Exploring the home services utilization and its influencing factors for case closures in Taiwan long-term care system

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Objectives: In order to develop person-centered service delivery in the community, it is important to understand the causal relationships among older adults' personal factors, service utilizations, and the ability to reside in the community from a longitudinal perspective. This study aimed to examine the profile of home services utilization and the reasons for case closures in two years, as well as the related influencing factors, among home service recipients in southern Taiwan. **Methods:** We analyzed the long-term care dataset of one southern metropolitan area from 2011-2015, and the records of 9,889 persons aged 50 and over who received home services with an initial need assessment (T0). The Cox Regression Analyses were used to examine the potential risk factors for leaving the services. **Results:** The high rates of case closures included death (20%) and drop-out (41%), mainly due to the need to search for caregiving resources within family networks. In terms of the influencing factors for leaving the services, those who with non-low household incomes, informal caregiving burden and moderate cognitive impairments were more likely to drop out. **Conclusions:** This study provides empirical evidence of the high dropout rate and the importance of further investigations to explore the service gap in this context, especially the need to give more attention to those service users who then drop out of the system. (*Taiwan J Public Health*. 2018;**37(5)**:539-553)

Key Words: home services, utilization, case closure, unmet need, long-term care

INTRODUCTIONS

Population Aging and the Need for Long-Term Care

By the end of 2017, Taiwan had nearly 3.2 million people aged 65 and over, accounting for approximately 13.9% of the total population. This number is expected to rise to 20% of the population by 2025 and 42% in 2062 [1]. As such, Taiwan has the fastest aging population in Asia and thus faces an increased prevalence of age-related chronic diseases, functional disabilities and long-term care (LTC) needs.

Long-term care refers to a wide range of health and health-related support services provided on an informal or formal basis to people who have functional disabilities over an extended period of time, with the goal of maximizing their independence [2]. According to the health-adjusted life expectancy (HALE) metric, which adjusts overall life expectancy

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according to the number of years lived with poor health, on average, Taiwanese people experience eight years of unhealthy life [3]. In terms of disability rate, about 3.36% of the total population aged five years and over in Taiwan have LTC needs, and this number rises to 16.5% among those aged 65 and over [4]. According to the statistics [4, 5], there were approximately 557,460 persons with functional disabilities in 2017 and among them, it was more than 416,470 persons aged 65 and over (75%). Moreover, the number of disabled people in Taiwan is expected to 1,210,000 by 2031 [4]. However, according to the statistics for the dependency ratio, there were approximately 5.2 people in the prime of their working lives to support one person aged 65 and over in 2017, and this number will have fallen to 1.3 people to support one elderly person by 2060 in Taiwan [6]. That means that fewer young people will be around to meet the elderly's long-term care needs in the future.

The Long-Term Care Policies and the Home Service Delivery in Taiwan

The Taiwanese government launched the LTC 1.0 policy in 2007, aimed at helping frail elderly people with LTC needs, including elderly people aged 65 and over, people aged 50 and over with a disability certificate, and aboriginals aged 55 and over [6]. This LTC 1.0 policy aimed at developing the home and community-based services (HCBS), such as home services, adult day care, home nursing care, home and community-based rehabilitation, home meal delivery, respite care for caregivers and transportation services. As mentioned in previous literature, HCBS are designed to offer forms of support that allow older adults to age within their communities [4, 7] and the main health services that are used primarily based on the choice of the individual care recipient are

homemaker or personal care services (PCS) [4, 8].

In the past ten years, from 2007-2016, the LTC policy and service network in Taiwan has set up the eligibility criteria for people who can get HCBS (formal services) in the long-term care system [1]. In HCBS, the home services delivery that certified nursing assistants (CNAs) provide for long-term care recipients, such as services related to personal care and home-related errands, have been the most commonly used services since the launch of the LTC 1.0 policy in 2007. Based on each household's social welfare status, the LTC recipients need to co-pay 30%, 10%, and 0% of the LTC service charges if coming from a non-low, mid-low, and low-income household, respectively, and the financial subsidies are mainly provided by the central government.

