



ELSEVIER

Contents lists available at SciVerse ScienceDirect

Research in Autism Spectrum Disorders

Journal homepage: <http://ees.elsevier.com/RASD/default.asp>

Geographic differences in social-welfare oriented institutional care for people with disabilities in Taiwan, 2002–2009

Lan-Ping Lin^a, Shang-Wei Hsu^{b,c}, Fang-Yu Kuo^a, Jin-Ding Lin^{a,*}^a School of Public Health, National Defense Medical Center, Taipei, Taiwan^b Graduate Institute of Healthcare Administration, Asia University, Taichung, Taiwan^c Department of Public Health, China Medical University, Taichung, Taiwan

ARTICLE INFO

Article history:

Received 17 June 2012

Accepted 25 July 2012

Keywords:

Disability

Disability institution

Institutional care

Social welfare

ABSTRACT

The present paper aims to provide information of long-term trend of distribution and utilization of institutional care resource for people with disabilities by different geographic areas in Taiwan. Data were analyzed using governmental reported general population by administrative area, population of persons with disabilities, and the profile of disability service institutions in Taiwan-Fuchien Area from 2002 to 2009. Results revealed that there were averagely 956,549 persons with disabilities and 15,172 institutional service beds (15.86 beds per 1000 persons with disabilities; range = 0–33‰) and the mean occupancy rate was 79% (area range: 36.26–92.09%). during the past 8 years. Many rural countries and off-shore islands have poorer disability service beds than other urban cities. The results also showed that the disability population ($R^2 = 0.093$, $p < 0.001$), institutional service beds ($R^2 = 0.885$, $p = 0.001$) and occupied service beds ($R^2 = 0.917$, $p < 0.001$) were significantly increased in curve tests during 2002–2009. However, the service beds per 1000 persons with disabilities and occupancy rate were not statistical change during the past 8 years. The study highlights the service authorities should focus on the uneven distribution problem of disability institutional care, particularly in rural countries and off-shore islands in Taiwan.

© 2012 Elsevier Ltd. All rights reserved.

1. Introduction

Beadle-Brown, Mansell, and Kozma (2007) reviewed the process of deinstitutionalization for intellectual disability services across the world, they concluded that outcomes are better in the community than in institutional care. However, deinstitutionalization has impacted health professionals (McCausland, 1987) and people living in community settings still experience institutional practices and attitudes and can lead lives that are predominantly devoid of choice, independence and inclusion (Beadle-Brown et al., 2007). Community and leisure use of people with intellectual disabilities was found to be related to the place of residence, adaptive behavior and the robustness of community goals within the service user's individual plan (Baker, 2007). Ryu et al. (2006) also highlighted that careful planning that minimized social and clinical dislocation may have contributed to the successful transition from mental hospital to community facility assessed for patients with schizophrenia.

Although there has been a decline in the number of people caring in disability institutional care in the western countries (Allen, 1989; Braddock, Hemp, & Rizzolo, 2004; Coucouvanis, Lakin, Prouty, & Webster, 2006; Fakhoury & Priebe, 2002;

* Corresponding author at: School of Public Health, National Defense Medical Center, No. 161, Min-Chun East Road, Section 6, Nei-Hu, Taipei, Taiwan. Tel.: +886 2 87923100x18447; fax: +886 2 87923147.

E-mail address: a530706@ndmctsgh.edu.tw (J.-D. Lin).

Lakin, Prouty, & Coucouvanis, 2006; Mansell, 2006; Talbott, 2004), however, there still remain a substantial increase number of institutional places for this population in Taiwan and the institutional care provided services for all ages of people with disabilities (Lin & Lin, 2009; Yen, Lin, Wu, & Kang, 2009). Our another previous study in Taiwan described the geographic distribution of institutional disability care, the results found that there was 54.9 institutional residential beds per 100,000 general population, 13.7 beds per 1000 persons with disabilities and the average use rate of the institutional care was 81.3% in the year of 2004 (Lin, Yen, Loh, & Chang, 2005). However, it is lacking the information of long-term change of disability institutional care in Taiwan. Therefore, the present paper aims to describe and test the long-term trend of distribution and utilization of institutional care resource by different geographic areas in people with disabilities in Taiwan.

