

Community Mental Health Service Use in Middle- and Old-aged Adults with Severe Mental Illnesses in Taiwan: A Preliminary Descriptive Analysis from 2002 to 2013

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Background: The 10-year long-term care 2.0 plan was launched in 2016 in responding to the challenge of a rapidly aging population in Taiwan. But the needs of middle- and old-aged adults with severe mental illnesses (SMI) may remain unmet because of vague universal umbrella of “people with physical and mentally disability.” In this study, we intended to investigate the pattern of community mental health care services (CMHS) use in Taiwan. **Methods:** Using the nationwide registered catastrophic illness dataset, we described the use patterns of four CMHS across three age groups – 40-49, 50-59, and 60+ years, from 2002 to 2013. **Results:** Relatively small proportions, mostly below 5%, of middle-aged and older SMI adults accessed different individual services, regardless of years, age groups, and diagnoses. The most frequently used service was home care (0.51%-6.18%), followed by day care hospital (0.59%-4.88%) and halfway house (0.07%-4.89%), and the least community rehabilitation center (0.02%-3.51%). The use had been increased over time with different patterns and magnitudes across age groups in each type of CMHS. Older SMI adults less frequently used CMHS. Furthermore, lower proportions of CMHS use in SMI patients with affective disorders was found as compared with non-affective psychotic disorders. **Conclusion:** The present report is the first study to delineate the CMHS use in middle-aged and older SMI adults in Taiwan.

Key words: community mental health care services, middle and old age, severe mental illness, long-term care

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Introduction

The stages of population aging are based upon the proportion of people aged 65 years and older to the whole population. Those with 7%-14% are referred as “aging societies,” 14%-21% “aged societies,” and more than 21% “hyper-aged societies” [1]. According to government statistics, Taiwan has already become an aging society since 1993. The official Population Projections for Republic of China (Taiwan) published by National Development Council in 2016 speculated that Taiwan would be an aged society in 2018 and hyper-aged in 2026 (<https://goo.gl/jUsYUo>). Negative population growth is estimated to occur between 2021 and 2025. Taken together, the burden of working-age population (15-64 years old) to support older adults will drastically increase in a near future, e.g. about 5.6 working-age people to support one older adult in 2016, 3.2 to one in 2026, and 2.2 to one in 2026 (<https://goo.gl/yN-fHWT>). Therefore, to meet the foreseeable rapidly increasing need of long-term care services is gravely important.

In responding to challenges from the aging population, the Taiwan government started a 10-year long-term care plan in 2007, to provide services for four categories of people with disability containing: (A) older adults aged 65 and above, (B) members of indigenous tribes living in high-altitude areas whose age of 55 and above, (C) people with physical or mental disabilities whose age of 50 and above, and (D) living-alone older adults with dependent instrumental activity of daily living. The Long-term Care Services Act was established in 2015 and amended in 2017 with the purpose to develop a system to ensure the quality of care and to provide affordable services. For better implementing the Act, the next-step 10-

year long-term care 2.0 plan was launched in 2016 further expanded the coverage to include: (A) people whose age of 50 years and more suffering from dementia, (B) incapable aboriginals whose age of 55 years and more from low-lying areas, (C) people with physical or mental disabilities whose age of 49 years and younger, and (D) frail older adults whose age of 65 years and above [2]. Through establishing comprehensive community-based long-term care services, the goals are to promote “aging in place,” preventive health care to diminish disabilities, and the quality of life of both care-receivers and providers [2]. Concisely, the current expected long-term care services receivers are disable older adults whose age of 65 years and above, disable aboriginals whose age between 55-64 years, those with physical and mental disability, those whose age of 50 years and above suffering from dementia, and frail older adults [2].

Despite expanded coverage, some needs in long-term care services might remain unmet in different populations. Different needs between those with dementia and other medical-illness-related disabilities have been recognized, as evidenced by that dementia became an individually listed diagnosis eligible for receiving long-term care services in the current official government document. Some hallmarks of dementia, especially cognitive impairment and behavioral disturbance, contribute to fundamental differences in service needs, e.g. assessment tools and specialized care [3]. But those middle-aged and older adults with severe mental illnesses (SMI) are still not included in the service network. Similar to dementia, SMI-related disabilities are due to the mental status, e.g. thoughts, emotions and behaviors, which renders a special consideration necessary [4]. The mental health laws and regulations underlined the uniqueness of mental health ser-

vices delivery, such as the 2007 Mental Health Act. Apparently, special needs of middle- and old-aged SMI adults have not been addressed as the current long-term care policy framework only lumps disable people with physical illness and those with mental illness together under the universal umbrella of “the disabled,” without recognizing the differences.