To facilitate service delivery and reform the LTC policies, the new government launched the LTC 2.0 policy in 2016. According to the government's LTC 2.0 policy [1], formal care delivery includes the eight main types of services covered in the LTC 1.0 policy, expanded to include more services in the community, such as health promotion, frailty prevention, a care management network, also caregivers' support program, and so on. LTC 2.0 policy is seen as a reform of the LTC 1.0, and the home services alone, apart from other home nursing and home rehabilitation, still remains as the top commonly used services.

The Utilizations of Needs-Led Home Services

By the definition of long-term care mentioned above, although the functional disabilities among most of the care recipients are irreversible, the conceptual framework of health care utilization drawn from Andersen and Newman's health behavioral model [9] can

be applied in this work as in previous research [10], which focuses on factors that influence and predict the use of health care services [8]. The three main categories in the model include: (a) need factors, which are defined as health problems; (b) predisposing factors, which are defined as characteristics associated with the likelihood of using health care; and (c) enabling factors, which are defined as individual and community level characteristics that are associated with the ability to access health services [8].

The decision to use home services should also be based on individual needs as well as other predisposing and enabling factors. The decreasing trend with regard to the number of people living in households and the rise in the number of women participating in the labor force both impact the capability of providing caregiving and support within family networks. More families in Taiwan have thus hired foreign care workers to take care of their parents or elderly relatives, with the number reaching up to more than 243,000 such caregivers by the end of June 2017 [11]. This means that approximately one-third of households with long-term care needs now make use of foreign care workers. Similarly, the home services provided by the HCBS have been the most commonly used type of services since the formal long-term care system was launched in 2007, and thus there is a clear demand for delivering services to people's own homes. The home service delivery in Taiwan was originally part of the domiciliary care program set up by the Ministry of Interior in 1992, and was renamed "home service" in 2002, with universal coverage of such needs being provided.

Due to limitations with regard to the informal caregiving resources in many households, a number of non-profit organizations provide home services by contract with the government, offering a form of supplementary home care that can help support the informal caregiving networks that exist within families. According to the LTC policy 1.0, the LTC recipients can get care services for up to 25, 50, and 90 hours per month based on their dependency status for mild, moderate, and severe dependency, respectively. However, according to official statistics, the subsidies for home services are often insufficient due to a lack of resources, often being as low as subsidies for just 13, 24, 32 hours of care for those with mild, moderate, and severe dependency [1], well below the standards listed in the LTC policy.

Regarding the influencing factors of home services utilization, previous research showed the impact of health insurance on access to care and utilizations [12]. Research on income and the utilization of long-term care services also showed how individual incomes or social security benefits influence the utilization of paid home care services [13]. Moreover, a previous study evaluating long-term care policy options indicated that the availability of informal care, which is determined through intra-family bargaining, responds strongly to any official long-term care policy, and there are large welfare gains from a combination of informal care and formal care subsidies [14]. Previous research in Taiwan also showed that the specific socio-demographic and functional characteristics were the significant factors influencing utilization of home services, which were also intervened by financial means [15]. The research found that two third of the home service care recipients were satisfied with the services, however, as many as 46% expressed unmet needs. Kersten surveyed a variety of needs among patients with multiple sclerosis who reported on average 2.9 unmet needs for themselves and their carers and professionals reported on average 2.4 [16]. In the meantime,

the primary caregivers (mainly women) are the key users in long-term care system and their needs were often neglected in policy making [17].

The concept of unmet need includes both the accessibility, availability or adequacy of care assistance [18]. It remains unclear under the Taiwan LTC policy, however, whether the currently lower level of subsidies provided for formal home services influence the utilization behavior, or if the services provided match the needs of care recipients and family caregivers. When a person is in need of long-term care services, a lack of sufficient care can have negative consequences that may compromise a person's safety in the community and impede the management of health problems [18]. Previous research showed that greater unmet needs predicted worse outcomes, such as nursing home placement, death, and loss to follow-up [19] and people who report unmet need tend to be in worse health and with lower income [20]. To the best of our knowledge, the utilization behavior (use or not to use) of formal home services and issue related have not yet been examined with regard to the HCBS of Taiwan.

