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Original Article

Analysis of outpatient medical services for correctional institution's inmates entitled to national health insurance: A prison in Taiwan



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Background: To formulate better future policies, this study aims to understand the outpatient services provided in a prison in Southern Taiwan by the contracted hospital in two phases.

Methods: Data were analyzed through the outpatient medical services performed by the contracted hospitals in prison in two phases (2013–2015 and 2016–2018). SPSS 20.0 software was used to analyze data such as age, medical fees, department, outpatient visits, average number of visits per patient, and common diseases.

Results: The average age of the treated inmates was 49.34 and 47.04 years in the first and second phases, respectively. Most patients belong in the age group of 41–50 years. The number of medical visits per person increased from 15.6 to 20.6 visits. The average medical fee per visit increased from NTD 748 to NTD 775, and the average days of medication per visit decreased from 14 to 13 days. Commonly visited were family medicine, general medicine, orthopedics, and psychiatry departments. Disease of the skin and subcutaneous tissue was the first common disease in both phases, and hypertension was the most common disease.

Conclusion: The number of medical visits and the average medical fee increased. The medical cost of inmates is higher than the generally insured individuals. If environmental conditions in the correctional facility are improved, the consumption of medical resources will be reduced. There should be a complete therapy and medical treatment plan for mentally ill inmates for a successful return to the society after serving time.

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Introduction

In 1995, the National Health Insurance Administration (NHIA) was implemented in Taiwan in 1995 to eliminate financial barriers in receiving medical treatment, further protecting the physical and mental health of all its citizens. However, when the national health insurance was initially introduced (first-generation health insurance), soldiers and inmates (those who are serving time or in rehabilitative disposition execution in prison or in detention institutions and those disciplined for more than 2 months are collectively called as "inmates") were excluded.^{1,2} The National Health Insurance Act (the "second-generation health insurance") that included inmates for coverage was launched on January 1, 2013, to improve the medical care for inmates in correctional institutions and to implement the constitutional requirement of protecting the health of the people. A health department was established in a correctional institution to manage the health and treatment of inmates. Physicians are contracted to perform outpatient services in correctional institutions. When an inmate has a disease or injury or is giving birth, he/she should receive treatment in the correctional institution first. If the inmate is seriously ill or in critical condition, he/she will be transferred to a hospital for guarded and controlled treatment.³

The NHIA coordinates with medical facilities near the correctional institutions in providing outpatient services, arranging for medical supplies, and performing guarded medical services in accordance with the "Medical Service Program for Inmates of Correctional Institutions covered by the NHIA."³ To ensure equal coverage by the same insurance policy, inmates who receive outpatient services in the correctional institution and guarded and controlled medical treatment will pay the same deductible amount (and registration fee) as the generally insured individuals. Including inmates in the national health insurance policy and the realization of "good health in prisons" are indeed the major achievements in health and prison administration in Taiwan. A positive result is indeed presented.⁴

The NHIA and Ministry of Health and Welfare cooperated with 51 correctional institutions nationwide and 100 nearby national health insurance contracted medical institutions in 2015 to improve availability of medical services and medical quality. However, most inmates are not satisfied with the received medical services.^{5,6} In addition, many nations have paid more and more attention to the medical treatment of inmate patients in recent years. Many studies suggest that inmates should receive the same medical treatment and care as the general public.^{7,8} The correctional institutions in Japan give great importance to medical treatment, with eight correctional medical institutions (medical prison), which were independent organizations engaged in prison medical operations, set up nationwide.⁹ Prison medical-related issues are also addressed in the United States, and each prison has signed a contract with a health care institution to provide medical service to the inmates, or each prison has signed contracts with hospitals and other medical institutions for guarded and controlled outpatient and hospitalization services. The inmates must

pay a part of the medical fees, and the rest will be handled by the judicial authority. Therefore, most prisons will sign a contract with a medical insurance agency such as the Correctional Medical Services.¹⁰

