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High outpatient visits among people with intellectual disabilities caring in a disability institution in Taipei: A 4-year survey

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Abstract

Few studies reported in the literature have addressed the long-term trend of the use of medical care for people with intellectual disabilities (ID) in institutions. The subject cohort in this study was made of 168 individuals with ID in a public residential facility from 1999 to 2002 in Taipei, Taiwan. The average age of participants was 19.3 years, and their average stay in an institution was 6.6 years. The average annual outpatient visit of the study participants was 18.2 in the previous 4 years. It was found that they had more medical visits than the general population. Nearly 20.8–34.5% (average 29.0%) of the participants utilized more than 25 visits annually which was defined as high outpatient visit users. This group of high outpatient users consumed more than half of the total annual outpatient care visits in the past 4 years. In the full model of Generalized Estimating Equations to compare the high and non-high outpatient users, the factor of individuals with ID dwelling in the institution were more likely to be high outpatient care users than individuals who were only accepting institutional day care services (OR = 6.29, 95% CI = 1.35–29.30). The present study provides general information of high outpatient utilization and its determinants of people with ID and provides evidence for medical care decision makers dealing with policy development for people with ID care in institutions.

Keywords: Intellectual disability; Institution; Outpatient visit; Health policy

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1. Introduction

People with intellectual disabilities (ID) are more prone than the general population to particular health problems (Beange, McElduff, & Baker, 1995; Evenhuis, Henderson, Beange, Lennox, & Chicoine, 2001; Lennox & Kerr, 1997; Tyler & Bourguet, 1997; Frid, Anneren, Rasmussen, Sundelin, & Drott, 2002; Lin, Yen, & Wu, 2005), they have higher rates of utilization of medical care services (Lin, Wu, & Lee, 2003, 2004; Lin et al., 2005) and higher levels of medical costs on these services (Meerding, Bonneux, Polder, Koopmanschap, & van der Maas, 1998). Even so, they are still more likely to receive inappropriate and inadequate treatment, or be denied medical care altogether (US Public Health Services, 2002).

Traditionally, large public residential institutions have been society's primary service resource for persons with serious ID (Nelson & Crocker, 1978). Physicians specializing in ID catered to the medical needs of people living in institutions (Aspray, Francis, Tyrer, & Quilliam, 1999). However, these institutional medical staff have been largely isolated form their physician peers historically, and their patients have not had access to medical care equivalent to that available in the community (Nelson & Crocker, 1978). This situation has been improved recently. However, improvement in the needs for practical guidelines and resources, increased staffing and training, and policy-level reduction of obstacles to improve quality of care are still required (Botsford, 2004). Therefore, the closure of large residential institutions with enhanced community services for people with ID has been a common policy in most of western countries (Aspray et al., 1999; Braddock, Hemp, & Rizzolo, 2004; Emerson, 2004).

In Taiwan, the concept of community services for people with ID is on the crossroad, but institutionalized care still dominates the development of services for people with ID. To improve quality of medical care for people with ID living in institutions, the profile of medical care utilization is the basis for evaluating their expressed medical care needs. In the past, many studies have focused on the cross-sectional survey on medical care utilization for people with ID (Frid et al., 2002; Lin et al., 2003, 2004, 2005). Nonetheless, few studies have addressed the longitudinal trend of medical services for people with ID residing in institutions. The long-term trend of medical care utilization would provide valuable information for decision makers involved in healthcare services for people with ID. The aims of the present study were to collect information on long-term medical care utilization and its determinants on a large residential facility caring for people with ID in Taipei, Taiwan.

2. Methods

The study was conducted in a public residential facility in Taipei, Taiwan, which served 211 people with ID who were primarily in the severe or profound range, with multiple disabilities (ID accompanied with other disabilities). The subject cohort was made up of 168 persons with ID who had resided in this institution from 1999 to 2002 (4 years), dwelling (24 h) or attending day care at the institution. The institution has a specific medical care center and skilled nurses management model. The medical care procedure for people with ID in this institution was similar to the general population, requiring the ID individuals to hold a Taiwanese National Insurance Card to register in the clinic. The main difference was that no co-payment was needed for institutional clinic population. The institutional hospital provided seven different outpatient departments (OPD) per week in the year 1999 and 2000, and six OPD in 2001 and 2002 (Table 1). The data of medical care history of people with ID in the institution were stored in the medical center managed by the chief of the institutional nursing department. After

