



## Trends in the use of psychotropic drugs in people with intellectual disability in Taiwan: A nationwide outpatient service study, 1997–2007



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### ABSTRACT

This study aims to examine trends in outpatient psychotropic drug use among people with intellectual disabilities in Taiwan. The NHI outpatient medication records between January 1, 1997 and December 31, 2007 for people with intellectual disabilities were analyzed to observe the percent change, prevalence and prescription trends in psychotropic drugs. The overall prevalence of psychotropic medication increased from 17.82% to 23.22% during the study period. Results from stepwise logistic analysis demonstrated that females, the elderly, and individuals suffering from catastrophic disease were more prone to receive psychotropic drugs and that those with mild intellectual disability were less likely to receive psychotropic drugs. The percentage change in prescription rates of antipsychotics, hypnotics/sedatives, and antidepressants were 85.30%, 127.25%, and 167.50%, respectively, and the trends were statistically significant ( $p < 0.05$ ). Taiwan's NHI program and off-label use of psychotropic drugs might have attributed to this trend.

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## 1. Introduction

Individuals with intellectual disabilities (ID) may have problems with expressing their thoughts, learning, performing daily tasks, making decisions, and memory. Subsequently, when they experience a mental health issue, it may not be recognized. However, it is generally acknowledged that adults with ID experience a similar distribution of mental disorders, and a similar severity of symptoms as adults in the general population (Fletcher, Loschen, Stavarakaki, & First, 2007). Reports on the prevalence of psychiatric disorders among adults with ID range widely, between 10% and 50%, depending on the sample selection, definition of psychiatric illness, and level

of ID (Australian Institute of Health and Welfare, 2008; Bhaumik, Tyrer, McGrother, & Ganghadaran, 2008; Tonge, Einfeld, Krupinski, Mackenzie, & McLaughlin, 1996).

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There is evidence that people with ID have a high prevalence of the full range of mental disorders and challenging behaviors (Bregman, 1991; Holland, 1999; Matson & Boisjoli, 2007), e.g., bipolar disorder (Matson, Gonzalez, Terlone, Thorson, & Laud, 2007), pervasive developmental disorder not otherwise specified (Ghaziuddin, 2000), major depression (Matson, Terlone, Gonzalez, & Rivett, 2006), and attention deficit hyperactivity disorder (Rose, Bramham, Young, Paliokostas, & Xenitidis, 2009). Subsequently, to improve psychological status and problem behaviors, antipsychotic medication use is especially high in the ID population (Matson & Mahan, 2010).

Over the past several decades, psychotropic drugs have assumed great significance in the treatment of psychiatric disorders. The most commonly used psychotropic drugs are antipsychotics, mood stabilizers, antidepressants, anxiolytics, hypnotics, and sedatives (Matson & Mahan, 2010). The prevalence rates for psychotropic drug use vary widely between countries (Chien et al., 2007; Paulose-Ram, Jonas, Orwig, & Safran, 2007; Richter, Mann, Meyer, Haastert, & Köpke, 2012).

Many studies in Taiwan have found that although people with ID have a higher risk of ill health and physical disease than the general population (Chiang, Chang, Lin, Tung, Lin, & Hus, 2013; Lin et al., 2007, 2009, 2010a,b), they also suffer from many psychiatric or behavioral disturbances, known as 'dual diagnosis' (Lin et al., 2005). However, general information regarding antipsychotic medication use among individuals with ID in Taiwan is lacking. The purpose of this study was to describe the trends in use of psychotropic medicine for treatment of persons with ID in Taiwan.

## 2. Methods

This study analyzed psychotropic medication utilization in persons with ID in Taiwan by analyzing data from the national health insurance ambulatory service, from the National Health Insurance program (NHI), provided by the National Health Research Institute (NHRI). The detailed structure of data sets and information safety precautions are described on the NHRI web site (NHRI, 2011a, b). To eliminate financial barriers to accessing medical services and to solve social problems caused by poverty and illness, the NHI program was launched in Taiwan in 1995. The NHI program is a compulsory social insurance program, covering 99.60% of the population in Taiwan, with 92.60% of the medical institutions in Taiwan affiliated with the Bureau of National Health Insurance (BNHI) at the end of 2011 (BNHI, 2013). The data sets utilized in our study contained ambulatory care expenditures by visit and the details of ambulatory care orders, including the dates of visit, medical care facility, patient's gender, date of birth, the three major diagnoses, medical expenses, and drug prescribed by the physician for each visit from all medical care institutions under contract with the BNHI of Taiwan. Psychotropic drugs were recorded based on the anatomical therapeutic chemical (ATC) classification system (World Health Organization, 2005). Data presented in this study were limited to four main drug categories: antipsychotics (N05A), anxiolytic drugs (N05B), hypnotics/sedatives (N05C), and antidepressants (N06A).

The NHI outpatient medication records of ID insurers from January 1, 1997 to December 31, 2007 were analyzed to examine temporal changes in the use of antipsychotics, anxiolytic drugs, hypnotics/sedatives, and antidepressants. All claimants who had any record of using psychotropic medications in ambulatory care were identified in each year. The percent change, prevalence and trends in prescriptions for psychotropic drugs were assessed. The percent change and the prevalence of use of psychotropic drugs were stratified by gender, age group, ID level and copayment status (Chiang et al., 2013). Percent change was determined by comparing 1997 data with 2007 data (Chien et al., 2007), and the linear model test was applied to assess trends in the prevalence of use of psychotropic drugs. To estimate the prevalence of psychotropic drug use, the denominator was the total number of persons in the study sample each year, and the numerator was the number of insured in each year who had received psychotropic medication treatment. The Cochran–Armitage trend test and stepwise logistic regression analysis were performed to test the association between receiving or not receiving psychotropic drug treatment. Statistical analysis was performed with SAS 9.2 for Windows (SAS Institute Inc., Cary, NC, USA).

## 3. Results

Table 1 shows the demographic characters of the study population from 1997 to 2007. The number of ID subjects utilizing outpatient services increased from 67,143 to 93,914, a 39.87% increase during the study period. The ratio between male and female insured patients included in the study remained constant, at approximately 59–41%. The proportion of preschool children dropped dramatically from 27.03% to 1.83% ( $p < 0.001$ ). More than half of people with ID resided in urban areas, however, the percentage residing in urban areas decreased from 53.29% to 50.76% ( $p = 0.003$ ). The proportion of individuals suffering from catastrophic disease and social welfare recipients increased two and three times during the 11-year period ( $p < 0.001$ ), respectively.

Table 2 presents the prevalence and Cochran–Armitage trend test results of the study population receiving psychotropic medicine treatment from 1997 to 2007. The overall prevalence of psychotropic medication use increased by 30.30%, from 17.82% to 23.22%, and the prevalence of non-psychotropic medication use dropped from 82.18% to 76.78% ( $p < 0.001$ ) during this 11-year period. The Cochran–Armitage trend test confirmed that these shifts were statistically significant. After stratification, all variables increased significantly, except in elderly and adolescent subjects ( $p > 0.05$ ). Stepwise logistic analysis results demonstrated that females, the elderly, and insured patients suffering from catastrophic disease were more prone to receive psychotropic drugs, and subjects with mild ID were less likely to take psychotropic drugs. Female individuals with ID had a higher proportion of psychotropic drug use than their male counterparts (OR = 1.032, 95% CI = 1.021–1.043). The percentage of drug use in elderly ID subjects was higher than in any other age group (elderly vs. age

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