Only few studies have investigated community mental health service (CMHS) use among SMI patients in Taiwan [5-11] although many research examined the pattern of medical care use, some of which focused on either older adults or patients with psychiatric disorders [12-17]. To our best knowledge, this study was the first to explore the pattern of CMHS use in a targeted age population, i.e. middle- and old-aged SMI adults in Taiwan.

Methods

Data source

In this study, we used the nationwide registered catastrophic illness dataset, a specific data subset of the Taiwanese National Health Insurance Research Database (NHIRD). In brief, the catastrophic illness dataset extract information from the original claim data linked to the National Registry of Patients with Catastrophic Illness (NRPCI).

In Taiwan, the Ministry of Health and Welfare launched the National Health Insurance (NHI) program on March 1, 1995 [18]. This single-player insurance is mandatory for all residents and contracts with more than 95% health care providers, covering all health care services for more than 95% of the whole population [19]. The NRPCI is a part of the NHI program, including 30 categories of major diseases characterized by a chronic and devastating course, such as end-stage

kidney disease receiving dialysis, chronic respiratory failure requiring ventilator support, SMI, generalized autoimmune diseases, major organ transplantation, massive burns, cancer, liver cirrhosis, and so forth. The NRPCI enrollees are exempted from paying copayments for illness-related medical expenses within the NHI program. To note, the eligibility to be enrolled to the NRPCI needs to be formally reviewed by experts to ensure the accuracy, severity, and chronicity of the diagnosed disease.

Additionally, the National Health Research Institute (NHRI) in cooperation with the NHI administration has established a collection of databases, namely the NHIRD, for research purpose. For the privacy and confidentiality, the NHIRD uses encrypted information that can be used to identify specific person. The nationwide registered catastrophic illness dataset includes information about sex, date of birth, dates of visits, diagnoses based on *International Classification of Diseases, Ninth Revision (ICD-9)* classification, and details of ambulatory medical services.

Target population

The target population in this study included middle- and old-aged SMI adults from 2002 to 2013 in Taiwan. People aged 40-59 years were defined as middle-aged, and 60 years and more as old-aged. The reason to set the cut-off age as 40 years was the assumed raised needs in long-term CMHS among SMI patients whose age of 40+ years because ones of the most probable caregivers, their parents, are likely as old as at least 60-70 years. The SMI is defined as (nonorganic) non-affective psychotic disorders, bipolar affective disorder and major depressive disorder, based on the *ICD-9* codes as follows: 295 (schizophrenia) and 297 (delusional disorder) for the former, and 296 (affective disorders) for the latter twos.

Information about types of mental health services used is extracted according to reimbursed treatment items, including community rehabilitation center, halfway house, home care, day care hospital and chronic psychiatric ward. Since the service use was ascertained year by year, use patterns among different mental health services were not mutually exclusive. This study was approved by the institutional review board with the waiver to obtain informed consents.

Statistical analysis

We used descriptive analysis to investigate characteristics of CMHS use by middle-age and older SMI adults in Taiwan from 2002 to 2013. Age was categorized into 3 strata, i.e. 40-49, 50-59, and 60+ years. Across those three age strata, we examined four types of use of CMHS covered by the NHI program (community rehabilitation center, halfway house, home care, and day care hospital). As a comparison, chronic psychiatric ward hospitalization was also inspected to reflect the need of another relatively long-term mental health care. In addition to treating patients with SMI as a whole, the pattern of mental health services use across different age strata among patients with non-affective psychotic disorders and those with affective disorders was further investigated, respectively. The trends of those use patterns over time were analyzed year by year, from 2002 to 2013.

We computed descriptive analysis with Statistical Analytical System software version 9.4 (SAS Institute Inc., Cary, North Carolina, USA), and plotted figures with STATA software 11.2 (StataCorp LP, College Station, Texas, USA). In this study, we directly analyzed the target population, no inferential statistics analysis was needed, such as *t* test or analysis of variance (ANOVA).