Table 1
Outpatient departments in the study institution from the year 1999 to 2002

Year	Outpatient category
1999	Pediatric, dental, dermatologic, neurologic, psychiatry, rehabilitation, ear–nose–throat, ophthalmology
2000	Pediatric, dental, dermatologic, neurologic, psychiatry, rehabilitation, ear–nose–throat, ophthalmology
2001	Pediatric, dental, dermatologic, neurologic, psychiatry, rehabilitation, ear–nose–throat
2002	Pediatric, dental, dermatologic, neurologic, psychiatry, rehabilitation, ear–nose–throat

proving institutional authority for the confidential protection of medical records for people with ID, the second author recorded all 168 subjects' information from their medical charts. The information included outpatient care utilization, demographic data such as age, gender, disability status, and body mass index, length of caring in the institution and household economic information which may relate to the medical care utilization. The data were entered into a database and analyzed using SPSS 11.0 and STATA 8.0 software. Analyses included frequency distributions and percentages for the demographic data and outpatient care utilization. We used Generalized Estimating Equation (GEE) to compare the relationship of demographic profile and the consecutive 4 years outpatient care utilization retrospectively.

3. Results

The average age of subjects was 19.3 years old in 1999 (the time of the first year in which data were taken); female were older (mean = 19.86 years, S.D. = 6.72) than male (mean = 18.97 years, S.D. = 6.63), but the discrepency was not significantly different. Selected indices of demographic characteristics for the sample with ID are summarized in Tables 2 and 3. The average height of people with ID was 149.78 cm (S.D. = 12.44) and weight was 39.22 kg (S.D. = 13.06). Males (mean = 152.91 cm, S.D. = 12.63) were taller than females (mean = 145.04, S.D. = 10.62). The average length of staying in institution among the samples was 6.64 years (S.D. = 5.60). 32.1% of the subjects were institutionalized for more than 10 years. Nearly 60% of the subjects had multiple disabilities which included intellectual disability accompanied with other disabilities. The level of disability showed that 76.2% of the subjects had profound disabilities, 20.2% had severe disabilities and the remaining 3.6% had medium disabilities. Over one-half of the subjects evinced cerebral palsy. With regard to household economic status, more than 30% of the subjects came from low income families with their total families' annual income below 2.5 times the average annual income of the general Taiwan population. Nearly 89% of the samples were residing in the institutions and 12% were accepting day care services, commuting between their families and the institution. Generally speaking, the demographic characteristics (gender, age, disability status and level, household economic status, caring style and staying years in the institution, accompanied with cerebral palsy and physical weight) between the male and female were not statistically different except for height (males were taller than females).

Table 4 summarizes the outpatient care utilization of the study sample. Analyses of average annual outpatient care visits, drawn from their previous medical care chart, show 15.6–21.2 visits in the year 1999–2002. The average annual outpatient care utilization in the previous 4 years was 18.2 visits. The year 2001 was significantly higher than other years in the annual outpatient visits. Pediatrics, neurological and rehabilitative clinics were the three most common types of medical care sought by people with ID in the institution. Pediatric medical care was used most because most of the study sample tended to be of preadolescent age as they enrolled in the institution. In

Table 2
Demographic characteristics of people with ID[a]

Variable	Number	Percent
Gender		
Male	105	62.5
Female	63	37.5
Age (years old)	19.30 ± 6.66	
0–14	42	25.0
15–19	56	33.3
20–29	57	33.9
30–39	12	7.1
≥40	1	0.6
Disability status		
ID	69	41.1
Multiple	99	58.9
Disability level		
Medium	6	3.6
Severe	34	20.2
Profound	128	76.2
Height (cm) (mean ± S.D.)	149.78 ± 12.44	
Weight (kg) (mean ± S.D.)	39.22 ± 13.06	
Caring style		
Dweller	149	88.7
Day care	19	11.3
Staying years in institution	6.64 ± 5.60	
0–4	93	55.4
5–9	21	12.5
10–14	32	19.0
15–19	22	13.1
Low income family		
No	117	69.6
Yes	51	30.4
Cerebral palsy		
No	78	46.4
Yes	90	53.6

[a] Based on the subjects' demographic data in the year 1999.

the annual outpatient visits from 1999 to 2002, there were 20.8–34.5% (average 29.0%) of the persons with ID utilized over 25 visits defined as high outpatient care users defined by the Bureau of the National Health Insurance in Taiwan (2004). These 29% high outpatient care users consumed more than half of the total outpatient care visits over 4 years.

