



RESEARCH ARTICLE

A causal model on assertiveness, stress coping, and workplace environment: Factors affecting novice nurses' burnout

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Funding information

Ministry of Education Science Culture & Sports, Grant/Award Number: 15K11560

Abstract

Aim: This study aimed to develop and test a causal model focused on assertiveness, stress coping, and workplace environment as factors affecting burnout among novice nurses.

Design: Cross-sectional study was conducted with novice nurses of 17 hospitals.

Methods: The Novice Nurse Assertiveness Scale and the Japanese version of Maslach Burnout Inventory.

Results: Data from 645 female novice nurses were analysed. The mean age, Novice Nurse Assertiveness Scale and Maslach Burnout Inventory were 22.6 ± 3.0 , 67.4 ± 10.3 and 13.7 ± 2.5 . For the final model, the study adopted a model that includes indirect influences; inappropriate assertiveness and inappropriate coping affected the dissatisfaction with the job and then affected the burnout. The goodness of fit index was GFI = 0.94, AGFI = 0.91, RMSEA = 0.66, and R^2 was .86. The findings validated this as a causal model of assertiveness, stress coping, and the work environment as factors affecting burnout for novice nurses.

KEYWORDS

assertiveness, burnout, causal model, novice nurse, stress coping, workplace environment

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1 | INTRODUCTION

While the burnout of nurses has become a social problem, and as it is reported that it is more common for nurses to be afflicted by burnout at younger ages (Ahola, et al., 2008; Suzuki et al., 2003; Wu et al., 2006), there is an increasing number of studies of the burnout of novice nurses (nurses newly graduated and in the first job as a nurse) to suggest the need for support measures for novice nurses.

1.1 | Background

Among the factors related to burnout among novice nurses, personal factors such as assertiveness (Suzuki et al., 2007) and stress coping (Suzuki, 2006a), and also workplace factors such as support of a senior nurse (Suzuki, Itomine, et al., 2006), failure in doing assignments, and dissatisfaction with the job and workplace (Takaoka & Katsuki, 2013), Work-life interference (Boamah & Laschinger, 2016), and short-staffing (Boamah et al., 2017) were reported. Burnout is a psychological syndrome of exhaustion, cynicism, and inefficacy, which is experienced due to chronic job stressors in otherwise psychologically healthy individuals (Leiter & Maslach, 2004).

Karasek (1979) defines that "Job dissatisfaction is a result of a disturbance in the equilibrium between the demands that employees are exposed to and the resources". Previous studies report that job dissatisfaction and job satisfaction (Kalliath & Morris, 2002; Khamisa et al., 2015), workload (Fong, 1993; Suzuki et al., 2003; Wu et al., 2006), job strain (Kitaoka-Higashiguchi & Nakagaw, 2003), and dissatisfaction with the workplace (Suzuki et al., 2008) affect burnout.

About stress coping, Lazarus and Folkman (1984) reported that the stress reaction is caused by the imbalance between the stressor and the coping resources, if there is the ability to cope, excessive stress will not become a problem (Labrague et al., 2018). Steptoe (1991) advocates links between stress and illness models. One level of stress does not necessarily lead to a particular disease, and stress intensity and susceptibility to a disease are not necessarily correlated. Steptoe (1991) concludes that this difference is due to coping with the stressor. For burnout, it has been shown that stress coping prevents burnout (Chang & Chan, 2015; Kitaoka-Higashiguchi & Nakagaw, 2003; Simoni & Paterson, 1997; Suzuki, Itomine, et al., 2006, Suzuki, Kanoya, et al., 2006).

Assertive behaviour represents actively giving expression of own rights, thoughts, and feelings without denying the rights of others (Alberti & Emmons, 1986). The authors of this present report have focused on novice nurses and the relationship between assertiveness, which is a personal factor, and burnout, and conducted the research reported in the following. The authors identified the relationship between the level of assertiveness and the incidence of burnout in novice nurses, and noted that novice nurses tend to develop burnout easily when their assertiveness scores are very low or very high (Suzuki, Kanoya, et al., 2006). A relationship between stress coping, satisfaction with the workplace, and burnout was also identified (Suzuki et al., 2008).