In order to improve the home service delivery, it is essential to better understand the causal relationships among older adults' personal factors, home services use, and the ability to reside in the community, with these issues ideally examined from a longitudinal perspective. Therefore, the aim of this study is to examine the profile of home services utilization and the reasons for case closures in two years, as well as the related influencing factors, among home service recipients in Taiwan. It is hoped that the knowledge gained with regard to utilization behavior and potential influencing factors will provide useful information for the LTC 2.0 policy reform, and thus improve the delivery of needs-led home services in Taiwan.

MATERIALS AND METHODS

Data Source and Study Design

The data came from the long-term care dataset for people with LTC needs in Taiwan. Starting in 2008, the dataset has been maintained in each county in which the health indicators of care recipients were recorded in initial needs assessments, as well as in the reassessments that are carried out every six months by care managers during the follow-up process. The accessibility of dataset can be applied through the local government for regional data usage when the study was conducted.

Settings and Participants

In this study, we approached and analyzed the long-term care dataset of one southern city, one of the six major metropolitan areas in Taiwan. Currently, only LTC recipients who receive the HCBS noted above are recorded in the dataset. When data for the present study was collected in 2016, a total of 10,450 care recipients aged 50 and over had initial needs assessment (T0) records from 2011-2015 kept in the dataset. That is, the potential needs of these care recipients were identified through the needs assessment process.

After cleaning data to exclude those with no dependency that had been identified, and no subsidies paid during the data collection period, a total of 9,889 persons had records for the initial need assessments (T0) with home service subsidies. Among these, 6,137 had one reassessment at six months (T1), 3,490 persons had records for reassessments through one year (T2), 2,214 for reassessments through one and half years (T3), 1,398 for reassessment through two years (T4), 848 for T5 and above.

Measurements

In the long-term care dataset, the need assessment instrument included social-demographic variables (i.e., gender, age, living status, educational levels, social welfare status), dependency levels (i.e., activities of daily living (ADLs), instrumental activities of daily living (IADLs)), cognitive impairments and depressive tendency; and also living area, subsidy gap, and caregiver burden etc. The variables of caregiver burden score and the subsidy gap were important variables regarding unmet need in the study. Among them, the caregiver burden (total scores) consists three aspects of physical health, psychological status, and family interactions, ranging from 3-12 points and the higher score means higher caregiver burden. The subsidy gap per month has been calculated by the standard subsidy hours each dependency level listed deduced the actual subsidies issued by care managers to each care recipient in practice.

Data Analyses

The data analyses for this study included descriptive and inferential statistics. A description of the study samples and univariate analyses between the independent variables and dependent variables was first conducted. Secondly, the Cox Regression Analyses [21] were used to examine the potential risks factors for case closures. Each test of the model parameters was two-sided and compared with the control at the 0.05 level of significance. All analyses and figures were performed using SPSS version 17.0. The study protocol (No: A-ER-104-384) was approved by ethic committee, and no conflicts interest existed between the authors and the goals of this study.

RESULTS

Basic Information of the Home Services Utilization

Table 1 shows the detailed profile of the 9,889 cases who received home services during 2011-2015. Among the recipients, the average age was 80.56 and 58% were women. In terms of living status, the largest group of them lived with their children (31%), followed with spouse only (24%), with spouse and children (19%), and 20% of them lived alone. More than half of the care recipients were illiterate (52%), and 29% had only an elementary school education. Regarding their social welfare status, most of them were from non-low-income households (84%). and 16% from either mid-low- or low-income households. The cognitive status and the dependency levels of the home service care recipients were identified by care managers through the needs assessments and there were 33%, 24% and 43% identified as the mild, moderate and severe dependency levels at the initial need assessment (T0), respectively. The subsidy gap was 33.92±26.68 hours on average and the caregiver burden measured by using the caregiver burden score (3-12) in the need assessment was 4.38±1.19.

