

Table 1. Showing characteristics of the cohort members according to workplace institute.

Characteristics	% Total (n=16,814)	% Hospitals (n=13,208)	% Health centers (n=1,468)	% Others (n=2,138)
Age				
29 or smaller	1,583 (9.7)	1,385 (10.8)	92 (6.4)	106 (5.1)
30 – 34	1,693 (10.3)	1,387 (10.8)	181 (12.6)	125 (6.0)
35 – 39	2,561 (15.6)	2,016 (15.7)	317 (22.0)	228 (10.9)
40 – 44	3,006 (18.3)	2,344 (18.2)	359 (25.0)	303 (14.4)
45 – 49	3,403 (20.8)	2,694 (21.0)	277 (19.3)	432 (20.6)
50 – 57	4,143 (25.3)	3,027 (23.5)	212 (14.7)	904 (43.1)
Mean ± SD	42.6±9.0	42.1±9.1	41.4±7.7	46.1±8.6
Range (Min-Max)	20.5-57.9	20.5 -57.9	22.8 – 57.9	22.4 – 57.9
Gender				
Female	16,149 (96.6)	12,741 (97.0)	1,411 (96.5)	1,997 (94.0)
Male	567 (3.4)	389 (3.0)	51 (3.5)	127 (6.0)
Marital status				
Single	5,245 (30.3)	4,397 (33.4)	241 (16.5)	607 (28.5)
Married	10,201 (60.9)	7,806 (59.3)	1,085 (74.4)	1,310 (61.5)
Separated	1,306 (7.8)	960 (7.3)	133 (9.1)	213 (16.0)
Region				
Bangkok	2,443 (15.2)	1,877 (14.7)	152 (10.7)	414 (21.1)
North	3,366 (20.9)	2,762 (21.7)	278 (19.6)	326 (16.6)
Northeast	3,769 (23.4)	2,827 (22.2)	477 (33.6)	465 (23.7)
Central	4,463 (27.7)	3,665 (28.8)	291 (20.5)	507 (25.8)
South	2,082 (22.9)	1,609 (12.6)	220 (15.5)	253 (12.9)
Income				
Insufficient /unstable	3,941 (23.7)	309 (23.0)	493 (33.8)	439 (21.0)
Sufficient/saving	12,709(76.3)	10,088 (77.0)	967 (66.2)	1,654 (79.0)
Currently major work position				
Service nurses	10,857 (65.2)	9,099 (69.4)	1,111 (76.3)	647 (31.2)
Nurse lecturers/researchers	849 (5.1)	64 (0.5)	70 (4.8)	715 (34.5)
Administrators	3,932 (23.6)	3,459 (26.4)	94 (6.5)	379 (18.3)
Others	989 (5.9)	494 (3.8)	181 (12.4)	314 (15.4)
Did not work	21 (0.1)	1 (0.01)	1 (0.07)	19 (0.9)
Working status				
Government officers	13,901(83.1)	10,958 (83.2)	1,375 (93.9)	1,568 (75.0)
Government employees	663 (4.0)	575 (4.4)	38 (2.6)	40 (2.4)
State enterprises employees	82 (0.5)	46 (0.4)	2 (0.1)	33 (1.6)
Private employees	1,229 (7.4)	997 (7.6)	19 (1.3)	213 (10.2)
Business owners	85 (0.5)	3 (0.02)	10 (0.7)	72 (3.4)
Others	771 (4.6)	595 (4.5)	20 (1.4)	156 (7.5)

NOTE. Values are expressed as number and percentage, n (%). There are missing data for some variables, hence, not summing to the total number on the header.

Rate of intention to leave a nursing career

There were 3.8% at 95% CI = 3.54 - 4.46% of nurses reported an intention to leave a nursing career within 1-2 years. The analysis revealed that registered nurses who had experienced workplace violence intended to leave their careers were more likely to report an intention to leave, relative to those who had not experienced work place violence where the rates of workplace violence were 6.27% at 95% CI =

5.36 - 7.19, and 3.40% at 95% CI = 3.08 - 3.78, respectively (Figure 2). The results of an intention to leave a nursing career to either within 1-2 years or later after redefining the workplace violence showed a more profound level of difference between intention to leave rates between nurses who had experienced work place violence, and those who had not, which the values were 19.7% at 95% CI = 18.19 -21.21, and 12.44% at 95% CI = 11.86 - 13.03, respectively.