However, although assertiveness, stress coping, and the degree of satisfaction with the workplace were reported to be related to burnout (Suzuki et al., 2008; Suzuki et al., 2018) the previous studies, and the data were analysed by multiple regression analysis. Therefore, the relationship between assertiveness, stress coping, and the satisfaction with the workplace that are explanatory variables for burnout, and how these variables affect each other and burnout has not been demonstrated. It was hypothesized that if these aspects are elucidated by a covariance structure analysis, it would be effective to provide assertiveness training, instruction to effect stress coping, and support measures to improve the satisfaction with the workplace.

The point of departure for several models used in the job stress literature is that strain or stress is the result of a disturbance in the equilibrium between the demands that employees are exposed to and the resources that they have at their disposal. For example, according to the well-known and influential demands-control model (DCM; Karasek, 1979), job stress is particularly caused by a combination of heavy job demands (work overload and time pressure) and low job control. The NIOHS (National Institute of Occupational Health and Safety) Occupational Stress Model (Hurrell & McLaney, 1988) lists work stress factors (work contortion, physical and physical chemical environmental shift work) as factors that affect the acute stress response of workers, but factors that adjust the relationship between the two are factors such as individual factors (age, gender, marital status, occupation, etc.), and buffer factors (superiors, colleagues, and occupation) along with family support, factors outside work (family/family requirements) are also pointed out.

In the present study, based on the NIOSH Occupational Stress Model, the authors have aimed to create a causal model for burnout incorporating assertiveness, stress coping, and workplace environment among novice nurses, and to verify the effectiveness of the model.

1.2 | Research question

Can burnout in novice nurses be prevented if stress coping, assertiveness, and workplace dissatisfaction is improved?

2 | METHODS

2.1 | Research design

This study is a cross-sectional (Fukutomi & Hashimoto, 2014) study.

2.2 | Study population and survey

2.2.1 | Participating hospitals and nurses

The authors obtained cooperation from the directors at 12 university hospitals and their affiliated hospitals as well as 5 national hospitals in the Kanto and Tokai regions. These hospitals are general

hospitals, which do not employ associate nurses, have more than 400 beds, and their adjunct hospitals have similar types of care, patients, and workloads. During a three-month period from September to November 2015, a self-administered questionnaire was provided to 1,285 novice full-time nurses who had begun work, newly graduated, as newly employed nurses in 2015.

2.3 | Conceptual framework

In the study, based on the NIOSH (National Institute of Occupational Safety and Health) Occupational Stress Model, for the development of a causal model of burnout, assertiveness, work environment, and stress coping were selected as the factors influencing burnout (Figure 1).

2.4 | Measurements

The study involved measuring the workplace environment and stress coping based on several different aspects.

2.4.1 | Nurse attributes

Information was collected on gender, age, final academic background (vocational nursing school, nursing college, nursing university, college or university degree other than nursing), specialization (general nursing, public health or maternity).

2.4.2 | Burnout

The authors used the Japanese version of the MBI-Human Services Survey (MBI-HSS) designed for medical professionals,

which was described and verified for reliability and validity by Higashiguchi et al. (1998) (Higashiguchi et al., 1998). The original scale developed by Maslach and Jackson (1981) consists of three subscales, and Higashiguchi reported a three-factor structure somewhat different from the original MBI: (a) physical exhaustion; (b) emotional exhaustion and depersonalization; and (c) personal accomplishment. The higher the scores in subscales (a) or (b), as well as the lower the score in subscale (c), the more serious the burnout. Suzuki et al. (2004) assessed the reliability and practicality of rating the frequency of 22 of the 25 items. This study followed the format of Suzuki et al. (2004) immediately above. In accordance with Higashiguchi et al. (1998), three factors were extracted by factor analysis in that study, and the Cronbach's α coefficients were .77–.80. Grading seven scores from 0–6 points and dividing the total score by the number of questions determined the score for each subscale. In addition, the total MBI-HSS score was calculated based on the method proposed by Lewiston et al. (1981): (mean score of physical exhaustion + mean score of depersonalization/emotional exhaustion – mean score of personal accomplishment + 10). The higher the total score, the more serious the burnout. The scale scores range from 4 (least burnout)–22 (most serious burnout). In measuring burnout with the MBI-HSS, some studies have used only physical exhaustion (Aiken et al., 2002; Bourbonnais et al., 1998). However, in previous studies comparing burnout scores of nurses retiring early (after shorter periods of employment) and non-retirees, the early retirees had significantly higher total MBI-HSS and physical exhaustion scores (Suzuki, Kanoya, et al., 2006). The total MBI-HSS score was used because it reflects the concept of burnout. However, the authors performed the covariance structure analysis by using each of the subscale scores without using the total score. The total score was used only for the multiple regression analysis performed to select the explanatory variables for creating a causal model. Permission to use the MBI which is copyrighted was obtained from Mind Garden (2018).