The Time Duration and Patterns of Home services Utilization

Table 2 shows the percentages of average time duration for receiving home services among the care recipients examined in this work. In total, 23% of the care recipients left the services within 180 days, and 17% within one year. Another 13% left the services after between one to two years, and about 39% still received home services during the follow-up time period. Among those who left the services earlier (within 180 days), the majority were care recipients from non-low-income

Table 1.　Basic information of the home services utilization in long-term care dataset

Variables	N		%	p value
Gender				<0.001
Female	5,779		58	
Male	4,110		42	
Age group				<0.001
50-64 yrs	945		10	
65-74 yrs	1,474		15	
75-84 yrs	3,798		38	
85 yrs and over	3,672		37	
Living Status				<0.001
With children	3,075		31	
With spouse only	2,380		24	
Living alone	1,930		20	
With spouse and children	1,871		19	
Living with grandchildren or relatives	527		5	
Others	106		1	
Educational levels				<0.001
Illiterate	5,135		52	
Elementary school	2,844		29	
Junior high school	747		8	
Senior high school	692		7	
College/above degree	377		4	
Others	94		1	
Social Welfare Status				<0.001
Non-low Income households	8,254		84	
Mid-low income households	824		8	
Low income households	811		8	
Dependency Levels				<0.001
Mild	3,260		33	
Moderate	2,344		24	
Severe	4,285		43	
Age (years)	80.56	±	10.17	
Subsidy gap (hours)	33.92	±	26.68	
Caregiver burden (total scores)	4.38	±	1.19	

Note: 1. N=9,889 for LTC recipients with the baseline and at least one afterwards reassessment.
　　　2. The LTC dataset from one metropolitan city in 2011-2015.
　　　3. Age, Subsidy gap, Caregiver burden: Mean ± SD.
　　　4. The caregiver burden (total score) is ranging from 3-12 and the higher score means higher caregiver burden.

households (89%) and with severe dependency (51%). Among those care recipients continuing receiving the services (n=3,890), more of those with a mild dependency (36%) than those who left within half a year (27%).

The Reasons for Case Closure of the Home Service Recipients

In terms of the reasons for case closure (Table 3), it was found that there were 1,966 cases that died (20%); 4,033 (41%) who

Table 2. The percentages of social welfare status and dependency levels in each time duration for receiving home services

Time duration Variables		≤180 days	181-365 days	366-730 days	≥731 days	Still receiving home services	Total
Total		2,236 (23%)	1,658 (17%)	1,238 (13%)	867 (9%)	3,890 (39%)	9,889(100%)
Social Welfare Status	Non-low	1,989 (89%)	1,464 (88%)	1,049 (85%)	705 (81%)	3,047 (78%)	8,254 (84%)
	Mid-low	128 (6%)	111 (7%)	91 (7%)	70 (8%)	424 (11%)	824 (8%)
	Low	119 (5%)	83 (5%)	98 (8%)	92 (11%)	49 (11%)	811 (8%)
Dependency Levels	mild	598 (27%)	565 (34%)	427 (34%)	265 (31%)	1,405 (36%)	3,260 (33%)
	moderate	499 (22%)	391 (24%)	293 (24%)	227 (26%)	934 (24%)	2,344 (24%)
	severe	1,139 (51%)	702 (42%)	518 (42%)	375 (43%)	1,551 (40%)	4,285 (43%)

Note: 1. N=9,889 during the data collection period from 2011-2015.
　　　2. Unit: persons (%) and the percentages are calculated by each row.

Table 3. The reasons for case closure of the home services recipients

Variables	N	%	Time			
			≤180 days	181-365 days	366-730 days	≥731 days
Deaths	1,966	20	765 (39%)	477 (24%)	400 (20%)	324 (17%)
Drop-out[$]	4,033	41	1471 (37%)	1,181 (29%)	838 (21%)	543 (13%)
Hiring paid helpers/caregivers by families	1,207	30	437 (30%)	319 (27%)	284 (34%)	167 (31%)
Relocations (hospitals/institutions..etc.)	1,144	28	346 (24%)	309 (26%)	288 (34%)	201 (37%)
No willingness or refuse to use	1,011	25	377 (26%)	344 (29%)	167 (20%)	123 (23%)
Care support by families	671	17	311 (21%)	209 (18%)	99 (12%)	52 (10%)
Still receiving home services	3,890	39	-	-	-	-
Total	9,889	100				