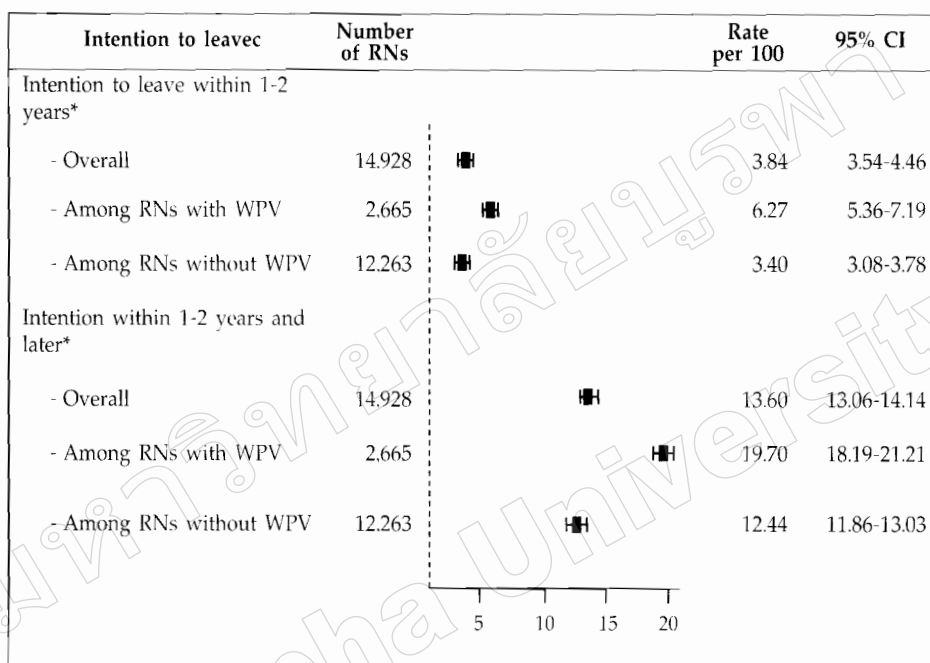


Figure 2. Rates of intention to leave among Thai registered nurses.

RNs = registered nurses. WPV = workplace violence. CI = confidence interval

*There are some missing data for some variables, hence, not summing to the overall number.

Multivariate analysis concerning workplace violence and intention to leave a nursing career.

Analysis results on effects of workplace violence on intention to leave a nursing career within 1- 2 years were made based on multiple logistic regression, and it was shown that 48% were more likely intended to leave the nursing profession in all types of workplace violence, where the value of OR = 1.48 at 95% CI = 1.09-2.01, and the value of *p* at 0.012 (Figure 3). This was also true for the non-physical workplace violence

where the value of OR = 1.48 at 95% CI = 1.08 - 2.02, and *p-value* = 0.014. The above odds ratios were adjusted for the effect of demographic factors (i.e., age, gender, marital status, and working status), experiencing with some illness (e.g., illness related to brain, hypertension, cardiovascular diseases), had musculoskeletal pains, chemical spill out, cutting injury, workload and shift work, conflict within the workplace, and working region.

Analysis results on effects of workplace violence on intention to leave a nursing career within 1-2 years

or years later were made after redefining the outcome as intention to leave their nursing career either within 1-2 years or years later. It was found that all types of workplace violence remained significantly associated with intention to leave a nursing profession for either with job absence, where the value of OR = 1.58 at

95% CI = 1.35-1.86 and the *p-value* was <0.001, while all types of workplace violence with job absence gave the stronger risk of intention to leave, which the value of OR = 1.98 at 95% CI = 1.22-3.22, and the *p-value* was 0.006. Results are shown in Figure 4.