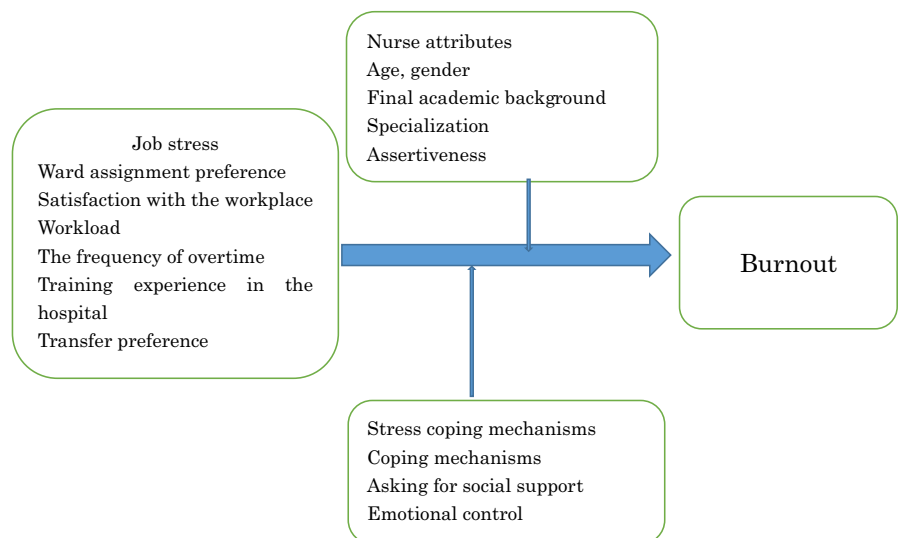


FIGURE 1 Conceptual framework for this study

2.4.3 | Assertiveness

The authors used the Novice Nurse Assertiveness Scale (NNAS) (Suzuki et al., 2017), the reliability (Cronbach's α : .81) and validity (fitness: GFI = 0.929, AGFI = 0.905, RMSEA = 0.065 ($p < .01$)) of which has been verified (Suzuki et al., 2017). Higher NNAS scores indicate "silent self-expression". Lower scores indicate "overwhelming self-expression". The scale ranges from 16–96. Three factors were extracted in a factor analysis. Subscales are comprised of the following three factors: "accept improper evaluations", "non-assertive", and "unresponsive or aggressive".

2.4.4 | Workplace environment

Ward assignment preference

For ward assignment preference, participants were asked about the degree to which their assignments matched the wards of their preference, with the response choices "satisfied to be assigned to the ward of choice", "satisfied despite being assigned to a different ward", "dissatisfied despite being assigned to the ward of choice", or "dissatisfied about being assigned to a different ward".

Satisfaction with the workplace and workload, and the frequency of overtime and training experience in the hospital

Satisfaction levels with the workplace and workload were measured using a Visual Analogue Scale (VAS), assigning 0 for "Not at all" and 100 for "Definitely yes" to the questions "I'm satisfied with the workplace" and "I think my workload is heavy".

2.4.5 | Transfer preference

For wishes to transfer, the participants were asked if they wanted to change their career path, with choices of "no", "want to get a higher degree", "want to change workplace" or "want to find another career".

2.4.6 | Stress coping mechanisms

Coping mechanisms

Questions about coping mechanisms were prepared based on the coping taxonomy developed by Pine and Kafry (1982). The participants were asked, "When you experience difficulties, concerns or problems at the workplace, which of the following four actions would you most likely take?" The choices were: "focus on unrelated matters," "change my own behaviour and actions towards what caused the problem," "talk things over with the parties involved," and "rely on alcohol or drugs."

Asking for social support

For social support, the participants were asked whether there was someone to talk to about concerns or problems on the job. The participants were asked to identify individuals they could talk to about the issues from among the following: "any person", "peers", "senior nursing staff", "superiors", and "friends and family."