There are approximately 50,000 inmates in the prisons of Taiwan, and about 10% in each prison receive medical services daily.¹¹ Each inmate makes an average of 18 outpatient visits annually and an average of 15.1 outpatient visits in 2017, which was higher than outpatient visits made by the general public.¹² According to the 2005 statistics, in terms of guarded and controlled medical fees for inmates in correctional institutions nationwide, the deductible of inmates was about NT\$41.3 million, the agency subsidy amount was about NT\$38.17 million, and the Ministry of Justice's subsidy amount was about NT\$20.97 million, representing a positive growth trend compared to that in 2004. The cost of subsidies for intensive care and medicine was about NT\$76.45 million. Therefore, the average annual medical cost of each inmate was about NT\$3304 in 2005.¹³

According to the Additional Articles of the Constitution of the Republic of China and the National Health Insurance Act, all citizens are entitled to the rights and obligations of the national health insurance. Comprehensive related researches^{2, 11, 13-16} reported that the number of outpatient visits made by inmates is higher than that of the general public and the medical fees are indicating a positive growth trend. Inmates become a heavy burden to the society, causing health insurance financial loading after getting release, if they do not receive proper medical care in prison. These are important factors for having inmates included in the national health insurance. Therefore, this study aimed to understand the outpatient services provided in a prison in Taiwan by the contracted hospital in two phases as a reference for the concerned authority in formulating future policies.

Materials and methods

Data sources and research variables

This study was performed with a secondary data analysis. The data source is the statistics of the national health insurance outpatient data of a teaching hospital in Southern Taiwan contracted by a correctional institution. Because inmates in correctional institutions have been covered by national health insurance since 2013, the variable data of this study for analysis were collected from 2013 to 2018, and each medical treatment data was used as the unit of analysis. The medical service plan of the correctional institution undertaken by the hospital was signed for a period of 3 years. The first phase of the plan was from January 1, 2013, to December 31, 2015 and the second phase from January 1, 2016, to December 31, 2018.

Statistical analysis

This study was conducted using a retrospective data analysis. A total of 192,452 observations were included during the data collection period. The study variables mainly

include national health insurance outpatient medical fees and other data such as age, medical department, and disease category. SPSS 20.0 was utilized for data analysis. χ^2 test and variance analysis were used to discuss and compare the medical services performed in the first and second phases. Descriptive statistics were used to analyze the outpatient data of correctional institutions, including outpatient visits by department, average number of visits, common outpatient diseases, and frequency of visits; in addition, category variables were tested using χ^2 test, and $P < 0.05$ was considered statistically significant.

Results

Based on the data of both phases, there were 3180 inmates in correctional institutions in 2015 and 3040 inmates in 2018 who received medical treatment. A total of 78,553 and 113,899 outpatient visits were made in the first and second phase, respectively. Overall, the average age of the treated inmates was 49.34 and 47.04 years in the first and second phase, respectively. Most patients in the first and second phases were mostly in the age group of 41–50 years, accounting for 31.9% and 33.4%, respectively, followed by the age group of 51–60 years (accounting for 26.4% and 23.4%) and the age group of 31–40 years (accounting for 21.5% and 23.0%). Significant differences were determined in the age statistics of outpatient visits between the first and second phases ($\chi^2 = 2428.28$, $P < 0.001$) (Table 1).

In terms of outpatient medical fee statistics, in the first phase, the diagnosis fee accounted for 30.81%; the drug fee, 45.11%; the treatment fee, 16.93%; and the dispensing service fee, 7.15%. In the second phase, the diagnosis fee

accounted for 32.06%; the drug fee, 40.4%; the treatment fee, 21.63%; and the dispensing service fee, 5.91%. The medical fee was 58 million points in the first phase and 88 million points in the second phase, representing an average growth of 50.2%, the fee rate of diagnosis and treatment of which increased. The reasons may be partly attributed to the incentive of health insurance benefits for the hospital and reinforcement of medical diagnosis supply. The number of medical visits per person increased from 15.6 to 20.6 visits; the average medical fee per visit increased from NT\$748 to NT\$775. However, the average days of medication per visit decreased from 14 to 13 days. Significant differences were found in the medical fees statistics between the first phase and second phase ($P < 0.001$) (Table 2).