Results

The number of all SMI patients registered in the NRPCI was increased steadily from 122,846 in 2002 to 152,364 in 2013.

Table 1 shows the distribution of middle- and old-aged adults with severe mental illness from 2002 to 2013 in Taiwan. Table 2 describes the use of CMHS and chronic ward in middle- and old-aged adults with severe mental illness across 3 different time points from 2002 to 2013 in Taiwan. Table 3 compares the use of CMHS and chronic ward between middle- and old-aged adults with non-affective psychotic disorders and affective disorders across 3 different time points from 2002 to 2013 in Taiwan. Figure 1 depicts the use patterns of CMHS among middle- and old-aged adults with severe mental illness in Taiwan from 2002 to 2013. Figure 2 depicts the use patterns of CMHS among older adults whose age of 60 and more with severe mental illness in Taiwan from 2002 to 2013. Figures 3 compares the use patterns of CMHS among three age groups of adults with severe mental illness in Taiwan from 2002 to 2013.

Discussion

The present study described patterns and time trends of CMHS use in middle- and old-aged SMI adults in Taiwan from 2002 to 2013. Regardless of year, age groups and diagnoses, relatively small proportions of middle-aged and older SMI adults accessed each of these services, most of which below 5% (Tables 2 and 3). The most frequently used service was home care, followed by day care hospital and halfway house, and the least community rehabilitation center (Figure 1). The use was increased over time with

Table 1. The distribution of middle- and old-aged adults with severe mental illness from 2002 to 2013 in Taiwan

year	mid- and old-aged [§] SMI		40-49 y SMI		50-59 y SMI		60+ y SMI		All SMI
	N	(%) [†]	n	(%) [‡]	n	(%) [‡]	n	(%) [‡]	n
2002	70,670	(57.53)	31,121	(25.33)	18,656	(15.19)	20,893	(17.01)	122,846
2003	78,484	(59.36)	34,490	(26.09)	21,421	(16.20)	22,573	(17.07)	132,219
2004	86,296	(60.92)	37,494	(26.47)	24,518	(17.31)	24,284	(17.14)	141,663
2005	92,715	(62.69)	39,606	(26.78)	27,609	(18.67)	25,500	(17.24)	147,903
2006	97,741	(64.62)	41,457	(27.41)	30,266	(20.01)	26,018	(17.20)	151,263
2007	101,345	(66.09)	42,486	(27.71)	32,122	(20.95)	26,737	(17.44)	153,348
2008	104,779	(67.69)	43,093	(27.84)	34,059	(22.00)	27,627	(17.85)	154,801
2009	108,909	(69.40)	43,798	(27.91)	36,179	(23.05)	28,932	(18.44)	156,925
2010	112,176	(71.02)	44,051	(27.89)	37,846	(23.96)	30,279	(19.17)	157,945
2011	113,576	(72.46)	43,135	(27.52)	38,646	(24.66)	31,795	(20.29)	156,735
2012	115,362	(74.13)	42,239	(27.14)	39,727	(25.53)	33,396	(21.46)	155,622
2013	115,698	(75.94)	40,757	(26.75)	40,479	(26.57)	34,462	(22.62)	152,364

For patients who were middle- and old-aged, both the number and the proportion to all patients was constantly increased during the study period. Likewise, similar trends could be found in 2 of 3 age strata (i.e. 50-59 years, and 60+ years). As for the age strata of 40-49 years, the patient number and the proportion to all the middle- and old-aged continued to raise until around 2010, and then began to decrease gradually.

[§] Mid- and old-aged: those whose age of 40 and older

[†] The proportion of the number of SMI adults whose age of 40 years and older to all SMI individuals

[‡] The proportion of the number of SMI adults within specific age groups to all SMI individuals

SMI, severe mental illness; y, year-old

different patterns and magnitudes across age groups in each type of services. Older SMI adults whose age of 60+ years did less frequently access services (Figure 3). Furthermore, SMI patients with affective disorders tended to use CMHS less than those with non-affective psychotic disorders (Table 3).

As the whole population was aged, a large increase in the proportion of patients with SMI who aged 40 years and more, i.e. from nearly one-half to three-fourths, made the whole SMI population get older, which was accounted for by more significantly inflated populations of those who aged between 50 to 59 years and those 60+ years. Those figures could have some implications in long-term care services delivery.

