Special Article

Physical Therapy Workforce Shortage for Aging and Aged Societies in Thailand

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According to demographic changes, the size of the aging population has rapidly increased. Thailand has been facing the "aging society" since 2005 and the "aged society" has been projected to appear by the year 2025. Increased life expectancy is associated with health problems and risks, specifically chronic diseases and disability. Aging and aged societies and related specific conditions as stroke require the provision of services from health professionals. The shortage of the physical therapy workforce in Thailand has been reported. This study investigated the size of physical therapy workforce required for the approaching aging society of Thailand and estimated the number of needed physical therapists, specifically regarding stroke condition. Evidently, the issue of the physical therapy workforce to serve aging and aged societies in Thailand requires advocating and careful arranging.

Keywords: *Aging society, Aged society, Physical therapy workforce*

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Approaching the aging society, Thailand is experiencing the rapid growth of the elderly population. The advances in medical technology and family planning policies have resulted in increased longevity, decreased mortality and declined fertility[1-4]. These changes have impacted the population demography and led Thailand into the aging society since the year 2005[1-3], with 10.3% of the population aged 60 and over. Moreover, the population aged 60 and over is expected to reach 20% indicating an "aged society" in the year 2025[3,5,6]. The increased life expectancy is associated with health problems and risks, especially physical disability and chronic diseases[7]. Four of five elderly people aged over 65 years reportedly have at least one noncommunicable disease caused by dietary habits, lifestyle or other inappropriate health behaviors[5,7].

The population burden of a disease, stated as Disability-Adjust Life Years (DALYs), quantifies not only the mortality but also the disability experienced throughout life caused by a disease[8]. According to the report on the Aging Health in Thailand 2009-2012[9], the greatest burden of disease was stroke with DALYs as high as 12.4% for females and 11.4% for males[9,10]. The prevalence of stroke among Thai adults aged 60 and over was reported to be 3% for females and 4% for males, in the years 2008-2009[9].

The physical therapist (PT) plays a vital role to improve functions and quality of life of individuals with stroke throughout the disease course[11]. For individuals with stroke after the hospitalized period, PT provides home healthcare to train patients and caregivers in the essential therapeutic exercises, ambulation techniques, daily activities as well as other personal cares[12].

According to the Planned Health Workforce in the year 2012-2017 by the Thai Ministry of Public Health (MOPH), at least one PT is needed for 10,000 people in Thailand. However, 4,543 PTs were estimated to be employed in the Thai health care system by the year 2017. Among these, only 1,995 PTs would work in the public health services sector, resulting in a shortage of 2,548 PTs[13]. However, the rough estimation of PT per population tends to be underestimated considering the actual needs of services particularly among the aging population. The purposes of this review were therefore to demonstrate the PT workforce required for the approaching aging society of Thailand and to estimate the number of PT needed specifically for stroke condition.

Physical therapy workforce in Thailand

To estimate the PT workforce requirements, the workforce population ratio and health need

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approaches were used to calculate numbers based on the guidelines recommended by the World Health Organization (WHO)[14,15] and Basur and Gandhi[16].

The projections of the physical therapy workforce in Thailand

The data sets used in the present study were selected from the national agencies of Thailand. The population and physical therapy professional data were recruited for analysis. The projections of total population and the size of the aging population were gathered from two data sources, i.e., the Population Projections for Thailand 2000-2025[3] and the report on the 2007 Survey of the Older Persons in Thailand[2].

The number of PT employed was collected from the reports of the Estimated PT workforce in the Next 10 Years (2009-2020) by the Physical Therapy Association of Thailand and the Physical Therapy Council, Thailand[12]. The estimations of demand and supply of the PT workforce were determined according to the assumptions described below. The number of students dropping out was estimated at 7%[12]. The graduate loss rate was 5%[12]. The number of graduates that could pass the licensing exam rate was 66%[12]. The licensed PT loss rate was 46.9%[12]. The cumulative licensed PT profession in 2010 was estimated at 5,504 PTs[11]. At least 15 PT visits for individuals with stroke from 1-6 months and 6 PT visits for people over 6 months post-hospitalization are required[12]. The time spent for one visit should total 1.4 hours[12]. The PT work hours yearly should total 1,119.5 hours[12]. The ratio of PT to total population is estimated at 1:10,000[13]. The stroke data was based on the report of the Health of Aging in Thailand 2009-2012[9]. The prevalence of stroke at the age of 60 years and over was 4% for males and 3% for females[9].

The operational definitions of terms used in the calculation of the present study are described below. Number of PT student graduates = number of PT students that the university planned to enroll in each academic year – number of student drop outs[12].