Outpatient visits of four successive years were correlated since repeated measures from the same subjects were more alike than measurements from different subjects. These successive data need to be treated as fixed samples statistically. Therefore, we used generalized estimating equations to compare the differences and to identify determinants for high and low outpatient care users. Table 5 summarizes the differences in annual outpatient visits on different years. For 2000, the average annual visits of 4 years were slightly higher than the reference year of

Table 3
Demographic characteristics of people with ID by gender[a]

Variable	Male		Female		p-Value[b]
	Number	Percent	Number	Percent	
Age (years)[c]		18.97 ± 6.63		19.86 ± 6.72	0.407
≤18	60	57.1	29	46.0	0.162
>18	45	42.9	34	54.0	
Disability status					0.181
ID	39	37.1	30	47.6	
Multiple[d]	66	62.9	33	52.4	
Disability level					0.67
Medium	4	3.8	2	3.2	
Severe	19	18.1	15	23.8	
Profound	82	78.1	46	73.0	
Height (cm)[c]	71	152.91 ± 12.63	47	145.04 ± 10.62	0.001
Weight (kg)[c]	104	39.84 ± 12.71	62	38.17 ± 13.65	0.425
Caring style					0.95
Dweller	93	88.6	56	88.9	
Day care	12	11.4	7	11.1	
Staying years in institution[c]		6.39 ± 5.76		7.06 ± 5.33	0.457
0–4	61	58.1	32	50.8	0.175
5–9	9	8.6	12	19.0	
10–14	19	18.1	13	20.6	
15–19	16	15.2	6	9.5	
Low income family					0.762
No	74	70.5	43	68.3	
Yes	31	29.5	20	31.7	
Cerebral palsy					0.842
No	49	46.7	29	46.0	
Yes	56	53.3	34	54.0	

[a] Based on data of the year 1999.
[b] Chi-square test or t-test.
[c] Mean ± S.D.
[d] ID with other disabilities.

1999. The year 2001 and 2002 were not significantly different in annual average outpatient visits in 1999.

For the determinants of high outpatient visits, see Table 6. The demographic factors of family economic status and caring style in the institution were related to the high or non-high outpatient care utilization in GEEs' single variable model. Those ID individuals from low income families were 1.76 times more likely (95% CI = 1.00–3.10) to become high outpatient care users than individuals with ID who were not. The factor of individuals with ID dwelling in institution were 6.59 times more likely (95% CI = 1.46–29.68) to become high outpatient care users than individuals with ID who were only utilizing day care services in institution. The remaining factors such as gender, age, disability type and level, accompanied with cerebral palsy, and BMI value were not significantly correlated to whether they were high outpatient care users or not. In the full model of GEEs which evaluated the real factors will determine the high outpatient care

Table 4
Characteristics of outpatient care visits in year 1999–2002

Variable	1999 Number (%)	2000 Number (%)	2001 Number (%)	2002 Number (%)	Total number (%)
Average visits[a]	15.6 ± 11.7	17.7 ± 12.8	21.2 ± 13.4	20.4 ± 12.7	18.2 ± 10.9
Clinical system					
Pediatrics	693(25.5)	851(28.7)	962(27.0)	1196(34.4)	3702(29.3)
Ear, nose and throat	192(7.1)	173(5.8)	384(10.8)	213(6.1)	962(7.6)
Dentistry	86(3.2)	45(1.5)	31(0.9)	20(0.6)	182(1.4)
Neurology	637(23.4)	724(24.4)	861(24.2)	698(20.1)	2920(23.1)
Dermatology	312(11.5)	402(13.5)	379(0.7)	454(13.1)	1547(12.2)
Psychiatry	283(10.4)	251(8.5)	354(10.0)	313(9.0)	1201(9.5)
Rehabilitation	482(17.7)	484(16.3)	586(6.5)	576(16.6)	2128(16.8)
Ophthalmology[b]	34(1.3)	39(1.3)	–	–	–
Annual visits by the number of persons					
<25 visits	133(79.2)	120(71.4)	110(65.5)	115(68.5)	478 (71.0)
≥25 visits	35(20.8)	48(28.6)	58(34.5)	53(31.5)	194(29.0)
Annual visits[c]	2719	2969	3567	3470	12642
<25 visits	1490(54.8)	1324(44.6)	1452(40.5)	1551(44.7)	5817(45.8)
≥25 visits	1229(45.2)	1645(55.4)	2115(59.5)	1919(55.3)	6895(54.2)

[a] Mean ± standard deviation (S.D.).
[b] No ophthalmologic clinic services in year 2001 and 2002.
[c] Total annual visits.