Note: 1. N=9,889 during the data collection period from 2011-2015.
　　　2. [$] Each column calculates the percentages of reasons for drop-out.

dropped out for various reasons, but mainly to search for caregiving resources from their family networks; and 3,890 (39%) who continued receiving the home services during the data collection period from 2011-2015. Among those case closures because of death, nearly 39% (n=765) of the care recipients died within half a year of starting to receive care, another 24% (n=477) within one year, and 20% (n=400) within two years. Among those who drop out, the data also showed that nearly 37% (n=1,471) of the care recipients left the services within half year, another 29% (n=1,181) left within one year, and only 13% stayed for more than two years during the data collection period from 2011-2015. With regard to the reasons for drop-out (41%), among them, the most common were the family hiring paid helpers (30%) or care support by families (17%), being unwilling to use the services (25%), and relocations (28%).

Subsidy Hours for the Home Services

Table 4 shows the subsidies for the home services provided to the care recipients by dependency level. At the current stage, the average hours of home services utilization

Table 4. Subsidies of the home services hours by the dependency levels

Dependency Levels	Average time duration of receiving HS (per person)	Assessment	Social Welfare Status			ANOVA/ Welch$ P value	Post Hoc (Scheffe/ Games howell)
			L Mean(SD)	ML Mean(SD)	NL Mean(SD)		
Mild N=3,260	545 days ≒18.17 months	Baseline	15.05 (7.18)	16.06 (7.28)	17.58 (6.79)	<0.001	ML<NL L<NL
		Latest	20.16 (10.53)	19.14 (10.21)	19.91 (10.15)	0.560	
		duration of receiving HS (days)$	747.81 (520.66)	690.86 (510.98)	510.27 (431.38)	<0.001	ML>NL L>NL
Moderate N=2,344	515 days ≒17.17 months	Baseline	25.41 (11.62)	24.37 (10.94)	25.81 (10.60)	0.213	
		Latest	27.66 (13.35)	26.63 (11.53)	27.26 (11.94)	0.742	
		duration of receiving HS (days)$	672.63 (503.72)	601.51 (478.15)	492.53 (423.73)	<0.001	ML>NL L>NL
Severe N=4,285	499 days ≒16.63 months	Baseline$	30.25 (17.03)	28.78 (15.17)	28.42 (14.54)	0.084	
		Latest$	35.99 (17.78)	31.18 (15.57)	29.63 (14.98)	<0.001	L>NL L>ML
		duration of receiving HS (days)$	613.91 (517.61)	657.15 (524.10)	469.83 (440.331)	<0.001	ML>NL L>NL

Note: 1. N=9,889 at baseline.
    2. NL: Non-low incomes; ML: Mid-low incomes; L: Low incomes.
    3. $with the use of Welch test and Post Hoc with Games Howell test.

among were ranged from 15.05 to 35.99 hours per person per month for care recipients with mild to severe dependency. A large gap was found between the standard subsidy levels (25, 50, and 90 hours for mild, moderate and severe dependency) legislated in the LTC policy and the formal home service hours issued in practice. A difference was also found in the service hours issued by the care management process at baseline and the latest assessment among the care recipients with different social welfare statuses (Table 4). In general, more hours were issued per month as time increased. However, when looking in detail, the results showed that for the care recipients with mild dependency at baseline, more hours were issued to recipients from non-low-income households, whereas more hours were issued to those from

low-income households (35.99±17.78, p<0.001) and mid-low income households (31.18±15.57, p<0.001) among those with severe dependency especially at the latest assessment. For the duration of receiving home services, it also showed apparently that those who were low-incomes and mid-low incomes stayed longer in the service system.

