
- Greetings
- Communication skills, including facial expression and speaking tone
- Never losing things
- Punctuality
- Appropriate dressing and grooming
- Keeping cleanliness
- Maintaining tidiness
- Self-health management
- Daily schedule control
- Schedule control several days ahead
- Work attitude
- Emotional stability
- Concentration
- Proactive attitude
- Cooperative attitude
- Flexibility
- Work capability
- Timely reporting and consultation with appropriate personnel
- Understanding instructions
- Understanding own tasks
- Understanding how to solve problems
- Problem-solving skills

Record of training

i. Trainee from Viet Duc University Hospital in Viet Nam

The trainee was a 24-year-old female staff. The goals of her training were: 1) acquiring enough knowledge to promote rehabilitation services in Viet Nam, 2) understanding the whole process of chronic-phase rehabilitation, from the assessment of the client's status to the planning and practice of the treatment, and 3) understanding the seamless transition from acute-phase care to home care and returning to the community. During the training, she participated in regular conferences in the hospital, joined the home-visit rehabilitation team, and visited nursing homes. She also observed the activities of STs and OTs.

The following is the report of the trainee.

I could feel a difference in the medical care environments between Japan and Viet Nam. In the daily operations in Japan, not only communication within the department of rehabilitation but also communication irrespective of occupation, such as between physicians and nurses, is carried out. I think this builds a strong bond as a team centred on the patient, so more efficient and effective treatment and rehabilitation can be carried out towards discharge. I could visit not only PTs but also OTs and STs, and I could deepen my understanding of the patients from various standpoints. I could accompany home-visit rehabilitation from acute phase to after discharge, and visited long-term care health facilities, etc. I could realise the importance of considering the entire life of the patient, instead of just looking at one part of their life. I want to utilise this viewpoint even after I return to Viet Nam.

She showed eagerness to acquire knowledge and skills as much as possible during the training. She proactively and voluntarily tried to communicate with the patients and staff, and asked questions on whatever was unclear so that she could understand completely.

She was interested in not only rehabilitation but also the healthcare system and team medicine. The training focused on chronic-phase rehabilitation, but the support for those with dementia was also taken as a topic of the training. The trainee was provided with many opportunities to observe the lives of the patients after leaving hospital so that she could promote the seamless transition from acute-phase care to home care after returning to her home country.

ii. Trainee from Mittaphab Hospital in Lao PDR

The trainee was a 23-year-old female staff. The training was provided with the following goals: 1) understanding the whole process of chronic-phase rehabilitation, from the assessment of the client's status to the planning and practice of the treatment, and 2) understanding the seamless transition from acute-phase care to home care and returning to the community.

The following is the report of the trainee.

One difference between the Lao PDR and Japan is the use of medical and nursing care insurance. Japan has many services and a perfect medical team for which the patient is compensated by insurance. I felt Japan's nursing care insurance is thorough, and patients can use the service even after discharge and for assistive devices. When I return to the Lao PDR, I want to share chronic-phase rehabilitation and support after discharge to the staff and family of the patients and want to utilise the support power of the family, which is an advantage in the Lao PDR.

Despite her limited English skills, the results of the test that was administered before and after the training showed that she successfully deepened her understanding of the flow from admission to discharge as well as multi-professional cooperation for achieving a seamless transition from acute-phase care to home care.

After returning to her home country, she proactively shares what she learned during this training with colleagues, including physicians and nurses, particularly on team medicine. At the sessions with the patients and their family members before leaving hospital, she provides information about assistive devices and the rehabilitation resources available in the Lao PDR and encourages them to modify the living environment of the patients, including house renovation to realise effective chronic-phase rehabilitation and a seamless transition. She created a caregiving manual that can be used for guidance for families to share the recommended home-rehabilitation methods after leaving hospital.

iii. Trainee from Sunrise Japan Hospital Phnom Penh in Cambodia

The trainee was a 30-year-old male staff. The training was provided with the following objectives: 1) learning how to develop chronic-phase rehabilitation programmes, 2) learning multi-professional collaboration in chronic-phase rehabilitation, and 3) learning the methods of home training, family guidance before hospital discharge, and support after discharge in chronic-phase rehabilitation.

