



## High blood pressure in adults with disabilities: Influence of gender, body weight and health behaviors

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### ABSTRACT

The aims of this study were to explore the mean and distribution of systolic and diastolic blood pressure, and to examine the influence of gender, body weight and health behaviors on hypertension in adults with disabilities. We analyzed the 2010 annual community health examination chart of adults with disabilities in east Taiwan. The study samples included 833 adults with disabilities whose age 30 years and over participated in the analyses. The mean value of diastolic and systolic blood pressure (mmHg) of the study participants was  $76.51 \pm 12.65$  (range = 40–155) and  $127.39 \pm 20.32$  (range = 77–221). Fifteen percent and 23.4% of the participants have high diastolic ( $\geq 90$  mmHg) and systolic ( $\geq 140$  mmHg) blood pressure. There were 27.4% of the participants who had hypertension, high diastolic or/and systolic blood pressure. Finally, we found that the factors of older age (OR = 2.45, 95% CI = 1.22–4.93), overweight or obese in BMI (OR = 6.72, 95% CI = 1.90–23.78; OR = 6.76, 95% CI = 1.84–24.84), waist circumference (OR = 1.64, 95% CI = 1.03–2.61) and vegetable/fruit intake (OR = 0.61, 95% CI = 0.39–0.94) were variables that could significantly predict the hypertension condition of the subjects after controlling factors of marital status, type and level of disability. To improve the healthcare for people who suffer with and prevention for hypertension, the study highlights the health authorities should pay much attention to blood pressure condition and their determinants for people with disabilities in the communities.

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### 1. Introduction

Elevated blood pressure associated with higher risk of heart attack, heart failure, stroke, and kidney disease (Chobanian et al., 2003), and it is one of the components of the metabolic syndrome (Grundy et al., 2005). Hypertension is one of the cardiovascular disease risk factors for the development of functional disability (Hubert & Fries, 1994; Pinsky et al., 1985). Elias, Dore, Davey, Robbins, and Elias (2010) had examined the hypothesis that lowered cognitive performance plays a role in the relation between elevated blood pressure and physical disability in performing basic physical tasks.

Di Bari et al. (2001) found people with relative risks of incident cognitive impairment and disability were more likely to miss the assessment of hypertension and the appraisal of a protective effect of hypertension treatment. Furthermore, Wilmanska (1998) also found that therapy of hypertension in disabled elderly people was ineffective in most of the hypertensive patients. Therefore, it is an urgent need for establishing a more efficient concept of primary prevention as well

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as better and comprehensive treatment of the essential hypertension in order to reduce morbidity and disability of the people.

Regular health screening has an important contribution to make to improve the health of people with disabilities (Barr, Gilgunn, Kane, & Moore, 1999). In identification of health risk associated with higher blood pressure, the purposes of this study were to explore the mean and distribution of systolic and diastolic blood pressure, and to examine the influence of gender, body weight and health behaviors on hypertension in adults with disabilities whose age 30 and over by using data from 2010 community health examination.

## 2. Methods

The present study analyzed 2010 annual health examination chart of adults with people with disabilities in Taiwan. Those adults with disabilities can freely participate the health screening which provided by a local government – Yilan County. The study population included adults with disabilities participated in the annual health examination, and research cooperative approval was received from the local health department.

The study samples included 833 adults with disabilities (age 30 years and over) who participated in the analyses. The analyzed information included client's demographic characteristics (gender, age, education, marital status, disability type and level), body mass index (BMI:  $\text{kg}/\text{m}^2$ ) and waist circumference, health status (disease history and medication), health behaviors (smoking, drinking alcohol, exercise, betel nut chewing, milk and vegetable/fruits consumption) and elevated blood pressure (BP; systolic BP  $\geq 140$  mmHg or diastolic DP  $\geq 90$  mmHg).

Data were analyzed by statistical software SPSS 18.0; we used number, percentage, mean, standard deviation (S.D.), and range to describe the sample demographic, health status and health behavioral characteristics, and to use chi-square method to analyze their relation with elevated blood pressure (hypertension). A logistic regression method which included Odd Ratio (O.R.) and 95% Confidence Interval (C.I.) was conducted to identify the potential risk factors associated with hypertension occurrence.

## 3. Results

### 3.1. Demographic characteristics of the subjects

Table 1 describes the demographic characteristics of the study participants. Of the 833 adults with disabilities in this study, 59.3% were men and 40.7% were women, and mean of age was  $61.16 \pm 16.59$  years (range = 31–98 years). More than fifty percent of the study subjects were less than primary school educational level, and 74.4% were married. There was 17.5% of the subjects were multiple disabilities, 34% have a limb disability, 16.4% were chronic psychosis, 8.9% were hearing impairments, and 8% have intellectual disability. With regard to the participant's disability level, most of the adults with disabilities in this study were diagnosed as mild and moderate levels of disability (35.5% and 32.4%, respectively).

### 3.2. Health characteristics and health behaviors of the subjects

In terms of the body figure of the participants, results of BMI analysis indicated that the mean value of BMI was 23.86, and 11.1% subjects were underweight, 42.6% were normal, 25.7% were overweight, 11.6% were pre-obese, 6.8% were obese class I, 1.8% and 0.5% were obese class II and III. There were 48.4% subjects have wider waist circumference (male  $\geq 90$  cm, female  $\geq 80$  cm), there were 80.4% cases have chronic disease history which include hypertension, diabetes, cardiovascular disease, stroke, cancer, hyperlipidemia, hepatitis B, kidney disease etc. and 61.9% cases have to take drug medication regularly at their daily livings (Table 2).

With regard to the health behaviors of the participants, smoking rate was 11.8%, alcohol drinking rate was 1.9% and betel nut chewing rate was 1.1%. There were 20.9% participants do regular exercise which at least 3–5 times a week, and 18.6% women had ever used Pap smear tests. Nutritious food taking survey indicated that 36.7% cases have a habit of drinking milk and 57% eat fresh vegetables and fruits daily (Table 3).

### 3.3. Blood pressure distribution of the subjects

Table 4 presents the mean value of diastolic and systolic blood pressure (mmHg) of the study participants was  $76.51 \pm 12.65$  (range = 40–155) and  $127.39 \pm 20.32$  (range = 77–221). Fifteen percent and 23.4% of the participants have high diastolic ( $\geq 90$  mmHg) and systolic ( $\geq 140$  mmHg) blood pressure. There were 27.4% subjects have a hypertension which they have high diastolic or/and systolic blood pressure. Fig. 1 shows the prevalence of hypertension, high diastolic and systolic blood pressure in difference gender, the results illustrated female subjects have higher elevated percent of these three prevalences than male individuals with disabilities.

We analyzed chi-square correlation between hypertension rate and subjects' characteristics in the bivariate analysis (Tables 5–7). The results showed older age ( $p < 0.001$ ), married status ( $p < 0.001$ ), different disability type and level of disability ( $p < 0.001$ ) were significantly correlated to the occurrence of hypertension. The body figure analysis of the subjects found factors of BMI ( $p < 0.001$ ) and waist circumference ( $p < 0.001$ ) were significantly correlated with hypertension

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