Emotional control

In a brainstorming session with 10 nursing researchers, the following three items were chosen for emotional control: "I sometimes feel it difficult to control my anger", "I often disagree with other persons", and "I sometimes feel like breaking things when angry". These were measured using the VAS, assigning 0 for "Not at all" and 100 for "Definitely yes".

2.4.7 | Statistical analysis

1. In the descriptive statistics the authors detail the participant demographic characteristics, and compare the burnout scores by the demographic characteristics and workplace environment. The t-test and one-way analysis of variance were performed to test the significance level of the mean values.
2. Correlation coefficients between continuous variables (total assertiveness score, scored by the subscales; emotion control measured by VAS, workplace satisfaction, and workload) and the burnout scores were calculated.
3. A multiple regression analysis to select variables was performed, using explanatory variables where $p < .2$ and the absolute value of correlation coefficients $> .2$ in analyses (1) and (2), where the burnout score was used as the objective variable.
4. A causal model was created by using the final variables selected by the multiple regression analysis as the observed variables, and the fitness was verified by a covariance structure analysis.
5. For the statistical analysis, IBM SPSS Statistics (version 24.0) and AMOS were used.

3 | RESULTS

The authors collected 794 responses (61.7%), and excluded 52 responses which included two or more choices to a question or where there was no response to the questions of age, type of occupation, or to items included in the NNAS and MBI-HSS. The remaining 742 responses were determined to be valid. Further, the following respondents were excluded: two public health nurses, 32 midwives, and 63 male nurses that were determined to be significantly different from female nurses based on the average scores of the burnout and NNAS. Public health nurses and midwives were excluded as they are employed in different occupational categories, and males as depending on gender. Finally, data from 645 female novice nurses were analysed. The mean age was 22.60 ± 3.0 , ranging from 20–44 years

of age. For the classification of practical occupations, more than 90% were nurses, and for the final academic background, about 60% were nursing vocational school graduates. The mean score of the NNAS was 67.4 ± 10.3 , ranging from 32.0–96.0, and that of the MBI-HSS was 13.7 ± 2.5 , ranging from 7.0–20.0. There were no statistically significant differences in the mean scores of the NNAS and MBI-HSS among the participating hospitals.

3.1 | Burnout scores

Table 1 shows the burnout scores by participant demographic characteristics. There were no variables with statistically significant differences in the final academic background.

3.2 | Cronbach's α coefficients and confirmation of the factor structure of burnout and assertiveness

With the Japanese version of the MBI-HSS, for this study, a factor analysis was conducted using the maximum likelihood method, and Promax Rotation (three factors), and the following three factors were identified: physical exhaustion, depersonalization/emotional exhaustion, and personal accomplishment. Cronbach's α coefficients were .78–.87. For the Novice Nurse Assertiveness Scale (NNAS), this study adopted a factor analysis using the maximum likelihood method, and Promax Rotation (three factors), and identified the following three factors: acceptance of improper evaluations, unresponsive or aggressive, and non-assertive. Cronbach's α coefficients were .81. The factor structures of MBI-HSS and NNAS were very similar to the original version.

3.3 | Results of the multiple regression analysis

Table 2 shows the results of the multiple regression analysis with burnout as the objective variable, inputting all the variables for

TABLE 1 Personal factors and the total Maslach Burnout Inventory (MBI) score $N = 645$

Personal factors	<i>n</i>	%	Total MBI score	SD
Final academic background				
Vocational nursing school	386	59.84%	13.72	2.52
Nursing college	75	11.63%	13.26	2.21
Nursing university	120	18.60%	14.07	2.60
Nursing graduate school	2	0.31%	15.69	0.75
Five-year programme	54	8.37%	13.34	2.66

Abbreviation: SD, standard deviation.

assertiveness, workplace environment, and coping. In the assertiveness, all three subscales, Acceptance of improper evaluations ($\beta = 0.12, p < .01$), Unresponsive or aggressive ($\beta = -0.13, p < .01$), and Non-assertive ($\beta = 0.12, p < .01$) were significantly related to burnout. Further, the following items were significantly related to burnout: satisfaction with the workplace ($\beta = -0.25, p < .01$), and workload ($\beta = 0.12, p < .01$) among the workplace environment items; "Want to find another career" ($\beta = 0.18, p < .01$) and "Want to change workplace" ($\beta = 0.09, p < .01$) among transfer preference; "Talk things over with the parties involved" ($\beta = 0.07, p < .05$) and "Rely on alcohol or drugs" ($\beta = 0.07, p < .05$) in the coping mechanism among the Stress coping mechanisms; "Having persons other than at the workplace to consult with" ($\beta = -0.08, p < .01$) in the Asking for social support item; and "I sometimes feel like breaking things when angry" ($\beta = 0.13, p < .01$) in Emotional control.