The following is the report from the trainee.

In Japan, I could learn how to plan a rehabilitation programme until discharge from Kitahara Rehabilitation Hospital and the adjustment method of services after discharge. The hospital had a place for information sharing, not only between rehabilitation occupations but also for all related occupations. I realised that actually having visiting rehabilitation at the patient's house was important for a better, earlier, and safer hospital discharge.

In Cambodia, due to traffic conditions and staff shortages, it is difficult to frequently visit a patient's house, carry out home rehabilitation, and consider the home environment. However, I think that ways to carry out rehabilitation in consideration of the patient's life after hospital discharge need to be designed, even if we cannot visit the house.

The trainee had 7 years of clinical experience as a physical therapist, but his willing attitude to learn from even young members of the Japanese staff was noteworthy. He developed a clear goal of this training by himself, which was to understand how to make plans for a rehabilitation programme until discharge and how to adjust the available

services after discharge to optimise the patients' functions. Indeed, he often asked questions to supervisors and even offered suggestions.

By accompanying hospital staff to visit the homes of the patients who were provided with home rehabilitation and attending conferences to discuss such cases, he seemed to realise the importance of seamless services from the acute phase to home care, taking the expected lives of patients after leaving hospital into consideration.

After returning to Cambodia, he practices what he learned during this training. He routinely asks the family members about the living environment of patients and provides suggestions to them to modify it if it is necessary for the patients to return home safely and to continue chronic-phase rehabilitation. He thinks that more opportunities for physicians, patients, and family members come together to discuss the goals of the patient should be created and more training outdoors during rehabilitation time is required to promote the successful reintegration of the patients into the communities.

Appendix 3. Staff education and outreach activities

Cambodia

Since the establishment of the Sunrise Japan Hospital Phnom Penh in October 2016, the department of rehabilitation of the hospital has been working for the capacity building of local staff and outreach activities to local professionals and the communities, aiming for promoting seamless care from the emergency stage to rehabilitation at the hospital followed by at home through the provision of tailor-made services in accordance with the condition of individual patients. The department provides lectures to the hospital staff of other professions, as well as the public and companies. Local staff are assigned as the speakers of lectures as much as possible, but due to the lack of local experts on swallowing, speech, and hearing fields, Japanese SLPs provide lectures to the Cambodian staff remotely on such topics. The lectures held within the hospital are shown in Table 3A.

As outreach activities, the department of rehabilitation of the hospital delivered a lecture at the Asian Pacific Society of Hospital General Medicine conference in August 2019, which was attended by about 200 Cambodian physicians, nurses, pharmacists, laboratory technicians, physical therapists, and medical students, etc. In March 2019, the department presented a lecture on the prevention of back, neck, and shoulder pain due to office work to office workers. The department also provided medical support at two marathon events which took place in 2019 in Cambodia. The department is ready to expand its outreach activities, particularly the cooperation with the Cambodia Physical Therapy Association, considering the scarce opportunities for expert lectures in Cambodia.

Table 3A. Lectures in Cambodia

Workshops at Sunrise Japan Hospital Phnom Penh (SJH)			
Date	Title	Target participants	Number of participants
2018			
10 Oct	Remote lecture from Japan (swallowing rehabilitation)	SJH staff	8
14 Nov	Workshop within the department (stroke)	SJH staff	7
26 Dec	Workshop within the department (motor paralysis)	SJH staff	7
2019			
18 Jan	Remote lecture from Japan (testing method for severe swallowing disorder)	SJH staff	8
5 Apr	Lecture class in the department of nursing (assistance techniques)	SJH staff (nurses)	15
6 Mar	Workshop within the department	SJH staff	8

	(swallowing rehabilitation)		
20 Mar	Workshop within the department of nursing (swallowing rehabilitation)	SJH staff (nurses)	10
24 May	Workshop within the hospital (wheelchair)	SJH staff	40
2 Sep	Japan training briefing	SJH staff	6
3 Sep	Workshop within the department (swallowing rehabilitation)	SJH staff	7
5 Sep	Workshop within the department (daily life activities)	SJH staff	7
7 Sep	Remote lecture from Japan (higher brain dysfunction)	SJH staff	7

Source: Authors.