First, unmet needs existed in older SMI adults in Taiwan. When SMI patients enter their 40s of age, their parents, usually the main care takers, may become less capable to ensure appropriate medical and mental health care to be delivered to the patients because their own ages should be at least 60-70 years [20]. Less available supports from family members are expected while SMI patients get older [21]. As a result, older SMI adults have more needs from long-term care services. But the proportions of CMHS use were smallest compared to that of SMI patients with 60 years and older.

Second, the needs may differ between different psychiatric diagnoses, suggested by two findings from this study (Table 3). One is the different

Table 2. The use of community mental health services and chronic ward in middle- and old-aged adults with severe mental illness across 3 different time points from 2002 to 2013 in Taiwan

	2002			2007			2013		
	40-49 y	50-59 y	60 + y	40-49 y	50-59 y	60+ y	40-49 y	50-59 y	60 + y
Patient number	31,121	18,656	20,893	42,486	32,122	26,737	40,757	40,479	34,462
Community rehabilitation center (%) [§]	216 (0.69)	70 (0.38)	17 (0.08)	933 (2.20)	404 (1.26)	74 (0.28)	1,104 (2.71)	693 (1.71)	186 (0.54)
Halfway house (%) [§]	430 (1.38)	219 (1.17)	88 (0.42)	1,098 (2.58)	751 (2.34)	230 (0.86)	1,438 (3.53)	1,318 (3.26)	547 (1.59)
Home care (%) [§]	888 (2.85)	440 (2.36)	369 (1.77)	1,683 (3.96)	1,029 (3.20)	673 (2.52)	1,846 (4.53)	1,707 (4.22)	1,060 (3.08)
Day care hospital (%) [§]	1,080 (3.47)	389 (2.09)	155 (0.74)	1,575 (3.71)	812 (2.53)	289 (1.08)	1,601 (3.93)	1,148 (2.84)	465 (1.35)
Any one of above services [†] (%) [§]	2,132 (6.85)	887 (4.76)	538 (2.58)	4,082 (9.61)	2,211 (6.88)	1,030 (3.85)	4,456 (10.93)	3,502 (8.65)	1,693 (4.91)
Chronic psychiatric ward (%) [§]	4,111 (13.21)	2,149 (11.52)	1,139 (5.45)	5,330 (12.55)	3,834 (11.94)	1,623 (6.07)	4,660 (11.43)	4,932 (12.18)	2,666 (7.74)

Chronic psychiatric ward as a long-term mental health care provided by hospitals did not have any significant changes in the proportion of service use, around 10% (detailed data not shown).

[§] the proportion of adults with severe mental illness who used left-side listed service within specific age groups

[†] The use of four types of community mental health services was not mutually exclusive.

y, years

age distribution (Table 2). In 2013, the population size of age groups in patients with non-affective psychotic disorders was: 40-49 > 50-59 > 60+ years, whereas affective disorders: 40-49 < 50-59 < 60+ years (Table 2). Possible explanations include administrative reasons and excess mortality. In the initial years since the NHI program had been implemented, the eligibility review for affective disorders was relatively less strict. In 2010, the NHI administration further set a two-year validity time frame for affective disorders, which required those NRPCI enrollees to be reviewed again two years later to update the validity as life-long (<https://goo.gl/b4gZzJ>). In other words, these administrative changes might differentially make the age distribution bias toward older ages later around years close to 2013. The excess mortality of SMI patients is well-known [22-25]. A recent

research has delineated two- to three-fold standardized mortality rates (SMRs) in both patients with schizophrenia and bipolar disorder in Taiwan, between which greater SMR for younger adults with bipolar disorder (age 15-44 years) but lesser for older (age 45+ years) [26]. The other important finding was the obviously lower use in each age strata of SMI patients with affective disorder as compared with their counterparts with non-affective psychotic disorders. Further research is needed to be determined whether SMI patients with affective disorders really have lower needs because of better family support and reserved functioning, or whether their needs have been neglected.