For the outpatient treatment by department statistics, it mainly focused on five major medical departments that accounted for more than 80% of the medical visits, namely, family medicine (49.0%), general medicine (16.1%), orthopedics (8.8%), psychiatry (8.3%), and general surgery (3.4%) in the first phase and family medicine (46.5%), general medicine (22.2%), orthopedics (7.5%), psychiatry (7.4%), and general surgery (3.6%) in the second phase (Table 3). Second, in terms of the ICD-10 disease classification system statistics, it mainly focused on seven major systems that accounted for more than 80% of the diseases, namely, diseases of the skin and subcutaneous tissue (L00–L99) in the first phase and second phase (16.30% and 17.20%, respectively); diseases of the musculoskeletal system and connective tissue (M00–M99; 10.80% and 15.30%, respectively); diseases of the respiratory system (J00–J99; 12.60% and 14.50%, respectively); diseases of the circulatory system (I00–I99; 16.30% and 13.70%, respectively); diseases of the digestive system (K00–K94; 12.40% and 7.90%,

Table 1 Age statistics of inmates in prison.

Item	Number of inmates in a prison				Number of outpatient visits				P value
	2015 Year	%	2018 Year	%	First phase	%	Second phase	%	
Age									<0.001
<20	0	0.0%	1	0.0%	0	0.0%	379	0.3%	
21–30	301	9.5%	251	8.3%	2137	2.7%	7511	6.6%	
31–40	1170	36.8%	839	27.6%	16,916	21.5%	26,175	23.0%	
41–50	988	31.1%	1092	35.9%	25,055	31.9%	38,029	33.4%	
51–60	545	17.1%	627	20.6%	20,741	26.4%	26,637	23.4%	
61–70	156	4.9%	195	6.4%	10,626	13.5%	11,907	10.5%	
>70	20	0.6%	35	1.2%	3078	3.9%	3261	2.9%	
Total	3180	100%	3040	100%	78,553	100%	113,899	100%	

Table 2 Medical fee statistics of inmates.

Item	First phase	Second phase	P value
Diagnosis fee (point, %)	18,101,083 30.81	28,313,744 32.06	<0.001
Drug fee (point, %)	26,503,610 45.11	35,673,281 40.40	<0.001
Treatment fee (point, %)	9,950,650 16.93	19,098,377 21.63	<0.001
Dispensing service fee (point, %)	4,203,366 7.15	5,219,411 5.91	<0.001
Total of medical fee (point)	58,758,709	88,304,813	<0.001
The number of medical visits per person	15.6	20.6	<0.001
Average medical fee per visit (NTD)	748	775	<0.001
Average days of medication per visit	14	13	<0.001

Table 3 Medical division statistics of inmates.

Departments	First phase		Second phase	
	Cases	%	Cases	%
Family medicine	38,505	49.0%	52,984	46.5%
General medicine	12,646	16.1%	25,335	22.2%
Orthopedics	6940	8.8%	8587	7.5%
Psychiatry	6541	8.3%	8434	7.4%
General surgery	2674	3.4%	4150	3.6%
Gastroenterology	3638	4.6%	3333	2.9%
Metabolism	360	0.5%	2266	2.0%
Chest surgery	30	0.0%	2122	1.9%
Ophthalmology	979	1.2%	1388	1.2%
Otolaryngology	316	0.4%	1278	1.1%
Cardiology	3687	4.7%	868	0.8%
Neurosurgery	31	0.0%	741	0.7%
Chest	632	0.8%	739	0.6%
Emergency medicine	404	0.5%	606	0.5%
Urology	498	0.6%	421	0.4%
Neurology	109	0.1%	178	0.2%
Dermatology	521	0.7%	168	0.1%
Endocrinology	1	0.0%	128	0.1%
Hematology and oncology	35	0.0%	109	0.1%
Obstetrics and gynecology	2	0.0%	39	0.0%
Pediatrics	1	0.0%	14	0.0%
Infectious disease	3	0.0%	11	0.0%
Total	78,553	100.0%	113,899	100.0%

respectively); mental and behavioral disorders (F01–F99; 9.10% and 7.60%, respectively); and symptoms, signs, and abnormal clinical and laboratory findings, not elsewhere classified (R00–R99; 3.10% and 5.00%, respectively) (Table 4). Among them, 110 was found to have the highest

number of medical visits, 8130 visits and 10,372 visits, respectively (Table 5).