Lao PDR

Since the launch of the Kitahara project at Mittaphab Hospital in Lao PDR in January 2018, we have been working for the capacity development of the local staff and the improvement of the awareness of patients and family members, focusing on the following topics: 1) seamless rehabilitation services from the acute phase to home life, 2) skill transfer to the medical staff, 3) raising awareness of rehabilitation and caregiving amongst the public, particularly the family members of patients, 4) early detection of strokes and dissemination of prevention methods. Workshops were held as shown in the Table 3B as well as on-the-job training. Table 3C is the record of public lecture series. This lecture series was presented aiming for the introduction of Kitahara Group in the Lao PDR. Participants were recruited mainly from those who visited the cardiovascular ward of Mittaphab Hospital. We also delivered lectures to the students of the PT training course of the University of Health Sciences with the title of ‘rehabilitation and clinical reasoning’ in January and July 2019.

Table 3B. Workshops held at Mittaphab Hospital

Workshops at Mittaphab hospital			
Date	Title	Target participants	Number of participants
2018			
7 Sept	How to view brain imaging	Mittaphab hospital PT	3
26 Nov	Bell’s palsy	Mittaphab hospital PT	3
11 Nov	Aphasia	Mittaphab hospital PT	3
29 Nov	Stroke rehabilitation and case study	Mittaphab hospital PT	20

26 Dec	Swallowing disorder	Mittaphab hospital PT and PT students	25
27 Dec	How to view brain imaging	Mittaphab hospital PT and PT students	3
2019			
21 Feb	Stroke case study	Mittaphab hospital PT and PT students	3
26 Mar	Stroke case study	Mittaphab hospital PT and PT students	3
27 Mar	How to view brain imaging	Mittaphab hospital PT	3
24 July	Risk management in the acute phase	Mittaphab hospital PT	3

Source: Authors.

Table 3C. Public lecture series in the Lao PDR

Public lecture series		
Date	Title	Number of participants
2018		
24 Aug	1) What is stroke rehabilitation?	30
27 Sept	2) What is stroke rehabilitation?	12
31 Oct	3) Introducing rehabilitation that can be performed at home	15
4 Nov	[World Stroke Day Event] What is stroke rehabilitation?	50
21 Nov	4) Introducing rehabilitation that can be performed at home	10
21 Dec	5) Introducing rehabilitation that can be performed at home	25
2019		
23 Jan	6) Prevention of stroke. Introducing rehabilitation that can be performed at home	35
20 Feb	7) Prevention of stroke. Introducing rehabilitation that can be performed at home	25
22 Mar	8) Prevention of stroke. Introducing rehabilitation that can be performed at home	20

Source: Authors.

Viet Nam

Since the Kitahara Group commenced the collaborative project with Viet Duc University Hospital in August 2017, we have continued to share our experience and skills of rehabilitation for patients with brain and/or nerve damage with physicians, nurses, and rehabilitation staff in Viet Nam.

For the rehabilitation staff, lectures as well as on-the-job training dealt with brain function anatomy, rehabilitation theory based on the plasticity of the brain and nerves, and the rehabilitation-related evaluation and treatment of patients with brain damage.

For nurses, our instructions focused on caring for patients to achieve independent daily lives and on the importance of getting out of bed as early as possible after the onset.

Table 3D shows the list of workshops held in Viet Duc University Hospital during this project period.

We also organised training sessions in Hai Duong Province and Bac Giang Province when we visited rehabilitation hospitals there in 2019. With the cooperation of the inpatients at the visited rehabilitation hospitals, practical training sessions could be held as well as lectures so that the participants, who were local rehabilitation staff and other staff involved with rehabilitation and patient care, could understand the importance of rehabilitation and support for the daily lives of the patients with brain damage. During the training, we focused on the importance of exercise therapy rather than electrical or heat therapy, which are still commonly practiced as rehabilitation services in Viet Nam but less effective than exercise therapy.

