JAPAN JOURNAL OF NURSING SCIENCE

Japan Journal of Nursing Science (2017) **14**, 49–60 doi:10.1111/jjns.12135

ORIGINAL ARTICLE

Occupational commitment and job satisfaction mediate effort–reward imbalance and the intention to continue nursing

Miho SATOH,[1] Ikue WATANABE[2] and Kyoko ASAKURA[3]

[1]*Faculty of Nursing, Tokyo Health Care University, Tokyo and* [2]*Faculty of Health Sciences, Tohoku Fukushi University and* [3]*Department of Nursing Education and Administration, Graduate School of Medicine, Tohoku University, Sendai, Japan*

Abstract

Aim: Occupational commitment and job satisfaction are major predictors of the intention to continue nursing. This study's purpose was to verify the mediating effects of job satisfaction and three components of occupational commitment on the relationship between effort–reward imbalance and the intention to continue nursing.

Methods: A self-report questionnaire was distributed to 3977 nurses by the nursing department of 12 hospitals in the Tohoku and Kanto districts of Japan in 2013. Of these, 1531 (response rate: 38.5%) nurses returned the questionnaire by mail and the complete data that were provided by 1241 nurses (valid response rate: 31.2%) were analyzed.

Results: Structural equation modeling showed that the effort–reward ratio had negative effects on job satisfaction and affective and normative occupational commitment. Job satisfaction and affective and normative occupational commitment had positive effects on the intention to continue nursing, whereas the effort–reward ratio had no direct effect on the intention to continue nursing. Continuance occupational commitment was not a mediator, but it positively influenced the intention to continue nursing.

Conclusion: The findings suggest that it is important to increase job satisfaction and affective and normative occupational commitment in order to enhance their buffering effects on the relationship between job stress and the intention to continue nursing. Measures to increase continuance occupational commitment also would be an effective method of strengthening the intention to continue nursing. Improvements in these areas should contribute to an increase in nurses' intention to continue nursing and prevent the loss of this precious human resource from the health sector.

Key words: intention to continue, job satisfaction, job stress, nursing turnover, occupational commitment.

INTRODUCTION

It is a global political concern that many nurses intend to leave the nursing profession (World Health Organization, 2011). Recent studies found that ~5–20% of nurses intended to leave the profession in European countries (Hasselhorn *et al.*, 2008; Heinen *et al.*, 2013) and that ~3–16% of nurses in the USA reported an intention to leave the profession (Li, Galatsch, Siegrist, Mueller, & Hasselhorn, 2011; U.S. Department of Health and Human Services, 2010).

In Japan, many nurses leave their occupation for various reasons. Studies that have examined the effect of stressful experiences in the work environment found that psychosocial stress in the work environment influenced nurses' intentions to leave their job (Tominaga & Miki, 2011). Kato and Ozaki (2011) reported that dissatisfaction with work conditions and burnout were negatively associated with the intention to continue working. The intention to leave a job increased in the presence of burnout, accompanied by low self-esteem and low motivation (Furuya & Tani, 2008). Actually,

Correspondence: Miho Satoh, Faculty of Nursing, Tokyo Health Care University, 2-5-1 Higashigaoka, Meguro-ku, Tokyo 152-8558, Japan. Email: miho.sth@gmail.com

Received 14 October 2015; Accepted 10 March 2016.

75.2% of nurses in Japan have reported their intention to leave the profession (The Japan Federation of Medical Workers' Unions, 2014). According to a survey of the Japanese Nursing Association (2015), nurses who wanted to continue working as a nurse comprised 58.1% of the respondents. The remaining respondents consisted of nurses who wanted to do a job they were interested in, whether it was nursing or not (27.8%), those who wanted to do a job other than nursing (1.5%), and those who did not want to work (2.7%).

An increase in the professional turnover rate among nurses has had serious effects on the healthcare system. In the event that an adequate nursing workforce cannot be ensured, a reduction in the quality and safety of patient care, patient satisfaction, and human capital from the nursing workforce will result (Aiken *et al.*, 2012, 2014; O'Brien-Pallas *et al.*, 2006). Moreover, nurses are likely to have high job stress and job dissatisfaction as workloads increase, thereby strengthening their intention to leave the profession (Aiken, Clarke, Sloane, Sochalski, & Silber, 2002; El-Jardali, Dimassi, Dumit, Jamal, & Mouro, 2009; Goh, Lee, Chan, & Chan, 2015; Unruh, Zhang, & Chisolm, 2016). Therefore, developing strategies to increase nurses' intention to continue to work in the profession is an urgent issue.

However, little research on professional turnover intention among nurses has been conducted in order to clarify the mechanisms underlying nurses' professional turnover (Flinkman, Leino-Kilpi, & Salantera, 2010; Simon, Muller, & Hasselhorn, 2010). In addition, the definitions of turnover are inconsistent among studies (Hayes *et al.*, 2006). Many studies on nurses' turnover intentions fail to distinguish between the intention to leave the organization and to leave the profession (Hayes *et al.*, 2006; Simon *et al.*, 2010).

Work-related stress is a critical factor influencing nurses' intention to leave the profession. Nurses are routinely exposed to various kinds of psychosocial stressors, such as long work hours, shift work, emotional exhaustion, and interpersonal stress (Jennings, 2008; Jourdain & Chenevert, 2010). They also are required to develop their abilities and skills, perform a wide range of duties, and assume many responsibilities in order to provide adequate nursing services (Jennings, 2008; Onoda, Uchida, & Tsumoto, 2012).

Employment as a nurse often is emotionally and physically demanding and offers meager rewards, such as a poor salary, meaningless work, and a lack of accomplishment, which lead to higher stress and strain (Li *et al.*, 2011, 2013). These factors give rise to the increase in nurses' turnover. A lack of reciprocity between the efforts that are made at work and the rewards that are received in return, including money, promotion prospects, and esteem, elicits emotional distress. As a result, the intention to leave nursing might increase, a phenomenon that is explained by the effort–reward imbalance (ERI) model (Siegrist, 1996).