2. Methods

This study analyses the geographic differences in social-welfare oriented institutional care for people with disabilities based on the data of governmental reported general population by administrative area, population of persons with disabilities, and the profile of disability service institutions in Taiwan-Fuchien Area in 2002–2009 (MOI, 2011a, 2011b, 2011c). The data sources mainly from the public free web-access information which collected by the Department of Statistics and Department of Social Welfare Services, Ministry of the Interiors, Taiwan, Republic of China. The disabled people in Taiwan must be examined and accredited by health and social welfare authorities according to the following 16 classifications: autism, intellectual disability, vision disability, hearing mechanism disability, balancing mechanism disability voice or speech mechanism disability, limb disability, loss of function of primary organs, disfigurement or deformity, chronically unconscious, senile dementia victims, chronic psychosis victims, multi-disabilities, stubborn (difficult-to-cure) epilepsy, caused by infrequent disease and other disabled citizens (The Taiwan Physically and Mentally Disabled Citizens Protection Act, 1997).

We analyzed data includes the resources of institutional care which include residence full day services, day care services and other services, the institutional service capacity (beds) and its occupancy rate. The full-day care in the analysis means the people with disabilities living and caring in the institution for continuing 24 h per day. The day care refers to the settings providing services in day-time or hours per day. The statistical methods in the study included number and percentage to describe the profile of geographic differences in social-welfare oriented institutional care for people with disabilities, and a curve test to examine the overtime change of disability welfare resource from 2002 to 2009 in Taiwan.

3. Results

Table 1 presents the disability welfare service resource among 25 cities and counties in Taiwan, 2002–2009. In average, there were 956,549 persons with disabilities and 15,172 institutional service beds (15.86 beds per 1000 persons with disabilities) during the past 8 years. The institutional residence beds specifically located in most populous cities such as Taipei City (2215 beds), Taipei County (2127 beds), Tainan County (1489 beds) and Taoyuan County (1276 beds). The off-shore island Lienchiang County did not have any institutional disability service there. However, the available institutional service beds per 1000 persons with disabilities, the top 5 areas which owned rich resource were Hsinchu City (33.57‰), Tainan County (28.63‰), Miaoli County (25.92‰), Taichung City (24.78‰), and Tainan City (22.92‰). Beside to Lienchiang County did not have any institutional disability service, Yunlin County (1.47‰) owned the lowest available institutional service beds in Taiwan.

Table 2, Figs. 1 and 2 present data of institutional bed occupancy rate by geographic areas, the results show that the average number of users was 11,987 and the mean of occupancy rate was 79% (area range: 36.26–92.09%) in 2002–2009. There were 7 areas, their disability resource in institutional service beds were less than 11.19‰, 8 cities was 11.20–22.38‰, and 8 areas were 22.39–33.57‰. With regard to service type, 24-h full day service was provided for 67% users (area range: 16–100%), 26% day care service (area range: 0–70%) and 8% (area range: 0–22%) of other service type. The male users (60%) occupied the most of the services.

Table 3 describes and examines the trend change of disability institutional beds and occupancy rate by year from 2002 to 2009 in Taiwan. We found that the disability population ($p < 0.001$), institutional service beds ($p = 0.001$) and occupied service beds ($p < 0.001$) were significantly increased in the study. However, the service beds per 1000 persons with disabilities ($p = 0.923$) and occupancy rate ($p = 0.121$) were not statistical change during the past 8 years.

4. Discussion

People with disabilities consume a disproportionately high quantity of US Medicaid services, and their annual costs are increasing at the highest rate of all beneficiary groups (Palsbo & Mastal, 2006). The institutional care is costly and the process of de-institutionalization is still under way in most developed countries. However, Beadle-Brown et al. (2007) highlighted just moving people out of institutions into community settings does not bring about automatic improvement in quality of life in terms of choice and inclusion as well as self-identity and access to effective healthcare and treatment. The effects of deinstitutionalization may depend on national traditions and socio-cultural context, the availability of resources and financial incentives as well as specific features of the given social welfare and health care systems (Fakhoury & Priebe, 2002).