In addition, we partnered with the Viet Nam Nursing Association and Neurosurgical Society and were provided with the opportunities to deliver lectures and exchange knowledge and techniques on rehabilitation and care for patients with brain damage. Specifically, we attended the fourth annual meeting of the Viet Nam North Neurosurgical Society in September 2018, a conference of the Viet Nam Nursing Association in October 2018, a conference of the Viet Nam Colostomy Care Association in November 2018, the fifth annual meeting of the Viet Nam North Neurosurgical Society in June 2019, and the third annual meeting of Surgery and Nursing Viet Nam in August 2019. We were also given a chance to share our experiences of rehabilitation with the officials of the Ministry of Health and the Ministry of Labour, Invalids and Social Affairs in August 2018. Other outreach activities were a session at General Agriculture Hospital, which was organised by Nursing Association in November 2018 and attended by nurses of that hospital and nearby, and a session at Thien Duc Elderly Care Centre organised by the Gerontological Society in June 2019.

Table 3D. Lectures at Viet Duc University Hospital

Workshops at Viet Duc University hospital			
Date	Title	Target participants	Number of participants
2018			
6 Aug	Introduction to the Kitahara Group. Mechanism of swallowing	Nurses at Viet Duc University Hospital	23
21 Aug	Swallowing evaluation 1)	Nurses at Viet Duc University Hospital	20
25 Sep	Swallowing evaluation 2) VF and Introduction of VF	Nurses at Viet Duc University Hospital	18
27 Nov	Ice massage, oral swallowing exercise methods	Nurses at Viet Duc University Hospital	20
2019			
10 Jul	Swallowing evaluation 3)	Nurses at Viet Duc University Hospital	20
18–21 Jul	Rehabilitation workshop	Participants of Rehabilitation workshop of VDUH, Austrian Vietnamese Advancement Neurorehabilitation Treatment	50

Source: Authors.

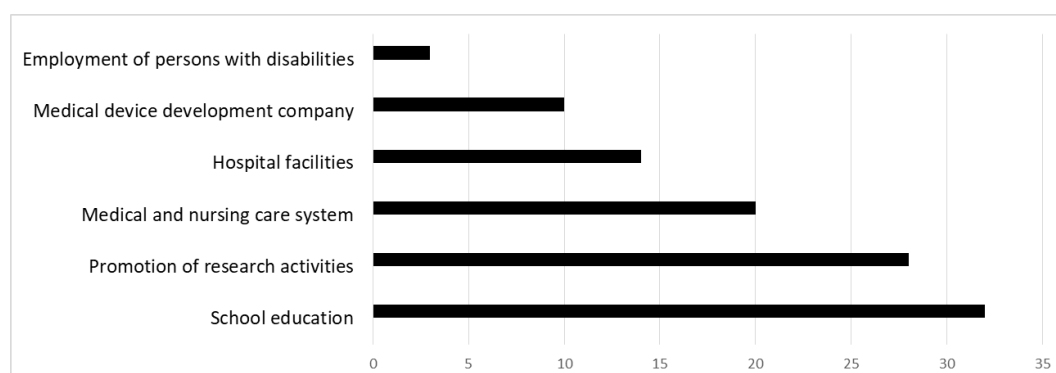
Appendix 4. Stroke Care Conference in the Lao PDR 2019

Stroke Care Conference in the Lao PDR 2019 - Multi-disciplinary Challenge and Cross-border Communication was held on 6 and 7 July 2019. This event was co-organised by the Kitahara Group and Mittaphab Hospital. The conference was attended by 353 persons, mainly Lao PDR physicians, nurses, physical therapists, but including the invitees from Cambodia, Viet Nam, and Japan. Besides ordinary oral and poster sessions, the conference had two invited lectures, three keynote lectures, and two hands-on seminars. The speakers of these special sessions were all Japanese staff of Kitahara Group except one doctor from a Japanese university. Both the oral and poster sessions had 10 papers each. As we promote multi-disciplinary cooperation to establish a stroke-care system in these three countries, this conference accepted the papers developed by any professions related to stroke care – physicians, nurses, and rehabilitation staff, etc. and such multi-disciplinary discussions were encouraged at the conference.