The ERI model is suitable for research on job stress in service and professional occupations, such as the health professions (Marmot, Siegrist, & Theorell, 1999). Nurses are exposed to high levels of emotional strain and heavy workloads (Aiken, Sloane, Bruyneel, Van den Heede, & Sermeus, 2013; Montgomery, Spanu, Baban, & Panagopoulou, 2015). A survey of Japanese nurses that was conducted by the Japan Federation of Medical Workers' Union reported that 27.8% experienced feelings of low self-accomplishment, 33.9% were dissatisfied with their salary, and 44.2% complained of a heavy workload (The Japan Federation of Medical Workers' Unions, 2014). According to the *Survey on the Wage of Hospital Nurses*, >50.0% reported inadequate wages and wage increases for higher work demands (Japanese Nursing Association, 2014). Thus, many Japanese nurses face inadequate compensation economically and psychologically and experience an imbalance between the effort they make for their job and the rewards they receive. Tsutsumi *et al.* (2002) reported that the level of ERI among Japanese nurses was almost twice that of production workers. Previous studies of job stress using the ERI model among nurses reported that the imbalance between effort and reward significantly correlated with job satisfaction and professional turnover intention (Derycke *et al.*, 2010; Lavoie-Tremblay, O'Brien-Pallas, Gelinas, Desforges, & Marchionni, 2008).

Job satisfaction and job stress have significant inverse associations with the intention to leave the profession (Wang, Tao, Ellenbecker, & Liu, 2012). Studies have found that job satisfaction is a predictor of the intention to remain in the nursing profession (Cortese, 2012; Laschinger, 2012; Salminen, 2012). Several studies have claimed that job satisfaction has a mediating role in the relationship between job stress and the stress response (Fisher & Locke, 1992; Fried, Shirom, Gilboa, & Cooper, 2008; Tanaka, 1998). Furthermore, job satisfaction was reported to function as a moderator of the relationship between job stress and the turnover intention of nurses (Han & Jekel, 2011; Kuo, Lin, & Li, 2014).

Among the factors that promote nurses' intention to continue to stay in nursing, occupational commitment is one that is worthy of attention. Occupational commitment is defined as the "psychological link between an individual and his/her occupation that is based on an

affective reaction to that occupation" (Lee, Carswell, & Allen, 2000, p. 800). Studies have reported that occupational commitment is negatively associated with the intention to leave the profession (Chang, Chi, & Miao, 2007; Gambino, 2010; Lee *et al.*, 2000; Meyer, Allen, & Smith, 1993; Wang *et al.*, 2012), positively associated with job satisfaction (Meyer *et al.*, 1993; Satoh, Asakura, Watanabe, & Shimojo, 2015), and negatively associated with job stress (Lee *et al.*, 2000; Wang *et al.*, 2012).

Commitment, a component of hardiness, has been conceptualized as a personality characteristic that moderates the relationship between stressful circumstances and stress-related outcomes (Kobasa, 1979). Studies on occupational stress have examined the buffering effect of commitment (Kobasa, Maddi, & Courington, 1981; Kobasa, Maddi, & Kahn, 1982). Several studies have supported the notion that organizational commitment acts as a moderator in the relationship between stress and stress reactions (Begley & Czajka, 1993; Mathieu & Zajac, 1990; Meyer *et al.*, 1993). However, few studies have investigated the moderating role of occupational commitment. Lee *et al.* (2000) concluded that employees with higher occupational commitment are better able to cope with work-related stress. Given these findings (Kobasa; Kobasa *et al.*, 1982; Lee *et al.*, 2000), occupational commitment might moderate the relationship between job stress and stress-related outcomes among professionals.

Although job satisfaction and occupational commitment are major factors that predict the intention to leave the profession, they can be expected to mediate the relationship between job stress and the intention to leave the profession. An examination of the factors that are associated with improving the intention to continue nursing is imperative in order to reduce nurses' intention to leave the profession.

A positive attitude towards one's job and occupation should weaken the relationship between job stress and the stress response. Work motivation and coping resources have been suggested as factors that worsen the effect of an ERI (Siegrist *et al.*, 2004). However, little is known about the mediating variables that reduce the effect of an ERI. Therefore, a hypothetical model was proposed that incorporates job satisfaction and occupational commitment as mediators in the ERI model.

METHODS

Aim

The aim of this study was to examine the mediating effects of job satisfaction and occupational commitment on ERI and the intention to continue nursing. In order to understand the actual factors that are associated with continuing to work in the nursing profession, this study uses the term "intention to continue nursing" in order to distinguish it from "intention to work in the same setting." Figure 1 presents the hypothetical model.

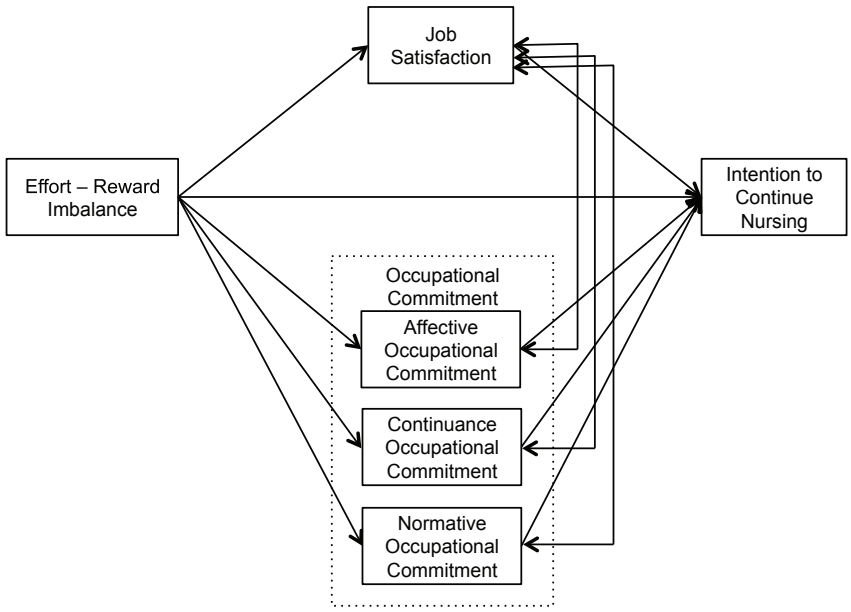

Figure 1 Hypothetical model. The solid black arrows represent the hypothesized relationships.