Table 1
Disability welfare service institutions by geographic area, 2002–2009.

Geographic area	Disability population (A)	Available institutional beds (B)	Available institutional beds per 1000 disability population (C) $C = B/A \times 1000$
All	956,549	15,172	15.86
Hsinchu City (HCC)	12,959	435	33.57
Tainan County (TN)	51,995	1489	28.63
Miaoli County (ML)	27,049	701	25.92
Taichung City (TCC)	32,828	814	24.78
Tainan City (TNC)	25,836	592	22.92
Hualien County (HL)	24,796	550	22.16
Hsinchu County (HC)	18,465	387	20.94
Taoyuan County (TY)	61,098	1276	20.89
Taipei City (TPE)	109,771	2215	20.17
Taipei County (TPC)	116,607	2127	18.24
Yilan County (YL)	276,66	481	17.37
Kaohsiung City (KHC)	57,790	901	15.6
Penghu County (PH)	5315	83	15.52
Changhua County (CH)	57,326	885	15.43
Chiayi City (CYC)	11,996	182	15.19
Keelung City (KLC)	16,441	220	13.37
Taichung County (TCC)	61,057	680	11.14
Nantou County (NT)	30,236	321	10.61
Kinmen County (KM)	4323	46	10.53
Pingtung County (PT)	45,633	453	9.93
Taitung County (TT)	19,010	165	8.67
Kaohsiung County (KH)	50,164	411	8.19
Chiayi County (CYC)	35,241	277	7.85
Yunlin County (YC)	52,646	78	1.47
Lienchiang County (LC)	304	0	0

Note: Kinmen County, Pingtung County, and Lienchiang County are offshore islands.

Table 2
Disability institutional bed occupancy rate by geographic area, 2002–2009.

Geographic area	Number of users	Occupancy rate	Care types			Gender of the users	
			Full day	Day care	Other	Male	Female
All	11,987	79.01	7981 (67%)	3088 (26%)	919 (8%)	7242 (60%)	4745 (40%)
Taipei County (TPC)	1660	78.02	804 (48%)	567 (34%)	289 (17%)	1020 (61%)	640 (39%)
Yilan County (YL)	397	82.52	236 (60%)	160 (40%)	1 (0%)	250 (63%)	147 (37%)
Taoyuan County (TY)	933	73.09	787 (84%)	135 (14%)	11 (1%)	554 (59%)	379 (41%)
Hsinchu County (HC)	333	86.19	282 (85%)	49 (15%)	2 (1%)	164 (49%)	169 (51%)
Miaoli County (ML)	492	70.17	411 (83%)	72 (15%)	10 (2%)	301 (61%)	191 (39%)
Taichung County (TC)	492	72.33	382 (78%)	93 (19%)	16 (3%)	292 (59%)	200 (41%)
Changhua County (CH)	631	71.32	463 (73%)	155 (25%)	13 (2%)	385 (61%)	246 (39%)
Nantou County (NC)	185	57.65	148 (80%)	35 (19%)	2 (1%)	104 (56%)	81 (44%)
Yunlin County (YC)	54	69.68	19 (36%)	34 (63%)	1 (2%)	34 (63%)	20 (38%)
Chiayi County (CY)	229	82.88	204 (89%)	19 (8%)	7 (3%)	127 (55%)	102 (45%)
Tainan County (TN)	1110	74.53	847 (76%)	143 (13%)	119 (11%)	699 (63%)	410 (37%)
Kaohsiung County (KH)	294	71.43	103 (35%)	150 (51%)	41 (14%)	189 (64%)	105 (36%)
Pingtung County (PT)	371	81.95	280 (75%)	75 (20%)	17 (5%)	225 (61%)	146 (39%)
Taitung County (TT)	103	62.17	40 (39%)	61 (60%)	2 (2%)	62 (60%)	41 (40%)
Hualien County (HL)	425	77.30	324 (76%)	100 (24%)	1 (0%)	234 (55%)	190 (45%)
Penghu County (PH)	57	68.48	24 (42%)	33 (58%)	0 (0%)	32 (56%)	25 (44%)
Keelung City (KLC)	202	92.09	115 (57%)	61 (30%)	26 (13%)	139 (69%)	64 (31%)
Hsinchu City (HCC)	353	81.06	57 (16%)	218 (62%)	77 (22%)	216 (61%)	136 (39%)
Taichung City (TCC)	620	76.19	149 (24%)	360 (58%)	111 (18%)	356 (57%)	264 (43%)
Chiayi City (CYC)	147	80.52	23 (16%)	103 (70%)	21 (14%)	97 (66%)	50 (34%)
Tainan City (TNC)	438	73.89	227 (52%)	156 (36%)	55 (13%)	246 (56%)	192 (44%)
Taipei City (TPE)	1970	88.96	684 (35%)	903 (46%)	383 (19%)	1186 (60%)	784 (40%)
Kaohsiung City (KHC)	736	81.64	337 (46%)	358 (49%)	41 (6%)	454 (62%)	281 (38%)
Kinmen County (KM)	17	36.26	17 (100%)	0 (0%)	0 (0%)	8 (50%)	8 (50%)
Lienchiang County (LC)	0	0	0	0	0	0	0