Table 5
High (≥25 visits) and non-high (<25 visits) outpatient utilization in different year by generalized estimating equations (GEEs)

Year	<25 visits/≥25 visits Relative risk	S.E.	Z	$P>\|z\|$
4 years	1.21	0.06	3.61	<0.001
1999	1.00		Reference group	
2000	1.52	0.26	2.45	0.014
2001	2.00	0.34	4.14	<0.001
2002	1.75	0.30	3.31	0.001

users by controlling the interaction of factors. Table 7 shows that the factor of caring style in institution was the only variable that was helpful in significantly predicting high or low outpatient care users. Individuals with ID dwelling in institution were more likely to be high outpatient care users than do individuals who were only accepting day care services in institution (OR = 6.29, 95% CI = 1.35–29.30).

4. Discussions

The survey design involved the completion of a 4-year medical care utilization record in a Taiwanese public residential facility. The profile of medical care is one useful indicator when determining medical care needs for people with ID (Lin et al., 2003). Other indicators such as morbidity, specialty of the providers, and regulatory policies might also reflect real medical

Table 6
Factors related to high (≥25 visits) and non-high (<25 visits) outpatient utilization in generalized estimating equations (GEEs)—single variable model

Variable	Number	<25 visits/≥25 visits		*p*-Value
		Odd ratio	95% CI	
Gender				
Female	105	1.00		
Male	63	0.67	0.39–1.16	0.15
Low income family				
No	117	1.00		
Yes	51	1.76	1.00–3.10	0.05
Dwelling in institution				
No	19	1.00		
Yes	149	6.59	1.46–29.68	0.01
Disability type				
ID	69	1.00		
ID + multiple	99	0.88	0.51–1.52	0.65
Disability level				
Medium	6	1.00		
Severe	34	0.76	0.38–1.53	0.45
Profound	128	0.46	0.08–2.68	0.39
Cerebral palsy				
No	78	1.00		
Yes	90	1.23	0.71–2.12	0.46
Age (years)				
≤18	75	1.00		
>18	93	0.92	0.60–1.39	0.69
Staying years in institution				
0–4	94	1.00		
5–9	21	1.46	0.91–2.35	0.12
10–14	35	1.13	0.68–1.87	0.64
15–19	18	1.61	0.98–2.64	0.06
Body mass index[a]				
Standard	45	1.00		
Obese	19	0.84	0.46–1.56	0.53
Skinny	59	1.35	1.00–1.85	0.07

[a] Body mass index (Department of Health, 2004): (1) age ≤19 years calculated by their percentile, skinny: BMI ≤ 15th, standard: 15th < BMI < 85th, overweight: 85th ≤ BMI ≤ 95th, obese: BMI ≤ 95th and (2) age >19 years, skinny: BMI < 18.5, standard: 18.5 ≤ BMI < 24, overweight: 24 ≤ BMI < 27, obese: BMI > 27.

needs of this group. Longitudinal medical care utilization is a good scientific evidence for the development of medical care policies for people with ID. In the past, the unavailability of medical professionals employed in disability institution has hindered the quality of healthcare for persons with ID living in or visiting institutions. The links between social welfare and medical care has been lost due to different roles and perspectives in Taiwan (Lin et al., 2003). The effective alternative solution for shortage of medical care professionals in a disability institution is affiliated with medical care organizations. Disability institutions affiliated with a

Table 7
Factors related to high (≥25 visits) and non-high (<25 visits) outpatient care utilization in generalized estimating equations (GEEs)—full model