Factors Influencing Time for Leaving Home Services among Care Recipients

Table 5 shows the factors influencing time for leaving home services among the care recipients who dropped out in two years (n=7,923). The results showed that, comparing with the care recipients from non-low-income households, those from mid-low and low-

Table 5. Adjusted Models with the Potential Risk Factors for Leaving Home Services within two years in Cox Regression Analysis

Variables	Model I				Model II				Model III				Model IV			
	HR	LL	UL	p	HR	LL	UL	p	HR	LL	UL	p	HR	LL	UL	p
Socio-Demographics																
Male-Female	1.175	1.098	1.257	<.001	1.175	1.097	1.257	<.001	1.177	1.100	1.260	<.001	1.167	1.090	1.250	<.001
Age	1.014	1.010	1.018	<.001	1.014	1.010	1.017	<.001	1.013	1.010	1.017	<.001	1.014	1.010	1.017	<.001
Illiterate (ref. Literate)	1.007	.940	1.079	.851	.993	.926	1.065	.836	1.003	.934	1.077	.929	1.000	.931	1.074	1.000
Mid low-income households (ref. Non low-income households)	.583	.503	.677	<.001	.581	.501	.674	<.001	.581	.501	.674	<.001	.581	.501	.674	<.001
Low-income households (ref. Non low-income households)	.486	.420	.563	<.001	.488	.421	.565	<.001	.488	.421	.566	<.001	.487	.420	.564	<.001
Living with others (ref. Living alone)	1.029	.954	1.111	.453	1.013	.935	1.097	.761	1.010	.932	1.094	.814	1.009	.931	1.093	.831
Dependency levels																
Moderate dependency at baseline (ref. Mild)					1.058	.975	1.147	.174	1.048	.956	1.148	.322	1.030	.939	1.129	.537
Severe dependency at baseline (ref. Mild)					.991	.916	1.072	.813	.952	.811	1.116	.541	.917	.780	1.078	.298
Mild cognitive imp at baseline (ref. No cog. imp.)					1.045	.955	1.144	.334	1.048	.958	1.147	.308	1.044	.954	1.143	.345
Moderate cognitive imp. at baseline (ref. No cog. imp.)					1.135	1.037	1.241	.006	1.131	1.034	1.237	.007	1.125	1.028	1.231	.010
Severe cognitive imp. at baseline (ref. No cog. Imp.)					1.102	.995	1.221	.062	1.100	.993	1.219	.068	1.098	.991	1.216	.073
Caregiving Resources																
Remote Area (ref. Urban area)									.943	.879	1.012	.105	.927	.863	.996	.038
Subsidy gap (hours)#									1.001	.998	1.003	.523	1.001	.999	1.004	.394
Caregivers' Characteristics																
Caregiver burden (total scores)*													1.041	1.014	1.069	.003
Wald Chi-Square	313.64***				325.78***				328.84***				337.48***			
AIC	67197.44				67185.81				67182.71				67174.09			

Note: 1. N=7,923.
2. Cox Regression (Dropout Events =4,033 leaving home services). We tested for the proportional-hazards assumption. The test was not significant for each for the covariates, and the global test was also not statistically significant. Therefore, we could assume the proportional hazards.
3. AIC, Akaike Information Criteria; HR, Hazard Ratio; LL, Lower Limit of 95% CI; UL, Upper Limit of 95% CI.
4. # the subsidy gap per month was calculated by the standard subsidy hours each dependency level listed deduced the actual subsidies issued by care managers to each care recipient in practice.
5. * the caregiver burden (total score) is ranging from 3-12 and the higher score means higher caregiver burden.

income households were less likely to leave the service system (HR=0.581; HR=0.487 in the full model, p<0.001). In terms of health status, those recipients with moderate cognitive impairments tended to leave the home services earlier than those with no cognitive impairment (HR=1.125 in the full model, p<0.05). In terms of the factors related to informal caregiving, it was found that importantly, the caregivers' burden had a significant influence on when the recipients stopped getting home services (HR=1.041, p<0.01).

DISCUSSIONS

Branch indicated that fundamental questions for any social service delivery system are who gets services, what kind of services they get, who pay for the services, and who monitors the quality [22]. Given the need and acceptability of home services in Taiwan and to improve service planning and capacity, it is important for policy makers and practitioners to examine the home service delivery and utilization in details. This study examined the utilization of home services during 2011-2015 based on a long-term care data set for one southern city in Taiwan. During this time period, home service delivery was the most used aspect of HCBS. The goal of such services is to provide personal care and carry out household errands to maximize the independence of those with long-term care needs. The results showed that the high rates of case closures (20% death and 41% leaving the services) within two years after receiving home services, as well as the factors influencing this, are discussed with the details as follows.