Third, the rôles of different CMHS should be discussed. Among different service types, no clear-cut distinction existed about receivers' char-

Table 3. The comparison of use of community mental health services and chronic ward between middle- and old-aged adults with non-affective psychotic disorders and affective disorders across 3 different time points from 2002 to 2013 in Taiwan

Year 2002	Non-affective psychotic disorders			Affective disorders		
	40-49 y	50-59 y	60 + y	40-49 y	50-59 y	60 + y
Patient number	21,441	11,073	7,746	9,680	7,583	13,147
Community rehabilitation center (%) [§]	199 (0.93)	63 (0.57)	14 (0.18)	17 (0.18)	7 (0.09)	3 (0.02)
Halfway house (%) [§]	413 (1.93)	209 (1.89)	79 (1.02)	17 (0.18)	10 (0.13)	9 (0.07)
Home care (%) [§]	839 (3.91)	397 (3.59)	281 (3.63)	49 (0.51)	43 (0.57)	88 (0.67)
Day care hospital (%) [§]	909 (4.24)	289 (2.61)	77 (0.99)	171 (1.77)	100 (1.32)	78 (0.59)
Any one of above services [†] (%) [§]	1,901 (8.87)	739 (6.67)	369 (4.76)	231 (2.39)	148 (1.95)	169 (1.29)
Chronic psychiatric ward (%) [§]	3,914 (18.25)	2,035 (18.38)	1,019 (13.16)	197 (2.04)	114 (1.50)	119 (0.91)
Year 2007	Non-affective psychotic disorders			Affective disorders		
	40-49 y	50-59 y	60 + y	40-49 y	50-59 y	60 + y
Patient number	27,990	18,366	10,684	14,496	13,756	16,053
Community rehabilitation center (%) [§]	849 (3.03)	361 (1.97)	62 (0.58)	84 (0.58)	43 (0.31)	12 (0.07)
Halfway house (%) [§]	1,020 (3.64)	698 (3.80)	212 (1.98)	78 (0.54)	53 (0.39)	18 (0.11)
Home care (%) [§]	1,567 (5.60)	926 (5.04)	550 (5.15)	116 (0.80)	103 (0.75)	123 (0.77)
Day care hospital (%) [§]	1,367 (4.88)	642 (3.50)	172 (1.61)	208 (1.43)	170 (1.24)	117 (0.73)
Any one of above services [†] (%) [§]	3,687 (13.17)	1,903 (10.36)	781 (7.31)	395 (2.73)	308 (2.24)	249 (1.55)
Chronic psychiatric ward (%) [§]	4,978 (17.78)	3,559 (19.38)	1,478 (13.83)	352 (2.43)	275 (2.00)	145 (0.90)

(to be continued)

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Year 2013	Non-affective psychotic disorders			Affective disorders		
	40-49 y	50-59 y	60 + y	40-49 y	50-59 y	60+ y
Patient number	28,157	24,978	16,447	12,600	15,501	18,015
Community rehabilitation center (%) [§]	988 (3.51)	597 (2.39)	154 (0.94)	116 (0.92)	96 (0.62)	32 (0.18)
Halfway house (%) [§]	1,332 (4.73)	1,222 (4.89)	506 (3.08)	106 (0.84)	96 (0.62)	41 (0.23)
Home care (%) [§]	1,736 (6.17)	1,544 (6.18)	920 (5.59)	110 (0.87)	163 (1.05)	140 (0.78)
Day care hospital (%) [§]	1,360 (4.83)	902 (3.61)	310 (1.88)	241 (1.91)	246 (1.59)	155 (0.86)
Any one of above services [†] (%) [§]	3,993 (14.18)	3,007 (12.04)	1,374 (8.35)	463 (3.68)	495 (3.19)	319 (1.77)
Chronic psychiatric ward (%) [§]	4,351 (15.45)	4,600 (18.42)	2,447 (14.88)	309 (2.45)	332 (2.14)	219 (1.22)

Use patterns existed significantly differently between the middle-age and older SMI adults with non-affective psychotic disorders and those with affective disorders. For non-affective psychotic disorders, cross-sectional patient numbers among those 3 age groups followed the pattern each year: age group 40-49 years > age group 50-59 years > age group 60 + years. Longitudinally, the magnitude of increase in patients who aged 50 and older was much significant in significance power. For affective disorders, the age distribution was different from that in non-affective psychotic disorders: more patients who aged 60+ years than the other 2 age groups. Similar to non-affective psychotic disorders, the number of patients with affective disorders who aged 50 years and above was significantly increased, which made age group 50-59 years included more patients than age group 40-49 years since 2009 (detailed data not shown).