Number of licensed PT in health system = [(number of PT student graduates - graduate loss rate) x (graduates who passed the license exam rate) + (cumulative licensed PT professionals)] - licensed PT loss rate[12,14].

Cumulative licensed PT = [(number of graduates in each year – (graduates x graduate loss rate)) x number of graduates passing the license exam rate] + accumulated licensed PT professionals (the year before)[12,14].

Number of people in the aging population with stroke condition = (number of males in the aging population (each year) x prevalence of stroke) + (number of females in the aging population (each year) x prevalence of stroke)[15].

Size of the PT workforce needed for total population = total population (each year)/10,000[13].

Size of PT workforce needed for aging population with stroke condition was modified from

$$M = \frac{P \times I \times N \times T}{S}$$

Where M = the workforce requirement in a given year; P = the projected aging population at risk or the projected population to receive a specific service; I = the average number of expected incidents of stroke per person per year; N = the average number of a given kind of service to be provided per incident per year per population unit; T = the average time a service takes; and S = the total amount of time a practitioner works during one year for direct health services[15].

Size of the PT workforce needed for aging population with stroke condition, after being hospitalized from one to six months = (size of the aging population with stroke condition x number of services that PT can provide (stroke, after being hospitalized from one to six months) x time spent per service)/PT work hours.

Size of PT workforce needed for aging population with stroke condition, after being hospitalized after six months = (number of aging population with stroke condition x number of services that PT can provide for aging population (stroke, post-hospitalized after six months) x time spent per service)/PT work hours.

Table 1 presents the yearly projected numbers of PT graduates and cumulative licensed PT, as well as the aging population and those with stroke condition. The projections of PT workforce for different scenarios are shown in Table 2. Roughly estimating the need of one PT per 10,000 populations, the number of PT would be sufficient for total population by the year 2023. However, the size of the PT workforce would still be less than required for the aging population with stroke especially considering the ultimate physical therapy services for stroke condition.

From these projections, Thailand would still face a PT workforce shortage for total population until 2022. However, with the assumption of the 1:10,000 ratio proposed by the MOPH, the service capacity of

Table 1. The projections of PT graduates, cumulative licensed PT and the aging population with stroke condition

Year	Number of graduates	Cumulative licensed PT	Population aged ≥60* (in thousands)		Aging population with stroke condition (in thousands)
			Male	Female	
2009	781		3,332	4,253	250#
2010	809	5,504 [a]	3,467	4,375	270
2011	958	6,105	3,572	4,531	279
2012	1,014	6,740	3,697	4,707	289
2013	1,014	7,376	3,843	4,907	301
2014	1,023	8,017	4,006	5,127	314
2015	1,070	8,688	4,191	5,368	329
2016	1,070	9,358	4,354	5,598	342
2017	1,060	10,023	4,538	5,850	357
2018	1,042	10,676	4,740	6,120	373
2019	1,042	11,329	4,956	6,406	390
2020	1,042	11,982	5,184	6,704	408
2021	1,042	12,635	5,385	6,983	425
2022	1,042	13,289	5,596	7,270	442
2023	1,042	13,942	5,815	7,566	460
2024	1,042	14,595	6,041	7,868	478
2025	1,042	15,248	6,273	8,179	496

[a] The Physical Therapy Council 2009

* Population projections for Thailand 2000-2025 (medium fertility assumption) National Economic and Social Development Board[3]

The estimated population aged 60 and over (7.3 million) in 2009[9]

the physical therapy field would be questionable. The optimal number of PT relative to a population has not been established but generally is greater than 1:10,000 in developed countries as well as countries with an aging society[17]. The health needs for PT is apparently increasing when a country enters the aging society, and the ratio would be definitely higher than the proposed number[11].

However, if the authors assume the maximum need for aging people with stroke in acute and subacute states (after being hospitalized one to six months), the size of the PT workforce would be insufficient. Since the first six months after stroke is the golden period providing the best chance to recover, to improve the quality of life and achieve the least disability[18-21], the proposed maximum need of PT services is obligatory. Also, the size or percentage of the PT workforce to specifically serve the aging population with stroke was not determined in the present study because the information was insufficient for such estimation. This specific service issues need to consider both quantity and quality aspects.

Two important patrons, i.e., the academic and the service institutions, take part to allocate the number of PT in Thailand. Working together, these counter parts can mandate the national health policy to advocate the universities to regulate production according to health workforce planning. The university and professional organizations also need to manage the issues of students dropping out, numbers of graduates lost, and the number of registered professional and licensed PT lost from the health system that also highly affect the PT workforce[12].

The other issue is the employment of PT in public health services. Although, the number of PT in community and district hospitals in Thailand has been increasing recently, the PT positions at all levels of government hospitals are still required[13]. Also, the salary and benefit package would trigger the migration of PT workforce from the public to the private health sector especially in the future after the ASEAN economic community (AEC) is fully functioning. The free movement of skilful labor might directly impact the PT workforce of Thailand.