Our aims of the present paper were to examine the long-term change of distribution and utilization of institutional care resource by different geographic areas in people with disabilities in Taiwan. Results revealed that the disability population, institutional service beds and occupied service beds were significantly increased in the study. However, the institutional beds per 1000 disabled population and occupancy rate were not statistical difference in the past years. The geographic

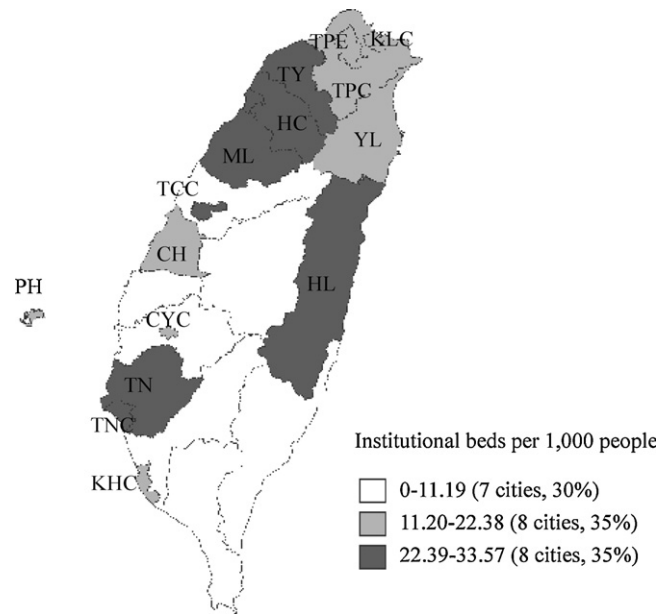


Fig. 1. Disability institutional beds in 23 geographic areas (beds per 1000 people).

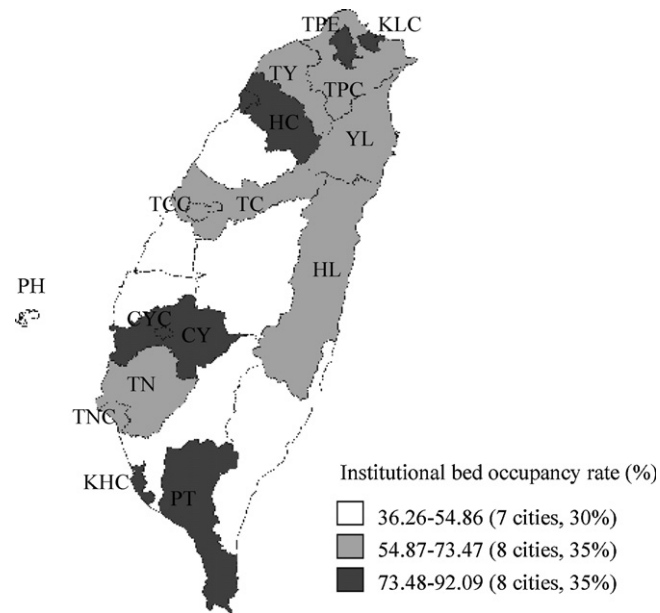


Fig. 2. Disability institutional occupancy rate in 23 geographic areas.