Variable	Number	<25 visits/≥25 visits		*p*-Value
		Odd ratio	95% CI	
Gender				
Female	105	1.00		
Male	63	0.71	0.39–1.27	0.25
Low income family				
No	117	1.00		
Yes	51	1.67	0.90–3.17	0.10
Dwelling in institution				
No	19	1.00		
Yes	149	6.28	1.35–29.30	0.019
Disability type				
ID	69	1.00		
ID + Multiple	99	0.70	0.36–1.40	0.30
Disability level				
Medium	6	1.00		
Severe	34	0.72	0.34–1.50	0.38
Profound	128	0.55	0.08–3.59	0.53
Cerebral palsy				
No	78	1.00		
Yes	90	1.51	0.76–2.99	0.46
Age (years)				
≤18	75	1.00		
>18	93	0.91	0.57–1.45	0.69
Staying years in institution				
0–4	94	1.00		
5–9	21	1.28	0.79–2.10	1.00
10–14	35	1.16	0.68–1.99	0.58
15–19	18	1.48	0.87–2.50	0.15
Body mass index[a]				
Standard	45	1.00		
Obese	19	0.85	0.44–1.64	0.64
Skinny	59	1.31	0.95–1.82	0.10

[a] Body mass index (DOH 2004): (1) age ≤19 years calculated by their percentile, skinny: BMI ≤ 15th; standard: 15th<BMI<85th, overweight: 85th ≤ BMI ≤ 95th, obese: BMI ≥ 95th and (2) age >19 years, skinny: BMI < 18.5, standard: 18.5 ≤ BMI < 24, overweight: 24 ≤ ≤MI < 27, obese: BMI > 27.

hospital would assure better care for persons with ID while increasing accessibility and availability of medical care (Choi, 2004).

The present study has evaluated an institution which is affiliated with a teaching hospital to assess appropriate medical care for persons with ID. This cooperative model between a hospital and an institution is supported by many agencies including the Taiwan Bureau of National Health Insurance, Taipei Municipal Government and local medical associations. The main purposes of this scheme were to improve accessibility and availability of medical care services for people with ID in institutions.

Table 8
Number of annual outpatient care visits and types among different studies in Taiwan

Studies	Year	Annual visits	Top five clinical systems (%)
The present study	1999–2002	18.18	Pediatrics (29.3), neurological (23.1), rehabilitation (16.8), dermatological (12.2), psychiatric (9.5)
Lin et al. (2003)	1996	26.26	Pediatrics (32), ear–nose–throat (13.7), rehabilitation (11.4), neurological (10.1), internal medicine (9.3)
MoI (2000)	1999	17.70	Internal medicine (61.27), psychiatric (6.1), neurological (4.86), ear–nose–throat (4.15)
Lin et al. (2001)	2001	16.28	Internal medicine (24.4), psychiatric (16.7), dental (13.8), ear–nose–throat (13.6), neurological (12.1)

The average annual outpatient care visits was 18.2 in the previous 4 years. We found that ID patients were more likely to have poorer health status and consume more medical resources than the general population (Department of Health, 2002). Compared to other studies in Taiwan, these results were similar to those of Lin et al. (2001) and MoI (2000). The annual outpatient visits they report were 16.28 and 17.7. The result of Lin et al. (2003) were from a survey of 30 institutions. The average annual outpatient care visits in this third study was 26.26 (Table 8). The possible explanations were that the study sample's age in Lin et al. (2003) was younger (13.7 years). These authors calculated the annual outpatient care visits based on 1-month data. Their data may be an overestimation of the value of outpatient care visits. With regard to the clinical systems, the present study was similar to other studies (Lin et al., 2003; MoI, 2000) which found that pediatrics, neurological and rehabilitation were the most used clinical professions. The dermatologic clinic was also frequently used. We interpret these data to mean that institutional care needs should be monitored closely for the prevalence of skin diseases.

There was an average of 29.0% of individuals with ID in the previous 4 years who utilized over 25 annual outpatient visits, defined as high medical care users. This figure is more than the general population where 17.8–20.5% were high outpatient care users (Lai, 1999; Saei & Huang, 2002). The high outpatient care users in the present study consumed 54.2% of the total outpatient care visits. This figure is similar to Saei and Huang (2002) who conducted the analysis of the general population. The higher outpatient care users consumed 54.09% of total outpatient care visits. Compared to a U.S. study, only 8% of patients had in-residence physician contact over the past 12 months (Janicki et al., 2002). These data suggest that the medical care system in different countries may affect the medical care utilization of persons with ID in a community or institution.

Individuals with ID dwelling in an institution were significantly associated with high outpatient care visits. Many possibilities can explain this factor including the fact that those individuals dwelling in institutions have a more severe level of disabilities and may consume more medical resources than the day care users. Secondly, people with ID residing in the institution have been monitored over a long-term (they were 24 h residence per day). Therefore, their health problems can be managed more efficiently and effectively than the day care users in the institution.

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