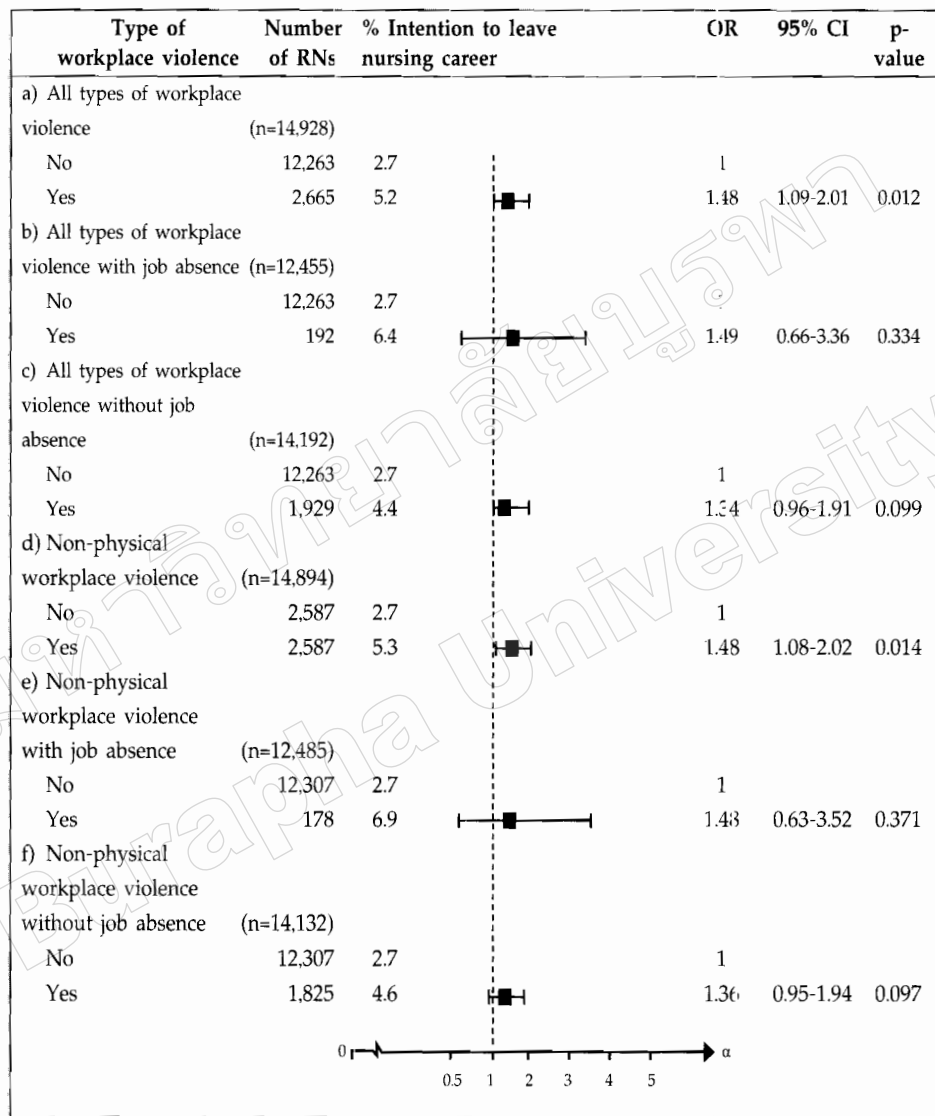


Figure 3. The effect of workplace violence on the intention to leave a nursing career within 1-2 years adjusted for demographic factors, experiencing with some illness, had musculoskeletal pains, chemical spill out, cutting injury, workload and shift work, conflict within the workplace, and working region. RNs = registered nurses, OR = odds ratio, CI = confidence interval