Table 3
Trend tests of disability institutional beds and occupancy rate by year.

Variable	Year									Curve test	
	2002	2003	2004	2005	2006	2007	2008	2009	R^2	p -Value	
Disability number	831,266	861,030	908,719	937,944	981,015	1,020,760	1,040,585	1,071,073	0.993	<0.001	
Institutional beds	16,664	18,981	20,036	20,095	20,080	20,705	21,958	22,990	0.885	=0.001	
Institutional beds per 1000 disabled	20.05	22.04	22.05	21.42	20.47	20.28	21.1	21.46	0.002	=0.923	
Occupied beds	12,611	14,540	15,582	15,905	16,370	17,002	17,457	17,918	0.917	<0.001	
Occupancy rate	75.68	76.6	77.77	79.15	81.52	82.12	79.5	77.94	0.352	=0.121	

distribution of disability welfare resources were still uneven, the disparity of available institutional beds per 1000 disability population were more than 30 folds of highest and lowest rate areas. Many areas such as Pingtung County, Taitung County, Kaohsiung County, Chiayi County and Yunlin County were less than 10 institutional service beds per 1000 disability population. The remote islands, Kinmen County and Pingtung County were also poor in disability service beds in society, however, their occupancy rates were not quite different. Another island – Lienchiang County do not have disability institution there, the disabled people are always residing in Taiwan main island.

The institutional care still plays a vital role in disability services in Taiwan. Many studies have indicated that the disabled people who living in institutions or communities are more inclined to take unhealthy risks (Lin, Lin, Lin, Chang, et al., 2010; Yen & Lin, 2010), poorer health status (Hsu et al., 2009; Lin, Lin, Chen, et al., 2010; Lin, Lin, Lin, Chang, et al., 2010; Lin, Lin, Lin, Hsu, et al., 2010; Yen, Lin, Loh, Shi, & Shu, 2009), met more healthcare barriers (Lin, Lin, Hsu, et al., 2011; Lin, Lin, Yen, Loh, & Chwo, 2009; Lin, Loh, Choi, et al., 2007; Lin, Loh, Yen, et al., 2007; Lin, Wu, & Lee, 2004) and consumed more medical cost (Hung, Lin, Wu, & Lin, 2011; Lai, Hung, Lin, Chien, & Lin, 2011; Lin, Lee, Lin, et al., 2011; Lin, Hung, Lin, & Lai, 2011) than the general population. In order to protect and maintain quality of care in disability institutions, beyond health care, the social inclusion of these people requires labor, home, leisure, and reconstruction of the social network (Guljor et al., 2007). Furthermore, we suggest the disability institutions can adopted the concept developed by Palsbo, Mastal, and O'Donnell (2006) suggested to focus on following activities: comprehensive assessment; self-directed, person-centered planning; health visit support; centralized medical-social record; community resource engagement; and constant communication, to improve health and function in people with disabilities.