[§] The proportion of adults with severe mental illness who used listed service within specific age groups

[†] The use of four types of community mental health services was not mutually exclusive.

y, years

acteristics. Home care was no doubt assumed to be delivered to those with higher clinical severity. But some arguments existed, even could be found in official government reports, regarding the appropriate assignment of responsibilities between daycare ward and community rehabilitation center, between community rehabilitation center and halfway house, and between halfway house, psychiatric nursing home and chronic psychiatric ward (<https://goo.gl/D4Zc1h>). The actual use patterns disclosed by this study, especially two hospital-based services more frequently used than the

other twos, can invoke a discussion on the resource allocation issue [27].

Fourth, it also warranted a better integrated health care services system, incorporating both medical and mental health care services. Excess mortality in middle- and old-aged SMI adults, as aforementioned, is partially attributed to preventable chronic physical illness since they are likely to have fewer health-promoting behaviors, poorer health illiteracy, and barriers to access health care services [21, 24, 28-30]. Although vocational rehabilitation program alone is bene-

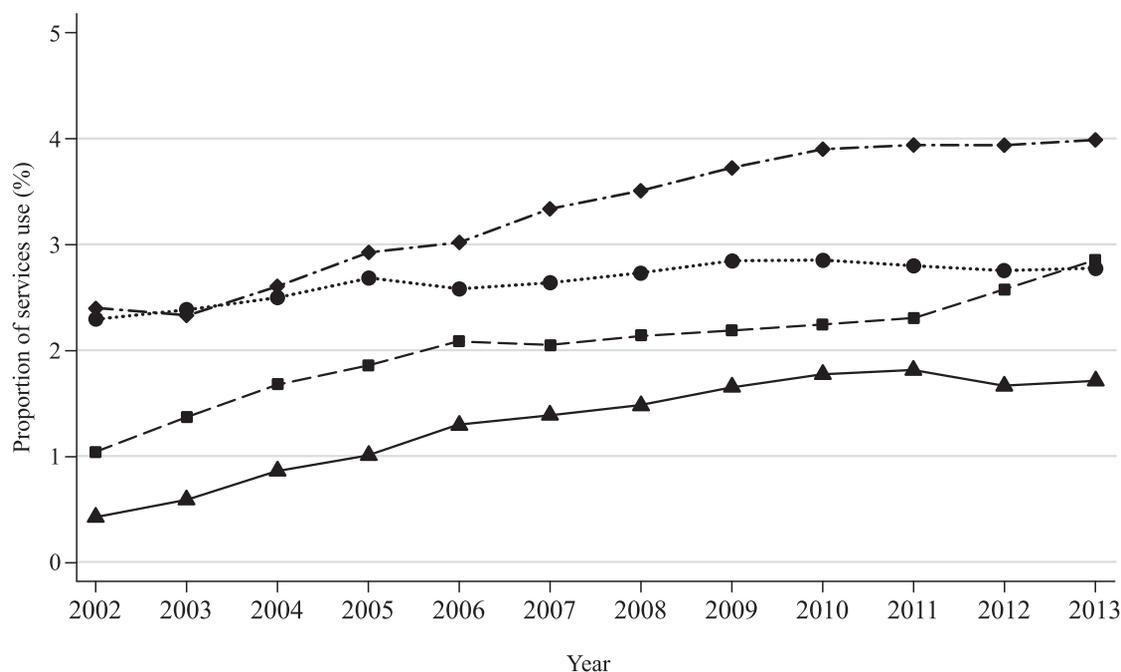


Figure 1. The use patterns of four community mental health services among middle- and old-aged adults with severe mental illnesses in Taiwan from 2002 to 2013. —▲— Community rehabilitation center, ---■--- Halfway house, ---◆--- Home care,●..... Day care hospital. The proportion of use of four CMHS was ranged from less than 0.4% to 4% in middle- and old-aged SMI adults since 2002 to 2013. Two hospital-provided CMHS, home care and day care hospital, were more frequently used. The former generally increased over time and ranked the most frequently used service most of time. The latter had been the most frequently used service initially and then maintained a relatively steady level as the second most during the majority of those years. The other two services, community rehabilitation center and halfway house, remained increasing trends over the time period, of which halfway house were more frequently used and even tied with hospital-based day care hospital in 2013.

ficial for life expectancy [31], a system-based integrated services delivery remained strongly mandatory to meet both physical and psychiatric needs [4, 28].