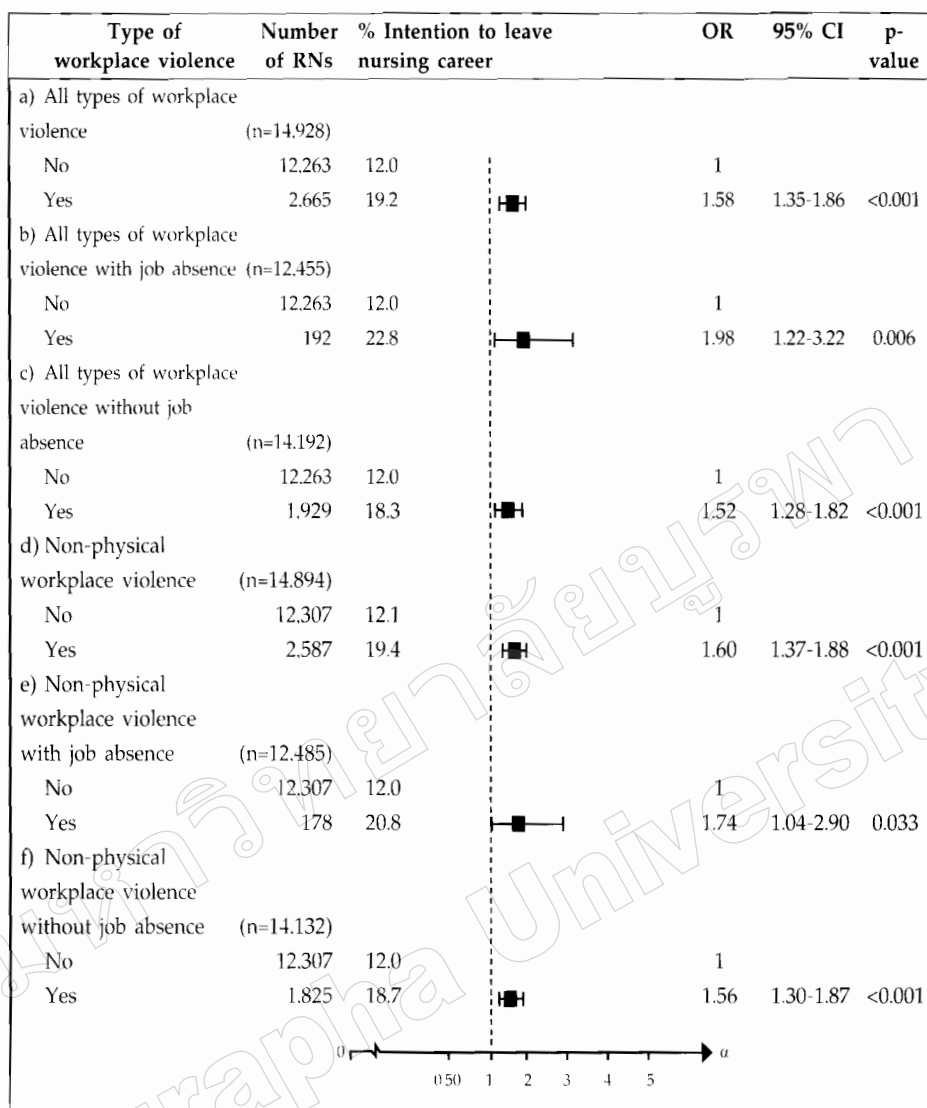


Figure 4. The effect of workplace violence on the intention to leave nursing career within 1-2 years and later adjusted for demographic factors, experiencing with some illness, had musculoskeletal pains, chemical spill out, cutting injury, workload and shift work, conflict within the workplace, and working region.
 RNs = registered nurses. OR = odds ratio, CI = confidence interval

DISCUSSION

A nursing turnover is a complex phenomenon. Effective strategies for the retention of nurses within the nursing professional require information regarding its associated factors. The present study investigated the relationship between workplace violence and an

intention to leave nursing careers based on a cross-sectional survey of a nationally representative sample of registered nurses in Thailand. This is the first wave survey of the Thai Nurse Cohort Study, which has been established to address both the crisis of nursing workforce and women health. To the best of our

knowledge, this is the first nurse cohort study in South East Asia. It could serve as evidence for low- and middle-income countries where ways of living, environments, and health behaviors differ from that of the western or high-income countries.

The rate for intending to leave their nursing career of Thai registered nurses were 3.8% and 13.6% for the given time intervals of within 1-2 years and within 1-2 years later, respectively. This is comparable to a previous survey in Thailand (Sawangdee, 2008) but is lower than those in other countries where the rates vary between 5% and 40% (Kankaanranta and Rissanen, 2008; Chan et al., 2009). Based on the afore-mentioned data where the rate was 3.8%, however, it needed not be of concern as the new entry registered nurses as of 2009 and 2010, the 2-year duration after the survey, was 6,402. The number of nurses' intention to leave the profession based on the 3.8% rate would be 244. Based on the rate of 13.6% it would be approximately 871. These may represent alarmingly high turnover rate if they did according to what they intended. Moreover, these can be viewed as being the lowest figures as the rate are likely to be underestimated. This is because, in this study, nurses who have already left the career cannot be contacted. Although intention to leave is a subjective outcome, it's a warning sign for the appropriate organizations to explore its causes in order to retain their precious workforce. Workplace violence is one such aspect that needs for an investigation.

The present study demonstrated that after adjusting for effects of various factors, workplace violence remained a risk factor for an intention to leave among Thai registered nurses. Although an odds ratio of 1.48 is not that high, conveying a message that registered nurses who have experienced workplace violence are approximately 48% more likely to have an intention to leave their careers than those who do not. This confirms what has been shown in studies of other nurse populations, workplace violence represents an important risk factor for an intention to leave the nursing profession. Again, this magnitude of association is likely to be underestimated since

nurses who have already left the career cannot be contacted and their reasons could be the workplace violence as suggested by this finding.