References

- Allen, D. (1989). The effects of deinstitutionalization on people with mental handicaps: A review. *Mental Handicap Research*, 2, 18–37.
- Baker, P. A. (2007). Individual and service factors affecting deinstitutionalization and community use of people with intellectual disabilities. *Journal of Applied Research in Intellectual Disabilities*, 20, 105–109.
- Beadle-Brown, J., Mansell, J., & Kozma, A. (2007). Deinstitutionalization in intellectual disabilities. *Current Opinion in Psychiatry*, 20, 437–442.
- Braddock, D., Hemp, R., & Rizzolo, M. C. (2004). State of the states in developmental disabilities: 2004. *Mental Retardation*, 42, 356–370.
- Coucounanis, K., Lakin, K. C., Prouty, R., & Webster, A. (2006). Reductions continue in average daily populations of large state facilities: nearly 70% decrease between 1980 and 2005. *Mental Retardation*, 44, 235–238.
- Fakhoury, W., & Priebe, S. (2002). The process of deinstitutionalization: An international overview. *Current Opinion in Psychiatry*, 15, 187–192.
- Guljor, A. P., Pinheiro, R., Silva, A., Robaina, G., de Souza, J., Teixeira, A. C., et al. (2007). Deinstitutionalization: The sociodemographic profile of institutionalized psychiatric population inpatients of a Brazilian city. *Epidemiology*, 18, S101.
- Hsu, S. W., Lin, Y. W., Chwo, M. J., Huang, H. C., Yen, C. F., Lin, L. P., et al. (2009). Emergency department utilization and determinants of use by 0–6-year-old children with disabilities in Taipei. *Research in Developmental Disabilities*, 30, 774–781.
- Hung, W. J., Lin, L. P., Wu, C. L., & Lin, J. D. (2011). Cost of hospitalization and length of stay in people with Down syndrome: Evidence from a national hospital discharge claims database. *Research in Developmental Disabilities*, 32, 1709–1713.
- Lai, C. I., Hung, W. J., Lin, L. P., Chien, W. C., & Lin, J. D. (2011). A retrospective population-based data analyses of inpatient care use and medical expenditure in people with intellectual disability co-occurring schizophrenia. *Research in Developmental Disabilities*, 32, 1126–1131.
- Lakin, K. C., Prouty, R., & Coucounanis, K. (2006). Twenty-year retrospective on proposals to eliminate the “institutional bias” in Medicaid for persons with ID/DD. *Mental Retardation*, 44, 450–454.
- Lin, J. D., & Lin, L. P. (2009). Governmental disability welfare expenditure and national economic growth from 1991 to 2006 in Taiwan. *Research in Developmental Disabilities*, 30, 481–485.
- Lin, J. D., Hung, W. J., Lin, L. P., & Lai, C. I. (2011). Utilization and expenditure of hospital admission in patients with autism spectrum disorder: National health insurance claims database analysis. *Research in Autism Spectrum Disorders*, 5, 1138–1142.
- Lin, L. P., Lee, J. T., Lin, F. G., Lin, P. Y., Tang, C. C., Chu, C. M., et al. (2011). Disability and hospital care expenses among national health insurance beneficiaries: Analyses of population-based data in Taiwan. *Research in Developmental Disabilities*, 32, 1589–1595.
- Lin, J. D., Lin, P. Y., Chen, L. M., Fang, W. H., Lin, L. P., & Loh, C. H. (2010). Serum glutamic oxaloacetic transaminase (GOT) and glutamic pyruvic transaminase (GPT) levels in children and adolescents with intellectual disabilities. *Research in Developmental Disabilities*, 31, 172–177.
- Lin, L. P., Lin, P. Y., Hsu, S. W., Loh, C. H., Lin, J. D., Lai, C. I., et al. (2011). Caregiver perception of reproductive health recognition and services for women with intellectual disabilities who are caring in welfare institutions. *BMC Public Health*, 11, 59.
- Lin, J. D., Lin, P. Y., Lin, L. P., Chang, Y. Y., Wu, S. R., & Wu, J. L. (2010). Physical activity and its determinants among adolescents with intellectual disabilities. *Research in Developmental Disabilities*, 31, 263–269.
- Lin, J. D., Lin, P. Y., Lin, L. P., Hsu, S. W., Loh, C. H., Yen, C. F., et al. (2010). Prevalence and associated risk factors of anemia in children and adolescents with intellectual disabilities. *Research in Developmental Disabilities*, 31, 25–32.
- Lin, J. D., Lin, Y. W., Yen, C. F., Loh, C. H., & Chwo, M. J. (2009). Received understanding and satisfaction of national health insurance premium subsidy scheme by families of children with disabilities: A census study in Taipei City. *Research in Developmental Disabilities*, 30, 275–283.
- Lin, J. D., Loh, C. H., Choi, I. C., Yen, C. F., Hsu, S. W., Wu, J. L., et al. (2007). High outpatient visits among people with intellectual disabilities caring in a disability institution in Taipei: A 4-year survey. *Research in Developmental Disabilities*, 28, 84–93.
- Lin, J. D., Loh, C. H., Yen, C. F., Li, C. W., Chwo, M. J., & Wu, J. L. (2007). Medical care services for people with intellectual disabilities living in the general community: A cross-sectional survey of inpatient care utilization in Taiwan, 2001. *Disability & Rehabilitation*, 29, 1411–1416.
- Lin, J. D., Wu, J. L., & Lee, P. N. (2004). Utilization of inpatient care and its determinants among persons with intellectual disabilities in day care centres in Taiwan. *Journal of Intellectual Disability Research*, 48, 655–662.
- Lin, J. D., Yen, C. F., Loh, C. H., & Chang, C. L. (2005). Disability welfare services in institutions: Resources distribution and utilization in Taiwan. *Journal of Disability Research (Taiwan)*, 3, 256–265.
- Mansell, J. (2006). Deinstitutionalisation and community living: Progress problems and priorities. *Journal of Intellectual & Developmental Disability*, 31, 65–76.
- MOI. (2011a). The conditions of welfare services institutions for the disabled, 2002–2009. Statistics Yearbook of the Interior, Ministry of the Interior (MOI), Republic of China. <http://sowf.moi.gov.tw/stat/year/y04-20.xls>. Statistics Yearbook of the Interior, Ministry of the Interior (MOI), Republic of China.
- MOI. (2011b). The disabled population by age and grade, 2002–2009. Statistics Yearbook of the Interior, Ministry of the Interior (MOI), Republic of China. <http://sowf.moi.gov.tw/stat/year/y04-18.xls>.
- MOI. (2011c). Population by age, 2002–2009. Statistics Yearbook of the Interior, Ministry of the Interior (MOI), Republic of China. <http://sowf.moi.gov.tw/stat/year/y02-01.xls>.
- McCausland, M. P. (1987). Deinstitutionalization of the mentally ill: Oversimplification of complex issues. *Advances in Nursing Science*, 9, 24–33.
- Palsbo, S. E., & Mastal, M. F. (2006). Disability care coordination organizations – The experience of Medicaid managed care programs for people with disabilities, Center for Health Care Strategies Inc.