Fifth, the findings from the present study served as a foundation for further research to determine the extent of unmet needs through comparing perceived needs and actual services use. We need more specifically, sophisticatedly designed studies to investigate the needs for CMHS in middle-age and older SMI adults.

Study limitations

Three study limitations should be mentioned although our study used the catastrophic illness dataset to comprise all individuals with robustly diagnosed SMI as comprehensively as possible, and to gauge their CMHS use pattern over time as precisely as possible.

- Neither all SMI patients nor every single users of CMHS had been enrolled into the NRPCI. A relatively small number of individuals suffering from catastrophic illness chose not to be registered for some reasons, such as fear of stigmatization and concerns about privacy. But

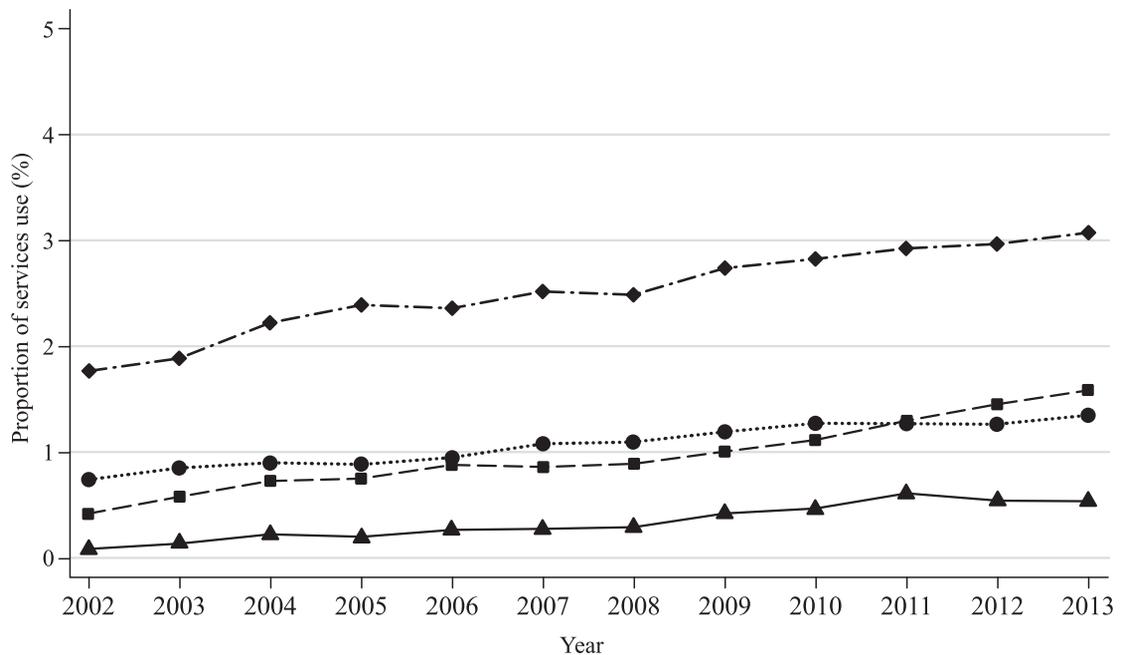


Figure 2. The use patterns of four community mental health services among older adults whose age of 60 years and more with severe mental illnesses in Taiwan from 2002 to 2013. —▲— Community rehabilitation center, ---■--- Halfway house, --◆-- Home care,●..... Day care hospital, If we further inspected use patterns in the oldest age group alone, these trends were similar but slightly different. In addition to a smaller proportion of in each service use, the number of patients attending day care hospital and halfway house were generally comparable in this age group.

the majority of CMHS users with SMI should be included in this study since they had a strong incentive to be registered because of the copayment exemption. Those SMI patients not included in catastrophic illness dataset were more likely to have no needs in those CMHS. Moreover, the figures of services use captured by the NRPCI were close to the official statistics about the distributions of services use regardless of diagnoses and registry status. Taken together, we believed that the findings obtained in the present study are valid. In addition, our study had a great advantage over others using one million random samples of NHIRD that suffered from the precision issue of estimated statistics, particularly true in the low prevalence of SMI in the general population.