Study limitations

The extrapolation and representativeness of the results are limited as the collection of research data is based on only one prison in Southern Taiwan.

Discussion

In this study, the analysis of the difference between the two phases was based on the outpatient medical information of a correctional institution in Taiwan. The age distribution of inmates in 2015 and 2018 was concluded in this study: In the first phase, the inmates mostly belong to the age group 31–40 years and the second phase to the age group 41–50 years. In terms of outpatient visits, inmates in both phases were mostly in the age group of 41–50 years, indicating a significant difference in age ($P < 0.001$). This study concludes that because of the diversified composition of inmates (including inmates, defendants, juveniles, adult observances, and juveniles under observation and corrections) in correctional institutions resulting in a population change, the demography and number of medical visits indicated a significant difference in two separate years.

Second, before inmates were covered by the national health insurance, the correctional institution adopted a public medical system. Due to lacking doctors and medical treatments performed with the consideration of the daily routine management of the prison and detention center, medical services had faced a problem of insufficient or lacking resources for a long time. After having the inmates covered by the national health insurance, many problems related to the outpatient service of public hospitals were

Table 4 Disease system statistics of inmates.

ICD-10-CM	First phase		Second phase	
	Cases	%	Cases	%
Diseases of the skin and subcutaneous tissue (L00–L99)	12,822	16.30%	19,556	17.20%
Diseases of the musculoskeletal system and connective tissue (M00–M99)	8517	10.80%	17,468	15.30%
Diseases of the respiratory system (J00–J99)	9893	12.60%	16,468	14.50%
Diseases of the circulatory system (I00–I99)	12,839	16.30%	15,595	13.70%
Diseases of the digestive system (K00–K94)	9728	12.40%	8990	7.90%
Mental and behavioral disorders (F01–F99)	7185	9.10%	8601	7.60%
Symptoms, signs, and abnormal clinical and laboratory findings (R00–R99)	2432	3.10%	5744	5.00%
Certain infectious and parasitic diseases (A00–B99)	828	1.10%	4645	4.10%
Endocrine, nutritional, and metabolic disease (E00–E90)	3720	4.70%	4505	4.00%
Factors affecting health status and contact with health services (Z00–Z99)	53	0.10%	2925	2.60%
Diseases of the eye and adnexa (H00–H59)	2196	2.80%	2857	2.50%
Diseases of the nervous system and sense organs (G00–G99)	2847	3.60%	2174	1.90%
Injury, poisoning, and certain other consequences of external causes (S00–T88)	2527	3.20%	1566	1.40%
Diseases of the genitourinary system (N00–N99)	1395	1.80%	1485	1.30%
Neoplasms (C00–D49)	939	1.20%	1295	1.10%
Pregnancy, childbirth, and the puerperium (O00–O99)	6	0.00%	4	0.00%
Newborn (perinatal) guidelines (P00–P96)	13	0.00%	12	0.00%
Congenital malformations, deformations, and chromosomal abnormalities (Q00–Q99)	16	0.00%	9	0.00%
External causes of morbidity (V01–Y99)	597	0.80%		0.00%

Table 5 Disease statistics of inmates.

ICD-10-CM		Cases of the first phase	Cases of the second phase
I10	Essential (primary) hypertension	8110	10,372
J069	Acute upper respiratory infection, unspecified	4675	7741
L282	Other prurigo	2913	6069
J00	Acute nasopharyngitis (common cold)	2443	4229
M7500	Adhesive capsulitis of unspecified shoulder	2430	4067
M150	Primary generalized (osteo)arthritis	2137	2975
L02838	Carbuncle of other sites	1705	2973
L0293	Carbuncle, unspecified	1282	2938
F419	Anxiety disorder, unspecified	1281	2795
E119	Type 2 diabetes mellitus without complications	1191	2393
I119	Hypertensive heart disease without heart failure	1168	2047
R21	Rash and other nonspecific skin eruption	916	1613
M545	Low back pain	914	1403
Z0000	Encounter for general adult medical examination	887	1367
M629	Disorder of muscle, unspecified	832	1261
K210	Gastro-esophageal reflux disease with esophagitis	829	1097
M4800	Spinal stenosis, site unspecified	809	1009
B182	Chronic viral hepatitis C	789	993
M6080	Other myositis, unspecified site	755	953
Z1281	Encounter for screening for malignant neoplasm of oral cavity	734	948