- Palsbo, S. E., Mastal, M. F., & O'Donnell, L. T. (2006). Disability care coordination organizations: Improving health and function in people with disabilities. *Lippincott's Case Management*, 11, 255–264.
- Ryu, Y., Mizuno, M., Sakuma, K., Munakata, S., Takebayashi, T., Murakami, M., et al. (2006). Deinstitutionalization of long-stay patients with schizophrenia: The 2-year social and clinical outcome of a comprehensive intervention program in Japan. *Australian & New Zealand Journal of Psychiatry*, 40, 462–470.
- Talbott, J. A. (2004). Deinstitutionalization: Avoiding the diseases of the past. *Psychiatric Services*, 55, 1112–1115.
- The Taiwan Physically and Mentally Disabled Citizens Protection Act (1997). The whole amended text of 75 articles promulgated by president order Hua-Tsung-Yi-Tzu No. 8600097810, April 23, 1997.
- Yen, C. F., & Lin, J. D. (2010). Factors for healthy food or less-healthy food intake among Taiwanese adolescents with intellectual disabilities. *Research in Developmental Disabilities*, 31, 203–211.
- Yen, C. F., Lin, J. D., Loh, C. H., Shi, L., & Hsu, S. W. (2009). Determinants of prescription drug use by adolescents with intellectual disabilities in Taiwan. *Research in Developmental Disabilities*, 30, 1354–1366.
- Yen, C. F., Lin, J. D., Wu, J. L., & Kang, S. W. (2009). Institutional care for people with disabilities in Taiwan: A national report between 2002 and 2007. *Research in Developmental Disabilities*, 30, 323–329.