Irreversible Long-Term Care Needs and Outcomes

Firstly, the health status of elderly people with long-term care needs tends to be

irreversible and rapidly changing. With the increasing age and health deterioration of the care recipients, mortality and relocations may be inevitable. Our findings showed that a 20% death rate within two years of utilization seemed also related to the increasing age and deterioration of the care recipients' functional levels. It is also showed in previous studies that disabled people and those with moderate and severe cognitive impairments face a higher mortality risk [23], and greater limitations with regard to their instrumental activities of daily living [24].

Why Not Use and the Potential Influencing Factors

However, the primary interest of this study was to find why not use and the influencing factors for the high rate of case closures in home service delivery found in this study. Previous research showed that greater unmet needs are predictive of nursing home placement, death, and loss to follow-up [19], while older adults with unmet needs had an approximately 10% increased risk of mortality compared with those whose needs were met when demographics were controlled for [25].

This study identified those individuals with higher caregiver burden tended to leave the services. It seemed inconsistent with the idea that informal caregiver burden may be associated with formal home care services use [26]. However, research also showed that a lower level of informal support has been shown the factor causing unmet need [27] and greater unmet need influencing drop-out [19]. If the home service delivery meet care needs of the long-term care recipients should be further examined. However, since it was found that those with moderate cognitive impairments tended to leave the services than those without and there was no other significance of the physical and cognitive health status predicting

the dropout, it seemed currently no evidence to show that leaving the services were simply because of getting better of health.

Previous research showed that greater age and poorer socioeconomic conditions were the main factors associated with unmet health care needs [20, 24]. A previous study in the US [27] indicated that home-based programs were the most commonly used HCBS, although they were only used by a third of the studied sample, the most common reason for this figure was a lack of awareness with regards to the various types of HCBS available. Research also showed that the factors associated with unmet needs included ethnicity, greater care needs (functional limitations and behavioral problems), and a low level of informal support (in terms of substitute help and family agreement). More, the prevalence of unmet needs may be higher in minority and low-income community residents, as well as with caregivers that have lower education levels, and individuals with early-stage dementia [28]. Apart from age and gender, the findings as shown in Table 5, also showed that in addition to the cognitive status, those care recipients from more economically disadvantaged groups (i.e., from mid-low- and low-income households) were less likely to leave the services. Therefore, not only need factors but also predisposing and enabling factors influence the utilization of care, while the decision to use or not use such care is influenced by a combination of government policy as well as the individual level factors such as health status, financial means and informal caregiving resource or burden.

In fact, under the influence of traditional Chinese culture, the decision to seek care is made usually within a family context as Taiwanese elderly people still tend to rely on their family network when making important decisions [29, 30]. If the home services were actually useful and number of subsidy hours insufficient, then it is odd that why the caregivers or family members did not choose to purchase more within the system, but instead choose to use with less-copayment or leave. In Taiwan, as many as one third of families with long-term care needs now hire foreign care workers to do such work [31]. The cost of this is around 700 USD per month, which is much higher than purchasing more home service hours (with a 7.00 USD co-payment per hour). However, this is believed that foreign care workers can take care of other household duties, as well as cover any care needs 24 hours a day. This thus provides considerable extra labor if a family can afford it, with more work being done than is possible with a formal home service care worker. Moreover, the high rates of users leaving the formal home service system reveals the preferences of family members and users with more financial resources. In contrast, those users from mid-low and low-income households were less likely to leave the formal home service system. It is critical to explore further whether their needs been met/satisfied or because of no other alternative/choice under the condition of their financial means.