According to the results of a questionnaire survey targeting the participants of this conference, most of them were satisfied with the contents of the conference, particularly being provided with an opportunity to learn the stroke care of other countries.

To the question about the most required action to improve medical services in the region, the item ‘improvement of school education’ was selected by most respondents, followed by the ‘promotion of research activities’ (Figure 3A).

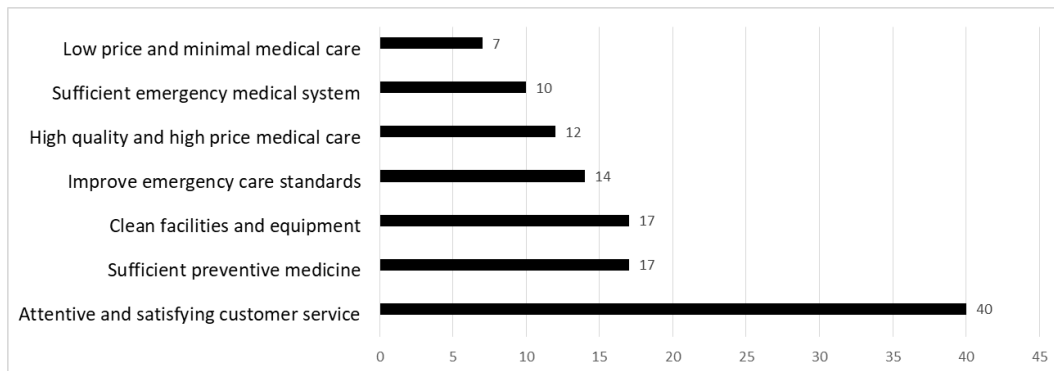
Figure 3A. What is necessary for medical development in the region in the future?
[N=83, Multiple answers were allowed.]



Source: Authors.

To the question ‘what are the most necessary elements for medical care?’, the answer selected most commonly was ‘attentive and satisfying customer service’, followed by ‘clean facilities and equipment’ (17 persons), and ‘sufficient preventive medicine’ (Figure 3B). The following comment was also found: the reason why the patients do not want to come to the hospital is the unfriendliness of hospital staff.

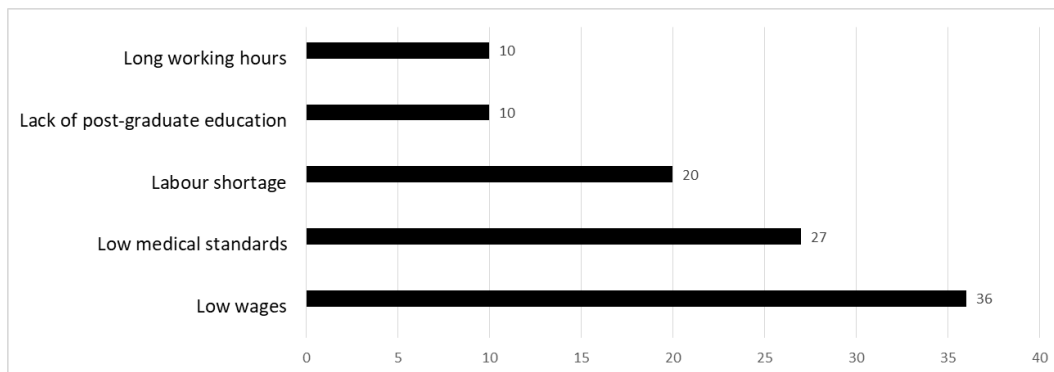
Figure 3B. What are the necessary elements for medical care?
[N=83, Multiple answers were allowed]



Source: Authors.

To the question about the biggest problems for healthcare professionals, most respondents selected the answer of 'low wages', followed by 'low medical standards' and 'labour shortage' (Figure 3C). The respondents also pointed out, as open comments, the poor knowledge and skills of medical personnel, poor coordination between acute care and chronic care, which can be the cause of unsatisfactory treatment outcome, and the poor quality of undergraduate education.

Figure 3C. What are the biggest problems for healthcare professionals in your area?
[N=83, Multiple answers were allowed]



Source: Authors.