



Predictors of Internet use for health information among male and female Internet users: Findings from the 2009 Taiwan National Health Interview Survey



Malcolm Koo^{a,b,1}, Ming-Chi Lu^{c,d,1}, Shih-Chun Lin^{e,*}

^a Department of Medical Research, Dalin Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, Dalin, Chiayi, Taiwan

^b Dalla Lana School of Public Health, University of Toronto, Toronto, Ontario, Canada

^c Division of Allergy, Immunology and Rheumatology, Dalin Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, Dalin, Chiayi, Taiwan

^d School of Medicine, Tzu Chi University, Hualien, Taiwan

^e Division of Geriatrics, Dalin Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, Dalin, Chiayi, Taiwan

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ABSTRACT

Background: The Internet is an increasingly important source of health information for the general population. Both preventive health behavior and Internet use are known to be different between men and women. However, few studies have compared predictors of Internet use for health information between the sexes.

Objectives: To investigate the prevalence and predictors of Internet use for health information among male and female adult Internet users using data from a population-based survey in Taiwan.

Methods: Respondents between the ages of 20–65 years were identified from the dataset of the 2009 Taiwan National Health Interview Survey. The outcome variable of the study, the utilization of the Internet for health information, was ascertained by asking whether the respondent had ever used the Internet to search for health information or obtain health services. Univariate and multivariate logistic regression analyses were conducted separately for men and women to evaluate factors associated with the use of Internet for health information.

Results: Of the 2741 adults aged 20–65 years who had ever used the Internet, 1766 (64.4%) of them had used it for health information or services. Multivariate logistic regression analyses showed that a higher educational level (adjusted odds ratio [AOR] = 3.60, $P < 0.001$), living alone (AOR = 1.77, $P = 0.019$), had exercised in the past two weeks (AOR = 2.41, $P < 0.001$), residing in city or urban district (AOR = 1.28, $P = 0.049$), with a perceived health status of extremely good, very good, or good (AOR = 1.34, $P = 0.022$), and had used Western medicine services in the past month (AOR = 1.51, $P = 0.005$) were significantly associated with health information use in male Internet users. On the other hand, age between 20–44.9 years (AOR = 1.87, $P < 0.001$), a higher educational level (AOR = 3.57, $P < 0.001$), being married (AOR = 1.68, $P = 0.001$), had exercised in the past two weeks (AOR = 1.56, $P < 0.001$), and had a mean monthly personal income of NT\$ 20,000 and above were significant factors in female Internet users.

Conclusions: This secondary data analysis of a representative sample of Taiwan population revealed that a similar but not identical set of independent factors was associated with the use of Internet for health information between male and female Internet users.

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1. Introduction

The Internet has provided an unprecedented level of instant access to a wide range of information and services. Searching for

health information is one of the most popular online activity [1–3]. Nevertheless, as early as 2001, it has been pointed out the quality of information, disparities in access, low health literacy, and disorganization of the information were some of the challenges for Internet health information seekers [4]. Subsequent studies repeatedly showed that the general population does not possess sufficient information and strategic Internet skills [5]. It has been suggested that people who would need the Internet most as a source of health

* Corresponding author at: 2 Minsheng Road, Dalin, Chiayi 62247, Taiwan.

E-mail address: df559699@tzuchi.com.tw (S.-C. Lin).

¹ Malcolm Koo and Ming-Chi Lu contributed equally to this work.

information, due to poor health or low socioeconomic status, are also those who least likely use it [6].

Previous studies have indicated that there were clear sex differences in Internet use [7,8], preventive health behavior [9], health-related help seeking behavior [10], and health information seeking [11]. According to a Pew report in 2005, women, age below 65 years, college graduates, more online experience, and had broadband access were more likely to seek online health information [12]. The 2009 Annenberg National Health Communication Survey also indicated that women were more likely to be active health information seekers than men [13]. Another survey on 1001 respondents in South Korea showed a sex difference in seeking health information on the Internet [14]. Although a number of studies have focused on accessing the predictors of Internet use for health information in women [15,16], few have simultaneously compared the predictors in the same study. Therefore, the objective of this study was to investigate the prevalence and predictors of Internet use for health information in male and female adults in Taiwan.

2. Material and methods

2.1. Study design and data source

This study is a secondary analysis of the data from the 2009 National Health Interview Survey (NHIS), which was designed to yield a sample representative of the civilian noninstitutionalized population of Taiwan. Individuals in the NHIS were sampled using a multistage, stratified, systematic sampling design based on geographic location and level of urbanization. All selected individuals were interviewed by trained interviewers face-to-face using computer assisted personal interviewing (CAPI). Further details regarding questionnaire content and sampling design can be found at the NHIS website (<http://nhis.nhri.org.tw/>).