Research design and participants

A cross-sectional design was adopted. In August 2013, hospitals in the Tohoku and Kanto districts of Japan with >300 beds and a 1:7 nurse–patient ratio were identified. The directors of the nursing departments were asked for their cooperation with this study orally and in writing and 12 hospitals agreed to participate. From September to October 2013, a self-report questionnaire was distributed to 3977 nurses through the nursing departments at the 12 hospitals. Of these, 1531 nurses (response rate: 38.5%) returned the questionnaire by mail. The participants who worked in the hospitals as public health nurses or midwives were excluded because their intention to continue in nursing might have been different from those who worked as staff nurses. As such, the differences in their nursing specialization might have affected their answers to the questionnaire. The data from the completed questionnaires that had been provided by 1241 nurses who worked at the hospitals (valid response rate: 31.2%) were analyzed.

Measures

Effort–reward imbalance

In order to assess stressful conditions at work, the Japanese short version of the Effort–Reward Imbalance Questionnaire (ERI-Q), originally developed by Siegrist and Peter (1996) and Siegrist *et al.* (2004), was used. The Japanese short version of the ERI-Q has been confirmed as having high validity and reliability (Tsutsumi, Ishitake, Peter, Siegrist, & Matoba, 2001; Tsutsumi, Nagami, Morimoto, & Matoba, 2002; Tsutsumi *et al.*, 2002).

The ERI-Q consists of two subscales that measure effort (six items) and reward (11 items). "Effort" refers to job demands, responsibility, and workload. An example of an item is "I have constant time pressure due to a heavy workload." Rewards, such as money, esteem, or career, are the component that workers expect to gain through their labor. Another example of an item is "My job promotion prospects are poor."

Items are answered in two steps. First, the respondents indicate whether each item is a stressful condition by choosing one of two options, "agree" or "disagree." When they answer "agree," they are asked to rate the degree of distress by selecting one of four options, ranging from 1 ("not at all distressed") to 4 ("very distressed").

The effort–reward ratio was calculated as follows: the effort scores and reward scores were multiplied by a correction factor to adjust for the unequal number of items of the two scales (Siegrist & Peter, 1996).

Occupational commitment

In order to assess occupational commitment, the Japanese version of the Occupational Commitment Scale (Satoh *et al.*, 2015), originally developed by Meyer *et al.* (1993), was used. Occupational commitment consists of three components: (i) affective occupational commitment, an affective attachment to an occupation; (ii) continuance occupational commitment, the perceived cost of leaving the occupation; and (iii) normative occupational commitment, an obligation to the occupation. Each subscale consists of six items; respondents rate the items on a scale from 1 ("strongly disagree") to 5 ("strongly agree".) The scores are summed for each scale, with higher scores indicating higher levels of each type of commitment.

Job satisfaction

Job satisfaction was assessed by using a general job satisfaction scale, which is a subscale of the Japanese version of the Job Satisfaction Scale (Tanaka, 1998), originally developed by McLean (1979). The scale includes four items to evaluate the degree of overall satisfaction with various working conditions, such as "Overall, I am satisfied with my current job." The respondents rate the items on a scale from 1 ("strongly disagree") to 5 ("strongly agree") and the scores are summed. Higher scores indicate greater job satisfaction.

Intention to continue nursing

A single-item measure was developed based on a previous study in order to assess the participants' intention to continue nursing (Flinkman *et al.*, 2010). The respondents in this study answered one Likert-type item in order to assess their intention to continue nursing: "How do you feel about continuing to work as a nurse?" The response options were: 1 ("desire to continue working"), 2 ("moderate desire to continue working"), 3 ("moderate desire to leave nursing"), and 4 ("desire to leave nursing").

Demographic variables

Data on individual and work-related variables were collected: sex, age, marital status, number of overtime hours per month, number of years of experience in nursing, and number of beds at this hospital.

Ethical considerations

Approval for this study was obtained from the ethics committee of the authors' institutions (No. 2012-1-603). The cooperation of all of the hospitals' nursing service directors was requested orally and in writing. The participants were informed of the voluntary nature of this study, assured of their right to refuse to participate or withdraw at any time, and assured of the confidentiality of the data. As this study examined the participants' perceptions of working conditions and their intention to leave their job, they were asked to return their questionnaire by mail.

Statistical analyses

Descriptive statistics for the participants' personal and employment characteristics were calculated, as were the descriptive statistics and Cronbach's α for occupational commitment, job satisfaction, and ERI. Pearson's correlation coefficients between the continuous variables also were calculated.

Path analyses were conducted in order to test the hypothetical model (Fig. 1). The participants' sex, total years of experience in nursing, marital status, amount of overtime (h), and hospital location (urban and rural) were used as the control variables. The goodness-of-fit (GFI) was assessed by using χ^2-tests, the adjusted GFI index (AGFI), the comparative fit index (CFI), the root mean square error of approximation (RMSEA), and Akaike's information criterion (AIC).

IBM SPSS Statistics for Mac v. 22.0 and Amos v. 18.0 (IBM Corporation, Armonk, NY) were used for the data analysis. Statistical significance was set at $P < 0.05$ (two-tailed).

RESULTS

Sample characteristics

Of the 1241 nurses in the sample, 95.6% were female and 4.4% were male. The average number of years of experience in nursing was 15.6 years. The participants worked in hospitals with <499 beds (16.7%), 500–699 beds (71.4%), and >700 beds (11.9%). The hospitals were located in urban (17.8%) and rural (19.5%) areas of the Kanto (37.3%) and Tohoku (62.7%) districts; 29.5% of the nurses worked 10–20 h of overtime in the previous month and 13.0% worked >30 h of overtime (see Table 1).

Table 2 shows the descriptive statistics (means, standard deviations, and ranges) and Cronbach's α coefficients for the scales. All of the Cronbach's α coefficients were >0.80, which indicates acceptable reliability.

Table 1 Participants' characteristics (N = 1241)

	N	%
Gender		
Male	54	4.4
Female	1187	95.6
Age: mean (SD)	37.6	(10.3)
Years of experience in nursing: mean (SD)	15.6	(10.3)
Marital status		
Single	584	47.1
Married	657	52.9
Overtime (h/month)		
None	25	2.0
<5 h	169	13.6
5–10 h	286	23.0
10–20 h	366	29.5
20–30 h	234	18.9
>30 h	161	13.0
Number of beds		
300–499 beds	207	16.7
500–699 beds	886	71.4
≥700 beds	148	11.9
Area of the hospitals		
Urban area – Kanto district	221	17.8
Rural area – Kanto district	242	19.5
Tohoku district	778	62.7

SD, standard deviation.