Several factors have been demonstrated to be associated with an intention to leave the nursing profession. In the present study, we focused mainly on workplace violence, and commentary in the results section reflected this. However, our analysis did reveal a number of significant risk factors including, age (OR every 10 years = 1.46; 95% CI = 1.22 - 1.74; *p-value* <0.001), male nurses (OR = 2.04; 95% CI = 1.13 - 3.68; *p-value* = 0.018), had a conflict within the workplace (OR = 1.42; 95% CI = 1.22 - 1.66; *p-value* <0.001), having part-time jobs (OR=1.43; 95% CI = 1.08 - 1.90; *p-value* <0.013), had work-related musculoskeletal disorder (OR=1.38; 95% CI = 1.05 - 1.82; *p-value* <0.022), earned insufficient or unstable income (OR=1.37; 95% CI = 1.02 - 1.84; *p-value* <0.035), and being widow or divorce (OR=0.73; 95% CI = 0.56 - 0.96; *p-value* <0.024). These had already been adjusted for effects of current work position, experienced with illness diagnosed by physicians including cerebrovascular diseases, cardiovascular diseases, experienced with any worked-related illness such as cutting injury and not specify-chemical spill out, working region, working institute, working status, workload and shift work. All of these findings confirm what has been found in previous studies. Previous studies have identified income (Chan et al., 2009), gender (Estry-Behar et al., 2008; Heinen et al., 2013), job stress (Yin and Yang, 2002; Zhao et al., 2013), and old nurses (Heinen et al., 2013; Liu et al., 2012) are all independently associated with the intention to leave the nursing profession.

Regarding types of workplace violence, non-physical violence played a stronger role than physical workplace violence or an intention to leave a nursing career among Thai registered nurses. The increasing frequency of workplace violence against nurses reported globally means that there may be a downstream effect on nurse labor attrition. Whether this increase is due to increasing incidence of violence, or an increase in surveillance or reporting is yet to be established. Indeed, some types of violence have not been addressed

in the existing reporting system. This failure of the present reporting systems may be due to lack of concern in health organizations (Ferrinho et al., 2003), or ignorance on the part of the nursing victims themselves (Chen et al., 2009). Regardless of the cause, under reporting of the violence against nurses in several countries is likely to be the result (Kamchuchat et al., 2008). Thailand is not an exceptional case where the rate of all workplace violence in this study is quite low compared to previous reports (Sripichyakan et al., 2003; Kamchuchat et al., 2008). This may have arisen due to self-reporting and limited no explanation about the definition of the violence in the survey instrument. Thus quantitative - natured survey instruments may tend to underestimate the rate, which is compared to the qualitative methods (Sato et al., 2013). To obtain accurate information regarding the workplace violence, data collection should be implemented via face-to-face interview combined with qualitative methods. Moreover, a standard definition of workplace violence should be established globally for the sake of comparability.

It is possible that non-physical workplace violence is related to work stress (Farrell et al., 2006; Franz et al., 2010), which is one of factors that indirectly relates to nurses leaving their jobs (Yin and Yang, 2002). The finding in this study was similar to that reported in a Minnesota study which found that 7.4% of nurses who experienced physical violence reported subsequent changes in their work status while 21.4% among those who experienced non-physical violence reported such changes (Gerberich et al., 2004).

The results from the present study indicate that nurses who experienced physical workplace violence leading to an absence from work are very rare. Thus, we cannot draw any conclusive results regarding the downstream effects of the workplace violence, such as absenteeism, and its relationship on intention to leave. This is a limitation regarding the sample size of the study for this purpose. Other limitations are described in turn. Firstly, being a small component of a large set of data collected from the

cohort member in the baseline survey, some essential data regarding workplace violence and intention to leave were lacking such as organizational factors, types of department or hospitals which could provide specific context of the workplace to deal with the problems. Secondly, it is possible, indeed even likely, that the non-respondents in this study have both higher rate of workplace violence, higher rates of intention to leave, than those that chose to participate in the cohort study. Consequently, the findings presented in this study are likely to underestimate the rates of both intention to leave and workplace violence. However, the response rate of 58.6% in a mailed, self-administered questionnaire survey is not too low. Thirdly, being a cross-sectional study design, a causal association between the workplace violence and an intention to leave cannot be established. The second wave survey of this cohort will allow stronger conclusions in this regard. Nonetheless, this is the first and the largest cohort study in Thailand and in South East Asia. A sample size of 16,814 randomly selected as a nationally representative sample for investigating both the nursing workforce, in particular, and women health, in general, provides strong evidence of an association between the workplace violence and an intention to leave the nursing profession.

In conclusion, the workplace violence is associated with an increasing rate of an intention to leave a nursing career among Thai registered nurses. In particular, non-physical workplace violence was shown to be strongly associated with an intention to leave. Effective measures are needed to minimize workplace violence and prevent nurses from this occupational threat.

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