



## Association between Pap smear screening and job stress in Taiwanese nurses



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### ABSTRACT

**Purpose:** Nursing is a professional job characterized by high stress. Stress could be associated with less practice of health promoting behaviors; however, no study has investigated the relationship between job stress and health screening behaviors among nurses. This study aimed to describe the rate of Pap smears in hospital nurses and examine the effects of job stress on receiving a Pap smear.

**Methods:** This study was a cross-sectional survey. The study participants were 30,681 full-time female nurses who were at least 30 years of age working in 100 hospitals across Taiwan. The study participants filled out an anonymous structured questionnaire from May to July, 2011. The outcome variable was having a Pap test during the previous 3 years. The level of stress was measured by a 19-item scale, with higher scores indicating higher stress levels.

**Results:** About 62.4% of the nurses had a Pap smear during the previous three years. Each point increase in the stress score decreased the likelihood of Pap smears (OR = .997, 95% CI: .995–.999), after adjustment for participant characteristics, health status, health behaviors, and hospital characteristics.

**Conclusion:** Despite more knowledge and higher accessibility, nurses were less likely to have Pap smear screening than the general population. A higher level of job stress was associated with a lower likelihood of having a Pap smear. Hospital administrators could help decrease work-related stress and improve stress adaptation among nurses in order to improve their health screening behaviors.

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## 1. Introduction

Cervical cancer is a largely preventable disease, but worldwide it is one of the leading causes of cancer death in women (WHO, 2014). Cervical cancer has the second highest incidence of all female cancers and is the third highest cause of cancer mortality worldwide (WHO, 2012). The disease is responsible for more than

270,000 deaths annually (WHO, 2014). Cancer has been the leading cause of death in Taiwan since 1982 (Ministry of Health and Welfare, 2012a, b, c, d). The crude mortality rate of cervical cancer was 5.8 per 100,000 women in Taiwan in 2012. The standardized mortality rate of cervical cancer in Taiwan (6.6 per 100,000 women) ranked 29th among the 34 member counties of the Organization for Economic Cooperation and Development (OECD). This was double the median rate of 2.8 per 100,000 women in OECD countries in 2012 (Ministry of Health and Welfare, 2013).

A Pap smear can detect changes in cervical cells that suggest that cancer may develop in the future or that early-stage cervical cancer is present. Pap smear screening can decrease the incidence and mortality of cervical cancer by 60% and 90%, respectively (Li

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et al., 2012). The Taiwan Health Promotion Administration provides free Pap tests for all women 30 years old or older annually. The latest recommendation by the United States Preventive Services Task Force and American Cancer Societies is to screen women with Pap tests every 3 years (US Preventive Task Force, 2012). A study in Australia showed that a clear communication strategy will be needed to persuade women of the safety of the new recommendation (Scalzo and Mullins, 2015). In general, the recommendation that Pap tests be done at least once every 3 years is widely accepted.

A previous study reported that the rate of Pap smears in Taiwanese nurses 30–59 years old was 48.9%, which was significantly lower than that in non-nurse comparisons (56.2%; Chung et al., 2011). Nurses have more knowledge and better accessibility to health screening services than the general public. However, based on a previous study in Taiwan, their Pap smear screening behavior is no better, or even worse, than the general population (Chung et al., 2011).

Job stress has been defined as a feeling of discomfort from an organization and job (Parker and DeCotiis, 1983). One study reported that stress levels were inversely correlated with overall health-promoting behavior scores among registered nurses (Tucker et al., 2012). A study of Taiwanese hospital staff reported that better performance in health-promoting behaviors was associated with less job stress (Tsai and Liu, 2012). Millar (2005) reported that higher levels of perceived stress were associated with decreased processing of messages encouraging disease screening behaviors. Based on those studies, we speculate that job stress may be a potential reason for the lower rate of Pap smears among Taiwanese nurses. Nursing is a professional job characterized by high stress (Chen et al., 2012; Wang et al., 2007). A deteriorating work environment for nurses has been observed in Taiwan over the past decades, driven by global budgets of National Health Insurance (Chen and Chuang, 2011). A survey in 2010 reported that about 40% of nurses in Taiwan felt their workload was heavier than 3 years previously (Lu et al., 2010). Our previous study found that hospital nurses reported medium to high levels of job stress (Chiou et al., 2013).