- This study could not answer the question why SMI patients with affective disorders less accessed CMHS, one of the findings we unveiled. As aforementioned, some plausible explanations were suggested to be further validated in future, e.g. better family support, relatively reserved functioning or their needs to be neglected. But the possibility of competing risks could not be excluded, such as acute psychiatric ward admission or hospitalizations due to physical conditions, since we were unable to examine these data in this work.
- Only NHI-covered CMHS could be ascertained in the NHIRD. Therefore, this study could not examine some services use, i.e. nursing home and community care visits. Further research is warranted to clarify the issues.

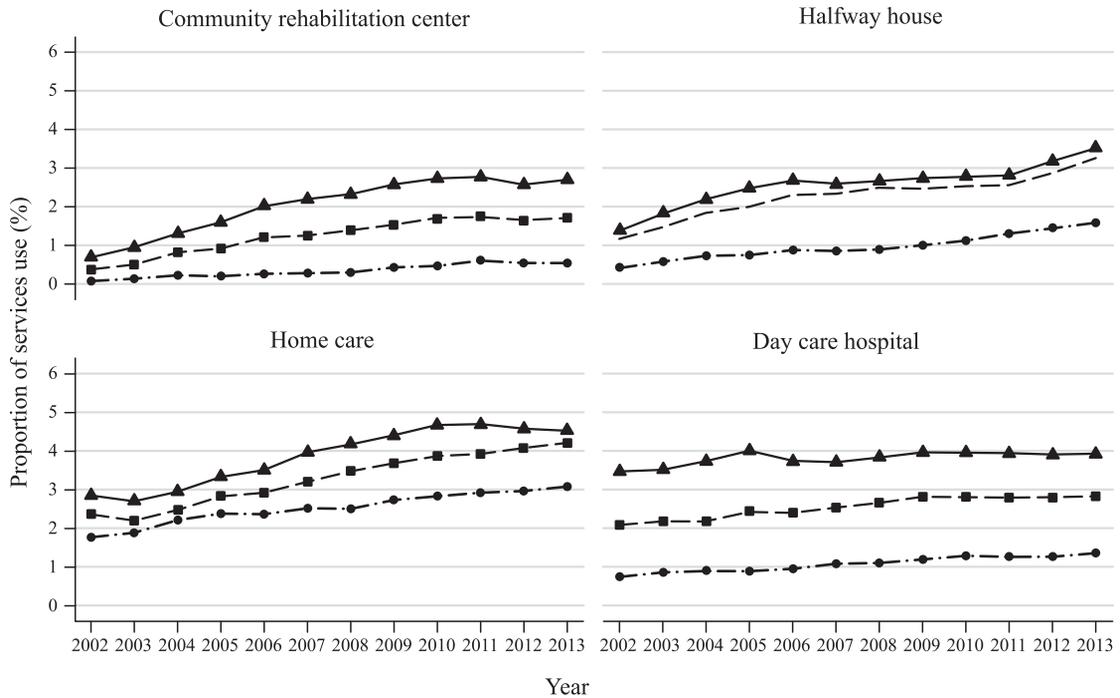


Figure 3. The use patterns of four community mental health services among three age groups of adults with severe mental illnesses in Taiwan from 2002 to 2013. —▲— 40-49y, ---■--- 50-59y, -.-●-.- 60+y, The time trends of use across three age strata within each service differed despite the highest proportion of those aged 40-49 years in all services and the lowest with 60+ years. For community rehabilitation center, the magnitude of the increased proportion of service use was not equal: age strata 40-49 years > age strata 50-59 years > age strata 60+ years, as evidenced by different slopes. Regarding halfway house, the proportion and the increased trend were comparable between age group 40-49 years and age group 50-59 years, but not age group 60+ years. The latter had increased slower in the proportion of service use. Home care showed relatively similar trends across age strata. Finally, the proportion of day care use in different age groups was basically changed little since early 2000s.

Summary

The present study is the first one to investigate the CMHS use in middle-aged and older SMI adults in Taiwan. In the era of long-term care services 2.0, our work in this study has provided information of crucial significance for future policy making, implications in CMHS delivery, and directions in further studies.

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