significantly improved. While contracting hospitals for medical services, a sufficient number of doctors and additional medical specialists were provided to have a large number of patients treated within a limited time. Therefore, there were many medical consultation systems and processes executed in the first phase that had to be established by the contracted hospitals and the correctional institution. Moreover, because there was insufficient incentive for doctors to perform medical service in the first phase, the medical system and procedures were finally completed in the second phase. Our findings show that the medical treatment received by the inmates in both phases indicated a significant change; in addition, the overall medical fee in the second phase was higher than that of the first phase, so was the number of medical treatments performed.

Furthermore, in terms of classifying medical services by department, this study concludes that both family medicine and internal medicine departments ranked in the first place in both phases and the psychiatry department ranked in the fourth place. It could be because that the prison is densely populated and the composition is complicated; thus, the living cells of inmates and daytime operating factories have a closed and crowded environment where respiratory tract and infectious diseases could easily spread. Therefore, the demand for family medicine and internal medicine is deemed high. Furthermore, there is a large number of substance addicts and intolerance to social norms¹⁷; hence, psychiatric needs are also high, which is similar to the study by Chen et al.¹⁸ In addition, comparing the diseases of the skin with the outpatient services of the general public, a significantly increased frequency of treatment is found in correctional institutions,¹⁹ which may be related to the environmental conditions of correctional institutions. Prurigo, rash, and other nonspecific skin eruption are the most common skin diseases, which could be caused by poor personal hygiene, high population

density in correctional institutions, poorly ventilated jail cells, and heavy sweating, which is identical to the research result by Tai et al.²⁰

Finally, the number of middle-aged and elderly inmates in correctional institutions is rapidly increasing, representing a new challenge to correctional institutions: chronic disease medical treatment.²¹ As stated in this study, the number of visits because of essential (primary) hypertension, type 2 diabetes mellitus, and hypertensive heart disease accounted for 13%, which is consistent with the study by Harzke et al.²² Although the proportion of diseases is different in various studies, chronic diseases are the main concern, which is consistent with the results of this study.

Suggestions

Finally, with the inmates of correctional institutions being covered by the national health insurance, the contracted hospitals and clinics must invest in medical manpower and equipment actively to minimize guarded and controlled medical treatments of inmates and take into account managerial needs of correctional institutions. The rights of inmates to medical treatment have been improved significantly owing to the reform of the national health insurance system, but the demand and utilization of medical services are different from that of the general public. According to the results of this study, suggestions were made as follows¹: the environment in correctional institutions needs to be actively changed to minimize the consumption of medical resources²; the management of inmates with physical and mental illness will become a challenge to the correctional institutions. Suggestions are provided to correctional institutions to provide a more complete therapy and medical treatment plan for mentally ill inmates to help them return to the society after serving their time. The competent

authority or academic research institution should carefully interpret the relevant data and conclusions when referring to the results of this research.

Authors' contributions

YHY initiated the research, collected data, conducted the analysis and wrote the manuscript. LMT and KMC contributed to the design of the study, provided critical reviews of the manuscript and contributed to interpretation of the results.

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Availability of data and materials

Data cannot be made publicly available owing to the fact that the privacy of individual participants cannot be compromised. However, the dataset is available from the corresponding author on reasonable request.

Consent for publication

Not applicable.

Ethical approval

The data collection procedure followed the research ethics principles in humanistic-social science research stipulated by the Tainan Municipal Hospital (Managed by Show Chwan Medical Care Corporation) Research Council.

Declaration of competing interest

The authors have no conflicts of interest relevant to this article.

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