The study protocol was reviewed and approved by the institutional review board of the study hospital (No. B10302017). Since the datafile contains only de-identified secondary data, the review board waived the requirement for obtaining informed consent from the patients.

2.2. Study participants

A total of 30,528 (1.33%) eligible individuals were sampled from the Taiwan population of 22,942,706 as of December 31, 2008. A total of 25,632 individuals completed the survey (84.0% response). Of them, 16,848 were adults aged 20.0–65.0 years. In addition, a random sample of 4067 respondents was further selected using the CAPI software to respond to a set of optional questions including the utilization of medical resources on the Internet. Of these 4067 individuals, 2741 (67.4%) indicated that they had ever used the Internet.

2.3. Outcome and independent variables

The main outcome of the study, the utilization of the Internet for health information, was ascertained by asking whether the respondent had ever used the Internet to search for health information or obtain health services, including treatment of diseases, health care, preventive medicine, psychological counseling, folk remedies, aromatherapy, hypnotherapy, and other related information.

The independent variables evaluated in this study included age, sex, body mass index, educational level, marital status, living arrangement, urbanization level of residence, monthly personal income, perceived health status, smoking habit, alcohol consumption, and use of Western and Chinese medicine outpatient services in the past month. In addition, among the respondents who had used the Internet for health-related information, they were asked

to indicate, from a list, the type of information that they had sought and the effects of the Internet search on their health behavior.

Age was divided into two categories: 20–44.9 versus ≥ 45.0 years. Body mass index was calculated as weight in kilograms divided by the square of height in meters. It is categorized into normal (18.5–24.0 kg/m²), underweight (<18.5 kg/m²), overweight (24.0–26.9 kg/m²), or obese (≥ 27.0 kg/m²) based on the criteria set by the Ministry of Health and Welfare in Taiwan. Educational level was divided into two categories: high school or below versus university or above. Marital status was dichotomized as married versus single, divorced, separated, or widowed. Level of urbanization was grouped into two categories: cities and districts versus towns and villages. Mean monthly personal income was divided into three categories: <20,000, 20,000–39,999, or $\geq 40,000$ New Taiwan Dollars (10,000 New Taiwan dollars approximately equal to 330 US dollars). There were 68 respondents with missing values in monthly personal income and they were assigned to the lowest category of <20,000 category). Perceived current health status was collapsed from five categories into two: excellent, very good, or good versus fair or poor. Alcohol use was ascertained by a question on whether the respondents had consumed alcohol in the past month. Smoking habit was dichotomized into two groups: daily and occasionally versus not smoking.

2.4. Statistical analysis

The differences in the independent variables between male and female Internet users were compared using Chi-square test. Univariate and multivariate logistic regression analyses with backward elimination method were conducted separately for men and women to evaluate factors associated with the use of Internet for health information. The data were weighted to achieve a nationally representative sample. A two-tailed *P* value of <0.05 was considered statistically significant. All statistical analyses were conducted using IBM SPSS Statistics software package, version 22.0 (IBM Corp, Armonk, NY, USA).

3. Results

Of the 2741 adults aged 20–65 years who had ever used the Internet, 1766 (64.4%) of them had used it for health information or services. The mean age of the 2741 Internet users was 35.7 years (standard deviation = 10.2 years) and 50.5% were males. **Table 1** shows the distribution of the independent variables among the male and female Internet users. The proportion of respondents who were overweight or obese was significantly higher in males ($P < 0.001$). Mean monthly personal income was also significantly higher in males ($P < 0.001$). A significantly higher proportion of male Internet users indicated that they smoked daily or occasionally ($P < 0.001$) and had consumed alcohol in the past month ($P < 0.001$) compared with female Internet users. Conversely, more female Internet users responded that they had fair or poor perceived health status ($P = 0.003$) and a higher proportion of them had used Western ($P < 0.001$) and Chinese ($P < 0.001$) medicine outpatient services in the past month. Over 70% of the female Internet users, compared with 59% of the male Internet users ($P < 0.001$), reported that they had used the Internet for health information.

Results of the univariate logistic regression analyses of the factors associated with Internet use for health information among Taiwanese male and female Internet users are shown in **Table 2**. In men, the significant factors included educational level, living arrangement, urbanization level of residence, mean monthly personal income, perceived health status, smoking habit, alcohol consumption in the past month, and Western medicine outpatient services use in the past month. In women, age, body mass index,

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