Nurses who had Pap smear screening themselves are more likely to provide these services to their patients (Shekhar et al., 2013). Nonetheless, many nurses do not have Pap tests or offer these services to their patients (Kolutek and Ayci, 2014; Obeidat et al., 2012). Grime's et al. (2014) showed that nurse training programs can elevate the practice of cancer prevention among community-based nurses. Given the frequent contact between nurses and patients, understanding Pap smear screening behaviors among nurses may increase Pap smear screening among nurses as well as patients. The focus of the study was on cervical cancer screening behaviors because a Pap smear is an effective screening test which can be performed in every hospital in Taiwan and no appointment is necessary.

## 2. Literature review

Job stress is caused by a mismatch between workers' job demands and their ability and resources to do the job (Huang et al., 2002). Job stress is related to poor health status and increased medical errors and incidents among nurses (Chiou et al., 2013; Healy and McKay, 2000). Studies have reported that the job stress among nurses is caused by heavy workloads, shift schedules, role conflicts, interpersonal problems, violent attacks, inadequate preparation, and uncertainty about treatment outcomes (Lim et al., 2010; Sveinsdottir et al., 2006).

Tucker et al. (2012) conducted an electronic survey of 2247 staff nurses from a large midwestern medical center in the USA. They reported that perceived stress levels were negatively associated

with overall health-promoting behavior scores among nurses. King et al. (2009) conducted a mail survey of 435 nurses in Ohio. They found that the level of stress was positively associated with eating disorders among nurses. Nurses with high levels of perceived job stress had higher involvement in disordered eating. Those researchers suggested that stress could reduce the practice of health behaviors among nurses, although the relationship between job stress and Pap smears has not been examined. Those studies were limited to the US context and the study nurses were confined to one hospital or one state.

Factors associated with Pap smear behavior in the literature have included age, educational level, marital status, body mass index, chronic disease, physical examinations, smoking, and drinking (Chiang et al., 2011; Ferrante et al., 2007; Kiefe et al., 1998; Lai et al., 2012; Liou and Huang, 2005; Lopez-de-Andres et al., 2010; Mitchell et al., 2008; National Health Interview Survey, 2012; Peter et al., 2010; Rasu et al., 2011; Smith et al., 2011; So et al., 2012; Wall et al., 2010). Besides these variables, working in accredited health promoting hospitals could increase the chance of receiving a Pap smear because of the emphasis on staff health. Therefore we included these variables in the study.

### 2.1. Aim

To the best of our knowledge, no study has investigated the relationship between job stress and health screening behaviors among nurses. This information could be informative in designing hospital-based health promotion programs for nurses. The objectives of this study were to determine the rate of Pap smears and examine the effects of the level of job stress on receiving Pap smears in hospital nurses in Taiwan. The following research questions were asked.

- What is the rate of Pap smears during the past 3 years in hospital nurses?
- Does the mean level of job stress differ between hospital nurses who received and did not receive a Pap smear during the previous 3 years?
- Is the level of job stress in hospital nurses associated with receiving a Pap smear during the previous 3 years after adjustment for age, educational level, marital status, body mass index, chronic disease, physical examination, smoking, drinking, and status of accredited health promoting hospital?

## 3. Methods

### 3.1. Design and sample

This study was a cross-sectional survey, and included all full-time staff members working in 100 hospitals across Taiwan. All 66 members of the Taiwan Health Promoting Hospitals project were invited to participate in the study. Using the distribution of accredited hospital levels of Health Promoting Hospitals, we drew a random sample of non-Health Promoting Hospitals using a 1:1 ratio. Since 45 Health Promoting Hospitals were regional hospitals and only 40 non-Health Promoting Hospitals were regional hospitals, all non-Health Promoting regional hospitals were invited, which resulted in a total of 61 non-Health Promoting Hospitals. Of the 127 hospitals selected, 100 (78.7%) agreed to participate in this study. Details of the study design are presented elsewhere (Chiou et al., 2013).

The survey was conducted from May to July, 2011. Staff members in the selected hospitals were asked to complete and return the anonymous questionnaires in the sealed envelopes provided to a collection site at the hospitals. Ethical aspects of the study were

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