The Policy Implications

According to the LTC policy, the function of formal HCBS, such as the home service delivery examined in this study, are to supplement informal caregiving and help to maintain family support at the care recipients' own homes. This policy universally covers those with long-term care needs both from low and non-low incomes. As such, why did many care users choose not to use this social welfare services if it was both necessary and needs-led? Could be the high dropout rates due to unmet needs because of insufficient services hours, specific personal care needs or care quality? If

the patterns or contents of formal home services has a needs-led gap, then is the increasing usage of foreign care workers a realistic substitute for family support or vice versa? Our findings provide empirical evidence for the high dropout rates, and thus it is critically important that further qualitative-approached research explore the reasons for such service gaps in-depth.

In Taiwan, the LTC policy has expanded the HCBS universally with the aid of co-payments. Although home services are the most common used services in HCBS in its current form, there seemed an existing service gap. The high dropout rates reflect the preferences and decisions of care recipients and their families. The government's aim of taking care of families with LTC needs by providing local care workers, and thus reducing the need for foreign care workers, has not yet been achieved. Moreover, there has been a growth in the number of caregivers (such as CNAs) and subsidies for home services left behind [1]. These long-term care resource issues may also impact on the care management process. For example, it was found in the current study that social welfare status matters with regard to deciding who gets what and how much. This seems to be also related to the recognition of care managers that they need to cover more for their clients from low-income households based on limited resources.

Regarding caregiving resources in the community, many volunteer organizations currently undertake home service projects in the long-term care system that were contracted out by local governments in Taiwan. In addition to such service contracts, these non-profit organizations tend to lack the funds and manpower needed to provide such care, and so they may not actually supplement family caregivers with regard to either service quantity (i.e., there is subsidy gap) and quality (i.e., a lack of service contents), and thus more

needs to be done in terms of service contents and patterns matching the related needs. We believe that the implications of this study for home services utilization in Taiwan include as least two folds: one is that the issue of high dropout rate and needs/unmet needs should not be ignored, even the LTC policy is under the principle of social welfare mainly for those in disadvantage. The second is that the decision to choose the universal approach to cover all those in needs in the LTC policy seemed an expansion of social welfare, however, the outputs and outcomes maybe hampered because of yet prepared resources. Moreover, it is hoped that these non-profit organizations can work more on the joint public-private responsibility with the government not only serving as service providers but also fund raisers as expected and searching more resources both formal and informal to supplement the service gap.

This study has a number of limitations, as follows. First, the opinions of the care recipients and their caregivers were not collected in this work, as it relied on secondary analyses of LTC dataset. Future research could thus focus more on the perceptions of those who receive the home services and compare these with the view of those who have left such services. Secondly, the data set came from one metropolitan area in southern Taiwan, so generalization of the results should still be done with caution under the LTC policy nationwide.

Conclusion

The high rates of case closure in home services utilization reflect the need to assess service delivery in detail. This study provides empirical evidence of the high dropout rate and the importance of further investigations to explore the service gap in this context, and especially the need to give more attention to those service users who then drop out of the system. As such, this study notes that the

LTC policy needs to follow up and evaluate the effects of service provision with regard to improving its quantity, quality and efficiency in its reform process, in order to provide better support for both care recipients and their caregivers.

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台灣長照體系居家服務利用與
結案原因之影響因子探討

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　　目標：居家服務於長期照護中相當普遍，而發展以人為本的社區式服務，必須透過縱向資料的累積來了解高齡者之個人特性、服務使用與留住社區之能力。本研究目的在檢視南部某都市的居家服務利用情形、結案原因以及相關影響因素。**方法**：以南部某都市照顧管理資訊系統（LTC-CM）資料庫2011年至2015年為止曾核定使用居家服務之身心障礙者及老人現況資料進行分析，第一次需求評估中（T0）共有9,889名個案接受服務。Cox回歸分析應用於檢視服務利用兩年內結案原因分析，來找出潛在影響因子。**結果**：研究期間結案的比例偏高，其中死亡佔20%，離開服務佔41%（主因為個案之家庭網絡尋求其他照顧資源）。扣除死亡後結案的影響因子為一般戶、照顧者負荷較大、中度智力缺損者較易結案。**結論**：本研究結果實證居家服務的高結案率，建議除服務提供外，應重視個案的服務利用狀況與結案原因，建議未來進一步探討不續用服務者其產生服務缺口的原因。（台灣衛誌 2018；**37(5)**：539-553）

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