The results of the Pearson's correlations between the variables are reported in Table 3. The highest correlation coefficient with the intention to continue nursing was affective occupational commitment ($r = 0.605$, $P < 0.001$). The effort–reward ratio was negatively correlated with the intention to continue nursing ($r = -0.119$, $P < 0.001$).

Mediation model

The results of the structural equation model are shown in Figure 2. The model provided an adequate fit to the data of this study: χ^2/d.f. = 1.501, AGFI = 0.983, CFI = 0.997, RMSEA = 0.020, and AIC = 171.514.

The effort–reward ratio had negative effects on job satisfaction ($\beta = -0.398$, $P < 0.001$), affective occupational commitment ($\beta = -0.269$, $P < 0.001$), and normative occupational commitment ($\beta = -0.110$, $P < 0.001$). There was no significant relationship between the effort–reward ratio and continuance occupational commitment. Job satisfaction ($\beta = 0.113$, $P < 0.001$), and affective ($\beta = 0.457$, $P < 0.001$), continuance ($\beta = 0.137$,

Table 2 Descriptive statistics and Cronbach's α for the scales

Variable	Mean	SD	Expected range	Observed range	Cronbach's α
Job satisfaction	11.07	3.62	4–20	4–20	0.877
Occupational commitment					
Affective	21.17	3.89	6–30	6–30	0.837
Continuance	17.30	3.61	5–25	5–25	0.759
Normative	17.26	3.85	6–30	6–30	0.765
Intention to continue nursing	3.00	0.82	1–4	1–4	—
Effort	20.71	4.93	6–30	6–30	0.867
Reward	38.34	8.77	11–55	11–55	0.833
Effort–reward ratio	1.70	0.46	0.2–5	0.2–4.09	—

SD, standard deviation.

Table 3 Pearson's correlations between the variables

	(1)	(2)	(3)	(4)	(5)	(6)
(1) Effort/reward ratio	1.000					
(2) Job satisfaction	–0.124***	1.000				
(3) Affective occupational commitment	–0.269***	0.333***	1.000			
(4) Continuance occupational commitment	0.020	0.143***	0.273***	1.000		
(5) Normative occupationa commitment	–0.108***	0.216***	0.444***	0.347***	1.000	
(6) Intention to continue nursing	–0.119***	0.349***	0.605***	0.310***	0.422***	1.000

***$P < 0.001$.

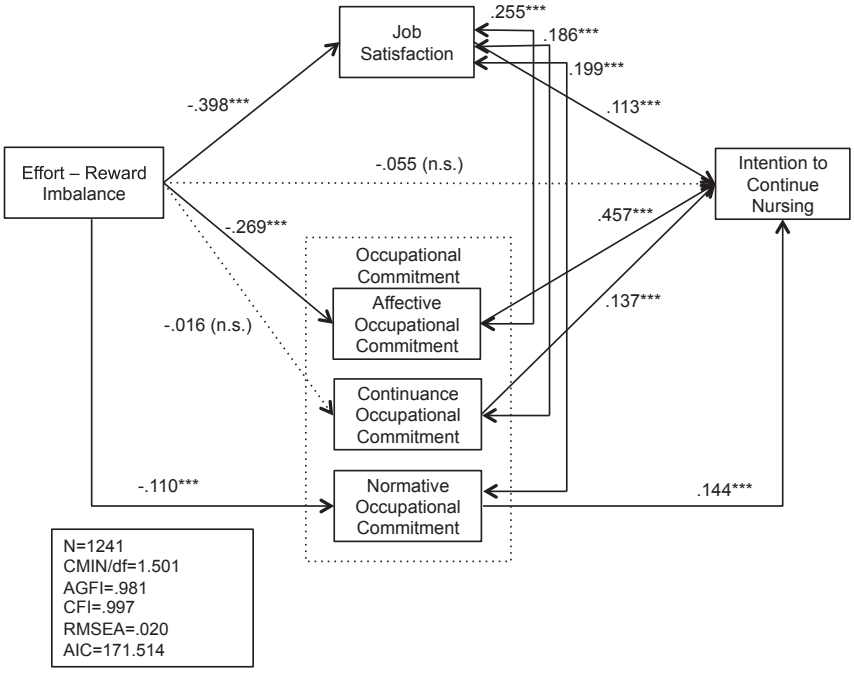

Figure 2 Mediating effects of job satisfaction and the three components of occupational commitment on the relationship between effort–reward imbalance and the intention to continue nursing. The solid black lines and arrows represent significant relationships. The hatched black line and arrow represent the hypothesized relationship that was not statistically significant. Statistical significance at: **$P < 0.01$ and ***$P < 0.001$. AGFI, adjusted goodness-of-fit index; AIC, Akaike's information criterion; CFI, comparative fit index; CMIN, chi-squared value; NS, not significant; RMSEA, root mean square error of approximation.

$P < 0.001$), and normative occupational commitment ($\beta = 0.144$, $P < 0.001$) had positive effects on the intention to continue nursing, whereas the effort–reward ratio had no direct effect on the intention to continue nursing.

DISCUSSION

The mediating effects of occupational commitment and job satisfaction on ERI and the intention to continue

nursing were investigated. Although the recent literature has emphasized the multidimensionality of occupational commitment (Lee *et al.*, 2000; Meyer *et al.*, 1993), many studies have treated occupational commitment as a unidimensional concept (Kanste, 2011; Nesje, 2015) or as affective occupational commitment only (Jourdain & Chenevert, 2010; Laschinger *et al.*, 2013; Van der Heijden, Van Dam, & Hasselhorn, 2009). In this study, three components of occupational commitment were analyzed separately as three observed variables.

The results partially supported the hypothesis. Effort–reward imbalance had no direct effect on the intention to continue nursing, but it had indirect effects on the intention to continue nursing, as its effect was mediated by job satisfaction and affective and normative occupational commitment. Continuance occupational commitment did not mediate the association between job stress and the intention to continue nursing, but it positively influenced the intention to continue nursing.