Limitations of this study

The present study showed only the PT point of view, i.e., the overall health system was not covered.

Table 2. The projections of the PT workforce

Year	PT workforce			
	Needed for total population*	Needed for aging population with stroke, after being hospitalized		Estimated in health system
		From 1-6 months	After 6 months	
2009	6,660	4,690	1,876	2,839**
2010	6,704	5,063	2,025	2,923
2011	6,740	5,230	2,092	3,242
2012	6,779	5,423	2,169	3,579
2013	6,819	5,645	2,258	3,917
2014	6,862	5,891	2,356	4,257
2015	6,906	6,166	2,466	4,613
2016	6,940	6,417	2,567	4,969
2017	6,974	6,697	2,679	5,322
2018	7,010	7,001	2,800	5,669
2019	7,046	7,324	2,929	6,016
2020	7,082	7,662	3,065	6,363
2021	7,111	7,970	3,188	6,709
2022	7,140	8,290	3,316	7,056
2023	7,170	8,621	3,448	7,403
2024	7,199	8,961	3,584	7,750
2025	7,229	9,310	3,724	8,097

* Number of PT needed for total population with PT: Population ratio of 1:10,000
** The physical therapy survey in June 2009[11]

Furthermore, the present study specifically considered only stroke condition, which causes the highest burden of disease for the aging population in Thailand. In addition, the risk factors of stroke including hypertension, diabetes mellitus and heart disease were not considered. Moreover, adjusting the ratios in the case of increasing or decreasing trends in any particular issues was not added in the calculation.

Further studies are warranted to investigate health needs and demands of the aging population regarding various health needs and scenarios. In addition, the different roles of PT, i.e., the tasks of disease prevention, health promotion, major condition treatment and restoration should be considered.

The recent regulations of renewed licensing with continuing education, announced by the PT Council in 2013, might change the situation of number of cumulatively licensed PT. The data of licensed PT loss would be more accurate over the next few years and the PT workforce situation should be re- evaluated.

Conclusion

The size of the PT workforce for serving the aging society is still insufficient for both total population and aging population with stroke. This issue requires careful advocating and planning.

What is already known on this topic?

The increased life expectancy and its rising trends create health problems and risks, particularly regarding chronic disease and disability. These issues require health services to improve the quality of life. A shortage in the PT workforce has been reported in Thailand.

What this study adds?

This review confirmed previous studies that the PT workforce in Thailand is inadequate. It demonstrates the projections of the PT workforce in Thailand from present to the year 2025, and projects the scenarios for the PT workforce needed for the total population, and needed for the aging population with stroke (after being hospitalized), and across the health system.

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Potential conflicts of interest

None.

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การขาดแคลนกำลังคนนักกายภาพบำบัดสำหรับสังคมผู้สูงอายุในประเทศไทย

รัชนก ไกรวงศ์, มัณฑนา วงศ์ศิรินวรัตน์, กุศล สุนทรธาดา

การเปลี่ยนแปลงประชากรผู้สูงอายุที่เพิ่มขึ้นอย่างรวดเร็วส่งผลให้ประเทศไทยเข้าสู่สังคมผู้สูงอายุตั้งแต่ปี พ.ศ. 2548 และคาดการณ์ว่าจะเข้าสู่สังคมผู้สูงอายุโดยสมบูรณ์ในปี พ.ศ. 2568 อายุขัยเฉลี่ยที่เพิ่มขึ้นสัมพันธ์กับปัญหาสุขภาพและความเสี่ยงของโรคเรื้อรังและความพิการ สังคมผู้สูงอายุและภาวะเฉพาะ เช่น โรคหลอดเลือดสมองจำเป็นจะต้องได้รับบริการจากบุคลากรด้านสุขภาพ มีรายงานสถานการณ์ปัญหาการขาดแคลนกำลังคนนักกายภาพบำบัดในประเทศไทย การศึกษานี้แสดงจำนวนกำลังคนนักกายภาพบำบัดที่ขาดแคลนสำหรับการเข้าสู่สังคมผู้สูงอายุในประเทศไทย และประเมินจำนวนนักกายภาพบำบัดที่จำเป็นต้องมีโดยเฉพาะสำหรับผู้ที่เป็นโรคหลอดเลือดสมอง ประเด็นกำลังคนด้านกายภาพบำบัดที่จะให้บริการสำหรับสังคมผู้สูงอายุและสังคมผู้สูงอายุโดยสมบูรณ์ในประเทศไทยจะต้องได้รับการจัดสรรและบริหารจัดการอย่างเอาใจใส่