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## Sociodemographic characteristics and health-related factors affecting the use of Pap smear screening among women with mental disabilities in Taiwan

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## ABSTRACT

This study examined the use of the Pap cervical cancer screening test among women with mental disabilities in Taiwan and analyzed factors related thereto. Data were obtained from three national databases in Taiwan: the 2008 database of physically and mentally disabled persons from the Ministry of the Interior, 2007–2008 Pap smear test data from the Health Promotion Administration, and claims data from the National Health Insurance Research Database. The study subjects included 49,642 Taiwanese women aged  $\geq 30$  years with mental disabilities. Besides descriptive and bivariate analyses, logistic regression analysis was also performed to examine factors affecting Pap smear use. In 2007–2008, Taiwanese women with mental disabilities had a Pap screening rate of 11.05%. Age, income, education, marital status, catastrophic illness/injury, relevant chronic illnesses, and severity of disability were identified as factors affecting their Pap smear use. Age and severity of disability were negatively correlated with Pap screening, with the odds of screening being 0.37 times as high in  $\geq 70$ -year-olds as in 30–39-year-olds and 0.49 times as high for very severe disability as for mild disability. Income was positively correlated with Pap screening. Being married (OR = 2.55) or divorced or widowed (OR = 2.40) relative to being unmarried, and having a catastrophic illness/injury (OR = 1.13), cancer (OR = 1.47), or diabetes (OR = 1.25), were associated with greater odds of screening. In Taiwan, women with mental disabilities receive Pap smears at a far lower rate than women in general.

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### 1. Introduction

Cervical cancer is among the top ten most common cancers in women worldwide, with over 85% of the cases occurring in developing countries (Jemal et al., 2011). The Pap smear test for cervical cancer screening has been recognized as a highly effective preventive measure, and its systematic use has reduced cervical cancer mortality by an estimated 70% in developed

Abbreviations: CI, confidence interval; IDS, integrated delivery system; NT\$, New Taiwan dollar; OR, odds ratio; SAS, statistics analysis system.

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countries (Kitchener, Castle, & Cox, 2006). In Taiwan, the National Health Insurance program has provided free annual Pap screening to women 30 years and older since 1995, and has successfully reduced the age-adjusted annual mortality rate for cervical cancer from 10.5 to 3.9 per 100,000 population from 1996 to 2012 (Ministry of Health and Welfare, 2013). A similar downward trend has been observed in other countries. In Canada, cervical cancer mortality decreased from 13.5 to 2.2 per 100,000 populations per year from 1952 to 2006 (Dickinson et al., 2012); in England and Wales, cervical cancer mortality fell by 4.6% per year between 1988 and 2001 (Comber & Gavin, 2004). Previous studies in Taiwan found the use of the Pap screening service to be affected by such factors as women's age, income, health status, area of residence (Chen et al., 2007), marital status, education level, (Chang, Hsiung, Chen, Yen, & Chen, 2007), and severity of disability, if present (Chen et al., 2009; Huang, Tsai, & Kung, 2012). The Pap smear screening rate in Taiwan in 2008 was 28.8% for women general (Bureau of Health Promotion, 2011).

According to the World Health Organization's World Mental Health surveys, the 12-month prevalence of mental illness ranged from 7.1% (China) to 27.0% (United States) (Kessler et al., 2009). Studies showed that people with mental illness died on average 10–15 years earlier than the general population (Farnam, Zipple, Tyrrell, & Chittinanda, 1999), had a greater disease burden than those without mental illness (Carney & Jones, 2006; Insel, 2008), and were less likely to use preventive health care services within recommended time frames (Druss, Rosenheck, Desai, & Perlin, 2002; Lord, Malone, & Mitchell, 2010; Salsberry, Chipps, & Kennedy, 2005). Although the incidence of cancer among psychiatric patients was no higher than that in the general population, their mortality from cancer was found to be 30% higher (Lawrence, Holman, Jablensky, Threlfall, & Fuller, 2000). Kisely et al. reported in 2013 that psychiatric patients were more likely to have metastases at the time of their cancer diagnosis and tended to receive less radiotherapy and chemotherapy for their cancers (Kisely, Crowe, & Lawrence, 2013), thus making cancer screening and detection especially important for individuals with mental illness.

A Canadian study found that women with psychosis were significantly less likely to have had a Pap test in the previous three years (47.1%) than women without psychosis (73.7%) (Tilbrook, Polsky, & Lofters, 2010). In contrast, a 2012 study in the United States found that women with psychosis, bipolar disorder or mania, or depression were significantly more likely than women without such disorders to receive cervical cancer screening (OR, 1.46–1.78) (Abrams et al., 2012). Few studies have examined the use of cervical cancer screening by women with mental illness in Asian countries including Taiwan.

In 2012, a total of 119,514 people were living with mental disabilities in Taiwan, of whom 49.2% were men and 50.8% were women, amounting to 0.51% of Taiwan's population. The aim of this study was to examine the use of the Pap smear test by Taiwanese women with mental disabilities and analyze factors affecting the women's Pap test use.

## 2. Materials and methods

### 2.1. Data source and participants

The study population consisted of 49,642 women aged 30 years and older who were registered as having mental disabilities in Taiwan's Ministry of the Interior's 2008 database of physically and mentally disabled persons. Mental disabilities included schizophrenia, affective disorders, delusional disorders, senile and presenile mental disorders, other organic mental disorders, other nonorganic mental disorders, and childhood-onset mental disorders.

Analyses used the secondary data set and were performed with the latest data available from three national databases in Taiwan: 2007–2008 Pap smear test data from the Health Promotion Administration, claims data from the National Health Insurance Research Database, and the 2008 database of physically and mentally disabled persons from the Ministry of the Interior. Patient data from different databases were linked through patients' national identification card numbers and then stripped of unique personal identifiers and encrypted in order to protect patient privacy.

The National Health Insurance program was implemented in Taiwan in 1995. The National Health Insurance Research Database (NHIRD) has been used extensively in many published studies in Taiwan (Chen et al., 2013; Chen & Lin, 2011; Hsu, Tsai, & Kung, 2013; Lin et al., 2013). Since the data sets were released for academic research purposes only by the government, and the identities of all study participants were scrambled, this study was exempt from informed consent. This study was approved by the institutional review board of China Medical University and Hospital (IRB No. CMUH102-REC3-076).

### 2.2. Description of variables

The independent variables examined included the following: demographic characteristics (age, marital status, and education level), economic status (premium-based monthly salary), residential environment (urbanization level of area of residence, from the most urbanized, or level 1, to the least, or level 8), health status (presence or absence of catastrophic illness/injury or of relevant chronic illnesses), and severity of disability (very severe, severe, moderate, or mild). The dependent variable analyzed was use of the Pap smear test during 2007–2008.

Economic status was measured by premium-based monthly salary, which is an individual's monthly income for the purpose of determining the health insurance premium under Taiwan's National Health Insurance system. Patients who were not employed were categorized as dependents, as they were typically parents, spouses, or children of income-earning individuals. The severity of mental disability was assessed by nationally recognized psychiatrists and categorized as very severe (completely dependent on caretakers or requiring close supervision), severe (requiring supervision), moderate

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