This study's finding that job satisfaction has a mediating role in the relationship between job stress and professional turnover intent is consistent with previous studies (Kuo *et al.*, 2014; Tanaka, 1998; Zeytinoglu *et al.*, 2007). Job satisfaction depends on the degree of disparity between the reward that an employee actually receives and the reward that is expected (Porter & Steers, 1973). The current study indicated that lower-than-expected psychological or economic rewards for one's efforts might lead to job dissatisfaction, but that the effect of ERI on the intention to continue nursing can be diminished by the mediating effect of higher job satisfaction.

Affective and normative occupational commitment were negatively influenced by ERI and these results support those of previous studies (Barbier, Peters, & Hansez, 2009; Meyer *et al.*, 1993). Affective occupational commitment is thought to be strongly influenced by stress. The imbalance between effort and reward is seen in the lack of appropriate rewards; as a result, such imbalances become triggers for feeling stressed due to work (Siegrist & Peter, 1996; Siegrist *et al.*, 2004). The fewer imbalances that exist between effort and reward, the higher a person's emotional commitment to an occupation will be because he or she might appreciate the significance of the occupation.

Normative occupational commitment is slightly different from affective occupational commitment. However, both the normative and affective types of occupational commitment have moderate positive correlations, as these components are thought to be similar concepts (Irving, Coleman, & Cooper, 1997; Lee *et al.*, 2000; Meyer *et al.*, 1993). Therefore, ERI also negatively affected normative commitment. Nurses with high normative occupational commitment experience satisfaction with fulfilling their obligations and responsibilities, which might explain this study's finding of a negative association between ERI and normative occupational commitment.

Continuance occupational commitment had no significant relationship with ERI and this result is consistent with several studies that were conducted with hospital nurses (Somers, 2009), call center staff (Wegge, van Dick, Fisher, West, & Dawson, 2006), and service-sector workers (Barbier *et al.*, 2009). According to a research review by Meyer and Allen (1997), the correlations between continuance commitment and stress were not significant. The association between continuance commitment and affective and normative commitment was weak (Meyer *et al.*, 1993). Thus, continuance occupational commitment has the same significance to the nursing profession as affective and normative commitment, but it might be slightly different from the other forms of commitment. This study indicated that nurses' continuance occupational commitment was less likely to be affected by job stress prior to their desire to avoid the perceived costs, lack of alternatives, and other consequences that are associated with leaving the profession, as they had accumulated knowledge, skills, and experience as nursing professionals. However, the finding that continuance occupational commitment was a significant predictor of the intention to continue nursing was consistent with Meyer and Allen's theory and with previous research (Nogueras, 2006).

At the same time, it is suggested that affective and normative occupational commitment reduce the adverse effects of job stress on the psychological responses to stress, such as occupational turnover intention. Previous studies have reported that occupational commitment has a negative association with burnout and depressive symptoms (Lee *et al.*, 2000; Sawada, 2009). Kobasa argued that commitment functions as a buffer against occupational stress (Kobasa, 1979; Kobasa *et al.*, 1981, 1982). Thus, commitment is regarded as a significant resource of an individual because of its stress-buffering effect.

Organizational commitment has been found to buffer job stress and to reduce the intention to leave the organization (Han, Han, An, & Lim, 2015; Schmidt, 2007; Schmidt & Diestel, 2012). Work engagement and professional commitment, which are similar to

occupational commitment, have been found to function as moderators of job stress and turnover intention (Peng, Lee, & Tseng, 2014; Teng, Shyu, & Chang, 2007). However, few studies have been conducted on the buffering effect of occupational commitment against stress and turnover intention. The present study revealed that affective and normative occupational commitment were significant mediators of the association between job stress and the intention to continue nursing.

Not much research is available on the effects of the three components of occupational commitment on job stress and the intention to continue nursing and the mediating effect of occupational commitment on the relationship between job stress and the intention to continue nursing or turnover intention in Japan. This study's findings were partially consistent with some of the results of international studies (Meyer & Allen, 1997; Peng *et al.*, 2014; Somers, 2009; Teng *et al.*, 2007). However, further studies are needed to confirm the buffering effect of occupational commitment against stress and turnover intention and the unique effect of the three components on the relationship between job stress and the intention to continue nursing.

Limitations of the study

The data were collected only from nurses in the eastern region of Japan; therefore, further studies are needed in order to determine whether these findings can be generalized to nurses in other areas. In addition, the low response rate to the survey is likely to affect the ability to generalize the results of this study. As the findings are based on data from a cross-sectional design, data from a longitudinal survey are needed to infer causal effects. Finally, multiple factors are simultaneously associated with the intention to leave the profession. Thus, future studies are needed to investigate the relationship between the intention to leave the profession and individual- (e.g. age, family, and education) or employment-related variables (e.g. shift work, employment contract, and position).

Implications for practice

The intention to continue nursing was found to be indirectly influenced by ERI in the present study, a finding that is supported by previous research (Derycke *et al.*, 2010; Lavoie-Tremblay *et al.*, 2008; Tominaga & Miki, 2011). A strategy is needed to correct the imbalance between effort and reward. For example, organizations and nurse managers need to address ERI by implementing measures to reduce the nursing staff's workload and by appropriately acknowledging the nursing staff's efforts and achievements. These measures are also effective for improving occupational commitment and job satisfaction.

This study's results support the importance of developing strategies to increase nurses' job satisfaction and affective and normative commitment in order to decrease the adverse effects of job stress on their intention to continue nursing. Cognitive appraisal of a stressor mediates the relationship between the stressor and the stress response (Lazarus & Folkman, 1984). If a stressor is appraised as threatening, a negative stress reaction would be expected to occur. Individual resources, such as beliefs and values, are involved in the cognitive appraisal process (Kobasa, 1979; Kobasa *et al.*, 1982). This study suggests that the mediating effects of job satisfaction and affective and normative occupational commitment are related to the cognitive appraisal of stressors.

An organization should attempt to implement interventions that improve affective and normative occupational commitment. It would be helpful to provide opportunities for the nursing staff to describe their job experiences and share them with each other in order to increase their feelings of pride in being nurses, their awareness of the significance of nursing, and a sense of the meaningfulness of their job as a professional nurse.

Although continuance occupational commitment did not mediate the relationship between ERI and the intention to continue nursing, it was found to be a significant factor in increasing the intention to continue nursing. Nurse managers should rethink their job evaluation and/or job promotion systems, which nurses refer to when they invest their effort in jobs; then, their nurses should have a better chance of gaining economic and psychological rewards in return. In addition to income security and job security, improvements in the work environment that support professional self-improvement (e.g. continuing education programs to develop nursing knowledge and skills) are needed to promote continuance occupational commitment.

The approach to each component is not only crucial to the improvement of occupational commitment, but also to reaffirming the meaning and significance of nursing activities and the motivation to work, thereby increasing job satisfaction and fulfillment.

However, there is a dearth of studies that clarify the factors that affect each component of occupational commitment and the buffering effect of each component against stress and professional turnover intention. Future studies are required to investigate the determinants and buffering effects of each component of occupational commitment.

CONCLUSION

This study confirmed that affective and normative occupational commitment and job satisfaction fully mediate the effect of ERI on the intention to continue hospital nursing in the Tohoku and Kanto districts of Japan. However, continuance occupational commitment did not mediate the association between ERI and the intention to continue nursing, but it did increase the intention to continue nursing. This finding suggests that interventions are needed to improve affective and normative occupational commitment and job satisfaction, so that these two variables function effectively in order to mediate the relationship between job stress and the intention to continue nursing. Measures to increase continuance occupational commitment might be an effective way to strengthen the intention to continue nursing and should prevent the loss of this precious human resource from the health sector.

ACKNOWLEDGMENTS

We are deeply grateful to the participants of this study and the facility's staff who cooperated with us in conducting the data collection. This study was supported by a Grant-in-Aid for Scientific Research (C) (No. 23593122) and the Health Care Science Institute, Tokyo, Japan.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

AUTHOR CONTRIBUTIONS

M. S., I. W., and K. A. contributed to the concept and design of this study and data collection; M. S. carried out the statistical analysis, drafted the manuscript, and finished the manuscript; I. W. and K. A. critically reviewed the manuscript; all the authors read and approved the final manuscript.

REFERENCES

Aiken, L., Clarke, S. P., Sloane, D. M., Sochalski, J. & Silber, J. H. (2002). Hospital nurse staffing and patient mortality, nurse burnout, and job dissatisfaction. *Journal of the American Medical Association*, *288*, 1987–1993.

Aiken, L., Sermeus, W., Van den Heede, K., Sloane, D. M., Busse, R., McKee, M. *et al.* (2012). Patient safety, satisfaction, and quality of hospital care: Cross sectional surveys of nurses and patients in 12 countries in Europe and the United States. *British Medical Journal*, *344*, e1717.

Aiken, L., Sloane, D. M., Bruyneel, L., Van den Heede, K., Griffiths, P., Busse, R. *et al.* (2014). Nurse staffing and education and hospital mortality in nine European countries: A retrospective observational study. *The Lancet*, *383*, 1824–1830.

Aiken, L., Sloane, D. M., Bruyneel, L., Van den Heede, K. & Sermeus, W. (2013). Nurses' reports of working conditions and hospital quality of care in 12 countries in Europe. *International Journal of Nursing Studies*, *50*, 143–153.

Barbier, M., Peters, S. & Hansez, I. (2009). Measuring positive and negative occupational states (PNOSI): Structural confirmation of a new Belgian tool. *Psychologica Belgica*, *49*, 227–247.

Begley, T. M. & Czajka, J. M. (1993). Panel analysis of the moderating effects of commitment on job satisfaction, intent to quit, and health following organizational change. *Journal of Applied Psychology*, *78*, 552–556.

Chang, H. T., Chi, N. & Miao, M. (2007). Testing the relationship between three-component organizational/occupational commitment and organizational/occupational turnover intention using a non-recursive model. *Journal of Vocational Behaviour*, *70*, 352–368.

Cortese, C. G. (2012). Predictors of critical care nurses' intention to leave the unit, the hospital, and the nursing profession. *Open Journal of Nursing*, *2*, 311–326.

Derycke, H., Vlerick, P., Burnay, N., Decleire, C., D'Hoore, W., Hasselhorn, H. M. *et al.* (2010). Impact of the effort–reward imbalance model on intent to leave among Belgian health care workers: A prospective study. *Journal of Occupational and Organizational Psychology*, *83*, 879–893.

El-Jardali, F., Dimassi, H., Dumit, N., Jamal, D. & Mouro, G. (2009). A national cross-sectional study on nurses' intent to leave and job satisfaction in Lebanon: Implications for policy and practice. *BMC Nursing*, *8*, 3.

Fisher, C. D. & Locke, E. A. (1992). The new look in job satisfaction research and theory. In: C. J. Cranny, P. C. Smith & E. F. Stone (Eds), *Job satisfaction* (pp. 165–194). New York: Lexington.

Flinkman, M., Leino-Kilpi, H. & Salantera, S. (2010). Nurses' intention to leave the profession: Integrative review. *Journal of Advanced Nursing*, *66*, 1422–1434.

Fried, Y., Shirom, A., Gilboa, S. & Cooper, C. L. (2008). The mediating effects of job satisfaction and propensity to leave on role stress–job performance relationships: Combining meta-analysis and structural equation modeling. *International Journal of Stress Management*, *15*, 305–328.

Furuya, H. & Tani, F. (2008). The burnout process model from the occurrence through intention to quit among nurses. *Japan Academy of Nursing Science*, *28*, 55–61 (in Japanese).

Gambino, K. M. (2010). Motivation for entry, occupational commitment and intent to remain: A survey regarding registered nurse retention. *Journal of Advanced Nursing*, *66*, 2532–2541.

Goh, Y. S., Lee, A., Chan, S. W. C. & Chan, M. F. (2015). Profiling nurses' job satisfaction, acculturation, work environment, stress, cultural values and coping abilities: A cluster analysis. *Journal of Nursing Practice*, *21*, 443–452.

Han, G. H. & Jekel, M. (2011). The mediating role of job satisfaction between leader–member exchange and turnover intentions. *Journal of Nursing Management*, *19*, 41–49.

Han, S. S., Han, J. W., An, Y. S. & Lim, S. H. (2015). Effects of role stress on nurses' turnover intentions: The mediating effects of organizational commitment and burnout. *Japan Journal of Nursing Science*, *12*, 287–296.

Hasselhorn, H. M., Conway, P. M., Widerszal-Bazyl, M., Simon, M., Tackenberg, P., Schmidt, S. *et al.* (2008). Contribution of job strain to nurses' consideration of leaving the profession–Results from the longitudinal European nurses' early exit study. *Scandinavian Journal of Work, Environment & Health*, *6*, 75–82.

Hayes, L. J., O'Brien-Pallas, L., Duffield, C., Shamian, J., Buchan, J., Hughes, F. *et al.* (2006). Nurse turnover: A literature review. *International Journal of Nursing Studies*, *43*, 237–263.

Heinen, M. M., van Achterberg, T., Schwendimann, R., Zander, B., Matthews, A., Kozka, M. *et al.* (2013). Nurses' intention to leave their profession: A cross sectional observational study in 10 European countries. *International Journal of Nursing Studies*, *50*, 174–184.

Irving, P. G., Coleman, D. F. & Cooper, C. L. (1997). Further assessments of a three-component model of occupational commitment: Generalizability and differences across occupations. *Journal of Applied Psychology*, *82*, 444–452.

Japanese Nursing Association. (2014). Survey on the wage of hospital nurses 2012. [Cited 10 Dec 2015.] Available from URL: http://www.nurse.or.jp/nursing/practice/shuroanzen/wage/pdf/wage_report_2012.pdf (in Japanese).

Japanese Nursing Association. (2015). Survey on the demand and supply of hospital nurses 2014. [Cited 18 Sep 2015.] Available from URL: http://www.nurse.or.jp/up_pdf/20150331145508_f.pdf (in Japanese).

Jennings, B. M. (2008). Work stress and burnout among nurses: Role of the work environment and working conditions. In: R. G. Hughes (Ed.), *Patient safety and quality: An evidence-based handbook for nurses*. [Cited 22 Sep 2015.] Available from URL: http://archive.ahrq.gov/professionals/clinicians-providers/resources/nursing/resources/nurseshdbk/nurseshdbk.pdf.

Jourdain, G. & Chenevert, D. (2010). Job demands–resources, burnout and intention to leave the nursing profession: A questionnaire survey. *International Journal of Nursing Studies*, *47*, 709–722.

Kanste, O. (2011). Work engagement, work commitment and their association with well-being in health care. *Scandinavian Journal of Caring Sciences*, *25*, 754–761.

Kato, E. & Ozaki, F. (2011). Study of related factors among job-continuing intention, job satisfaction and burnout for nurses in mid-career. *Japan Academy of Nursing Administration and Policies*, *15*, 47–56 (in Japanese).

Kobasa, S. C. (1979). Stressful life events, personality, and health: An inquiry into hardiness. *Journal of Personality and Social Psychology*, *37*, 1–11.

Kobasa, S. C., Maddi, S. R. & Courington, S. (1981). Personality and constitution as mediators in the stress–illness relationship. *Journal of Health and Social Behavior*, *22*, 368–378.

Kobasa, S. C., Maddi, S. R. & Kahn, S. (1982). Hardiness and health: A prospective study. *Journal of Personality and Social Psychology*, *42*, 168–177.

Kuo, H. T., Lin, K. C. & Li, I. C. (2014). The mediating effects of job satisfaction on turnover intention for long-term care nurses in Taiwan. *Journal of Nursing Management*, *22*, 225–233.

Laschinger, H. K. S. (2012). Job and career satisfaction and turnover intentions of newly graduated nurses. *Journal of Nursing Management*, *20*, 472–484.

Laschinger, H. K. S., Wong, C. A., Macdonald-Rencz, S., Burkoski, V., Cummings, G., D'Amour, D. *et al.* (2013). The influence of personal and situational predictors on nurses' aspirations to management roles: Preliminary findings of a national survey of Canadian nurses. *Journal of Nursing Management*, *21*, 217–230.

Lavoie-Tremblay, M., O'Brien-Pallas, L., Gelinas, C., Desforges, N. & Marchionni, C. (2008). Addressing the turnover issue among new nurses from a generational viewpoint. *Journal of Nursing Management*, *16*, 724–733.

Lazarus, R. S. & Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer.

Lee, K., Carswell, J. J. & Allen, N. J. (2000). A meta-analytic review of occupational commitment: Relations with person- and work-related variables. *Journal of Applied Psychology*, *85*, 799–811.

Li, J., Galatsch, M., Siegrist, J., Mueller, B. H. & Hasselhorn, H. M. (2011). Reward frustration at work and intention to leave the nursing profession–prospective results from the European longitudinal NEXT study. *International Journal of Nursing Studies*, *48*, 628–635.

Li, J., Shang, L., Galatsch, M., Siegrist, J., Mueller, B. H. & Hasselhorn, H. M. (2013). Psychological work environment and intention to leave the nursing profession: A cross-national prospective study of eight countries. *International Journal of Health Services*, *43*, 519–523.

McLean, A. A. (1979). *Work stress*. Boston, MA: Addison-Wesley.

Marmot, M., Siegrist, J. & Theorell, T. (1999). Health and the psychosocial environment at work. In: M. Marmot & R. Wilkinson (Eds), *Social determinants of health* (pp. 105–131). Oxford: Oxford University Press.

Mathieu, J. E. & Zajac, D. M. (1990). A review and meta-analysis of the antecedents, correlates, and consequences of organizational commitment. *Psychological Bulletin*, *108*, 171–194.

Meyer, J. P. & Allen, N. J. (1997). *Commitment in the workplace*. London: Sage.

Meyer, J. P., Allen, N. J. & Smith, C. A. (1993). Commitment to organizations and occupations: Extension and test of a three-component conceptualization. *Journal of Applied Psychology*, *78*, 538–551.

Montgomery, A., Spanu, F., Baban, A. & Panagopoulou, E. (2015). Job demands, burnout, and engagement among nurses: A multi-level analysis of ORCAB data investigating the moderating effect of teamwork. *Burnout Research*, *2*, 71–79.

Nesje, K. (2015). Nursing students' prosocial motivation: Does it predict professional commitment and involvement in the job? *Journal of Advanced Nursing*, *71*, 115–125.

Nogueras, D. J. (2006). Occupational commitment, education, and experience as a predictor of intent to leave the nursing profession. *Nursing Economics*, *24*, 86–93.

O'Brien-Pallas, L., Griffin, P., Shamian, J., Buchan, J., Duffield, C., Hughes, F. *et al.* (2006). The impact of nurse turnover on patient, nurse, and system outcomes: A pilot study and focus for multicenter international study. *Policy, Politics, & Nursing Practice*, *7*, 169–179.

Onoda, M., Uchida, H. & Tsumoto, Y. (2012). Longitudinal study on newly graduated nurses' adjustment to the workplace and factors that exert an influence. *The Journal of the Japan Academy of Nursing Administration and Policies*, *16*, 13–23 (in Japanese).

Peng, J. C., Lee, Y. L. & Tseng, M. M. (2014). Person–organization fit and turnover intention: Exploring the mediating effect of work engagement and the moderating effect of demand–ability fit. *Journal of Nursing Research*, *22*, 1–11.

Porter, L. W. & Steers, R. M. (1973). Organizational, work, and personal factors in employee turnover and absenteeism. *Psychological Bulletin*, *80*, 151–176.

Salminen, H. M. (2012). Turning the tide: Registered nurses' job withdrawal intentions in a Finnish university hospital. *SA Journal of Human Resource Management*, *10*, 1–11.

Satoh, M., Asakura, K., Watanabe, I. & Shimojo, Y. (2015). Reliability and validity of the Japanese version of the Occupational Commitment Scale. *Journal of Japan Academy of Nursing Science*, *35*, 63–71 (in Japanese).

Sawada, T. (2009). The relationship of occupational and organizational commitment with professional activities and burnout tendencies in nurses. *The Japanese Journal of Psychology*, *80*, 131–137 (in Japanese).

Schmidt, K. H. (2007). Organizational commitment: A further moderator in the relationship between work stress and strain? *International Journal of Stress Management*, *14*, 26–40.

Schmidt, K. H. & Diestel, S. (2012). The relation of self-control demands to job strain: The moderating role of organisational commitment. *Applied Psychology*, *61*, 479–497.

Siegrist, J. (1996). Adverse health effects of high-effort/low-reward conditions. *Journal of Occupational Health Psychology*, *1*, 27–41.

Siegrist, J. & Peter, R. (1996). *Measuring effort–reward imbalance at work: Guidelines*. Dusseldorf: Heinrich Heine University.

Siegrist, J., Starke, D., Chandola, T., Godin, I., Marmot, M., Niedhammer, I. *et al.* (2004). The measurement of effort–reward imbalance at work: European comparisons. *Social Science & Medicine*, *58*, 1483–1499.

Simon, M., Muller, B. H. & Hasselhorn, H. M. (2010). Leaving the organization or the profession–a multilevel analysis of nurses' intentions. *Journal of Advanced Nursing*, *66*, 616–626.

Somers, M. J. (2009). The combined influence of affective, continuance and normative commitment on employee withdrawal. *Journal of Vocational Behavior*, *74*, 75–81.

Tanaka, M. (1998). A study on the factors of job satisfaction and its scale. *Waseda Psychological Reports*, *30*, 29–36 (in Japanese).

Teng, C. I., Shyu, Y. I. L. & Chang, H. Y. (2007). Moderating effects of professional commitment on hospital nurses in Taiwan. *Journal of Professional Nursing*, *23*, 47–54.

The Japan Federation of Medical Workers' Unions. (2014). A nationwide survey of workers in the nursing field in Japan. [Cited 22 Sep 2015.] Available from URL: http://irouren.or.jp/research/労働実態調査.pdf (in Japanese).

Tominaga, M. & Miki, A. (2011). Factors associated with the intention to leave among newly graduated nurses in advanced-treatment hospitals in Japan. *Japan Journal of Nursing Science*, *8*, 33–46.

Tsutsumi, A., Ishitake, T., Peter, R., Siegrist, J. & Matoba, T. (2001). The Japanese version of the effort–reward Imbalance Questionnaire: A study in dental technicians. *Work & Stress*, *15*, 86–96.

Tsutsumi, A., Kayaba, K., Nagami, M., Miki, A., Kawano, Y., Ohya, Y. *et al.* (2002). The effort–reward imbalance model: Experience in Japanese working population. *Journal of Occupational Health*, *44*, 398–407.

Tsutsumi, A., Nagami, M., Morimoto, K. & Matoba, T. (2002). Responsiveness of measures in the effort–reward imbalance questionnaire to organizational changes: A validation study. *Journal of Psychosomatic Research*, *52*, 249–256.

Unruh, L., Zhang, N. J. & Chisolm, L. (2016). Job and professional leaving among newly licensed RNs. *Western Journal of Nursing Research*, *38*, 5–26.

U.S. Department of Health and Human Services, Health Resources and Services Administration. (2010). The registered nurse population: Findings from the 2008 National Sample Survey of Registered Nurses. [Cited 18 Sep 2015.] Available from URL: http://bhpr.hrsa.gov/healthworkforce/rnsurveys/rnsurveyfinal.pdf

Van der Heijden, B. I. J. M., Van Dam, K. & Hasselhorn, H. M. (2009). Intention to leave nursing: The importance of interpersonal work context, work–home interference, and job satisfaction beyond the effect of occupational commitment. *Career Development International*, *14*, 616–635.

Wang, L., Tao, H., Ellenbecker, C. H. & Liu, X. (2012). Job satisfaction, occupational commitment and intent to stay among Chinese nurses: A cross-sectional questionnaire survey. *Journal of Advanced Nursing*, *68*, 539–549.

Wegge, J., van Dick, R., Fisher, G. K., West, M. A. & Dawson, J. F. (2006). A test of basic assumptions of affective events theory (AET) in call centre work. *British Journal of Management*, *17*, 237–254.

World Health Organization. (2011). Nursing and midwifery services strategic directions 2011–2015. [Cited 22 Sep 2015.] Available from URL: http://whqlibdoc.who.int/hq/2010/WHO_HRH_HPN_10.1_eng.pdf

Zeytinoglu, I. U., Denton, M., Davies, S., Bauman, A., Blythe, J. & Boos, L. (2007). Deteriorated external work environment, heavy workload and nurses' job satisfaction and turnover intention. *Canadian Public Policy*, *33*, S31–S47.