3.4 | Creation and verification of a burnout causal model

Variables that were significant in the multiple regression analysis was set to the initial model, and the goodness of fit of the data was calculated by covariance structure analysis. Assuming an indirect impact of inappropriate assertive and inappropriate coping on job dissatisfaction between latent variables, and verifying the validity of this, GFI = 0.94, AGFI = 0.91, RMSEA = 0.66, and R^2 was .86. The causal relationship with burnout was explained using this model (Figure 2).

3.5 | Influence of assertiveness on burnout

Inappropriate assertiveness in this study consists of "the acceptance of improper evaluations," "non-assertive," and "being unresponsive or aggressive." A higher inappropriate assertiveness directly increases burnout (path coefficient: .22, $p < .05$). Further, it also affected job dissatisfaction (path coefficient: .39, $p < .01$) and indirectly affected burnout.

3.6 | Influence of coping on burnout

Inappropriate coping in this study consists of "I sometimes feel like breaking things when angry," "Talk things over with the parties involved," and "Rely on alcohol or drugs." A higher inappropriate coping directly increases burnout but not statistically significantly. Further, it also affected job dissatisfaction (path coefficient: .59, $p < .05$). However, these affected the job dissatisfaction (path coefficient: .59; $p < .05$) and indirectly affected burnout. But differently, the results suggest that inappropriate coping was not directly, but indirectly affecting burnout.

TABLE 2 Multiple regression analysis for burnout N = 645

	β	T value	p value
Age	-0.05	-1.60	.11
Assertiveness			
Accept improper evaluations	0.12	3.05	.00**
Unresponsive or aggressive	-0.13	-4.02	.00**
Non-assertive	0.12	2.94	.00**
Work environment			
Satisfaction with the workplace and workload			
Satisfaction with the workplace	-0.25	-6.44	.00**
Satisfaction with workload	0.12	3.79	.00**
Ward assignment preference			
Satisfied despite being assigned to a different ward	-0.03	-1.01	.31
Dissatisfied about being assigned to a different ward	0.00	0.09	.93
Dissatisfied despite being assigned to the ward of choice	0.06	1.60	.09
Transfer preference			
Want to get a higher degree	0.01	0.20	.84
Want to change workplace	0.09	2.53	.01**
Want to find another career	0.18	5.27	.00**
Stress coping mechanisms			
Coping mechanisms			
Focus on unrelated matters	0.04	1.33	.18
Talk things over with the parties involved	0.07	2.09	.04*
Rely on alcohol or drugs	0.07	2.34	.02*
Ask for details of social support			
Friends and family	-0.08	-2.70	.01**
Peers	-0.02	-0.58	.56
Senior nursing staff	0.00	0.05	.96
Superiors	-0.02	-0.58	.56
Emotional control			
I sometimes feel it difficult to control my anger	-0.02	-0.43	.67
I often disagree with other persons	0.04	1.05	.29
I sometimes feel like breaking things when angry	0.13	3.58	.00**
R	R ²	Adjusted R ²	
.66	.43	.41	

Note: Ward assignment preference: Satisfied to be assigned to the ward of choice = 0, other = 0/Satisfied despite being assigned to a different ward = 1, other = 0/Dissatisfied about being assigned to a different ward = 1, other = 0/Dissatisfied despite being assigned to the ward of choice = 1, other = 0.

Transfer preference: No wishes for transfer = 0, other = 0/Want to get a higher degree = 1, other = 0/Want to change workplace = 1, other = 0/Want to find another career = 1, other = 0.

Coping mechanisms: Change my own behaviour and actions that caused the problem = 0, other = 0/Focus on unrelated matters = 1, other = 0/

Talk things over with the parties involved = 1, other = 0/Rely on alcohol or drugs = 1, other = 0.

**p < .01.

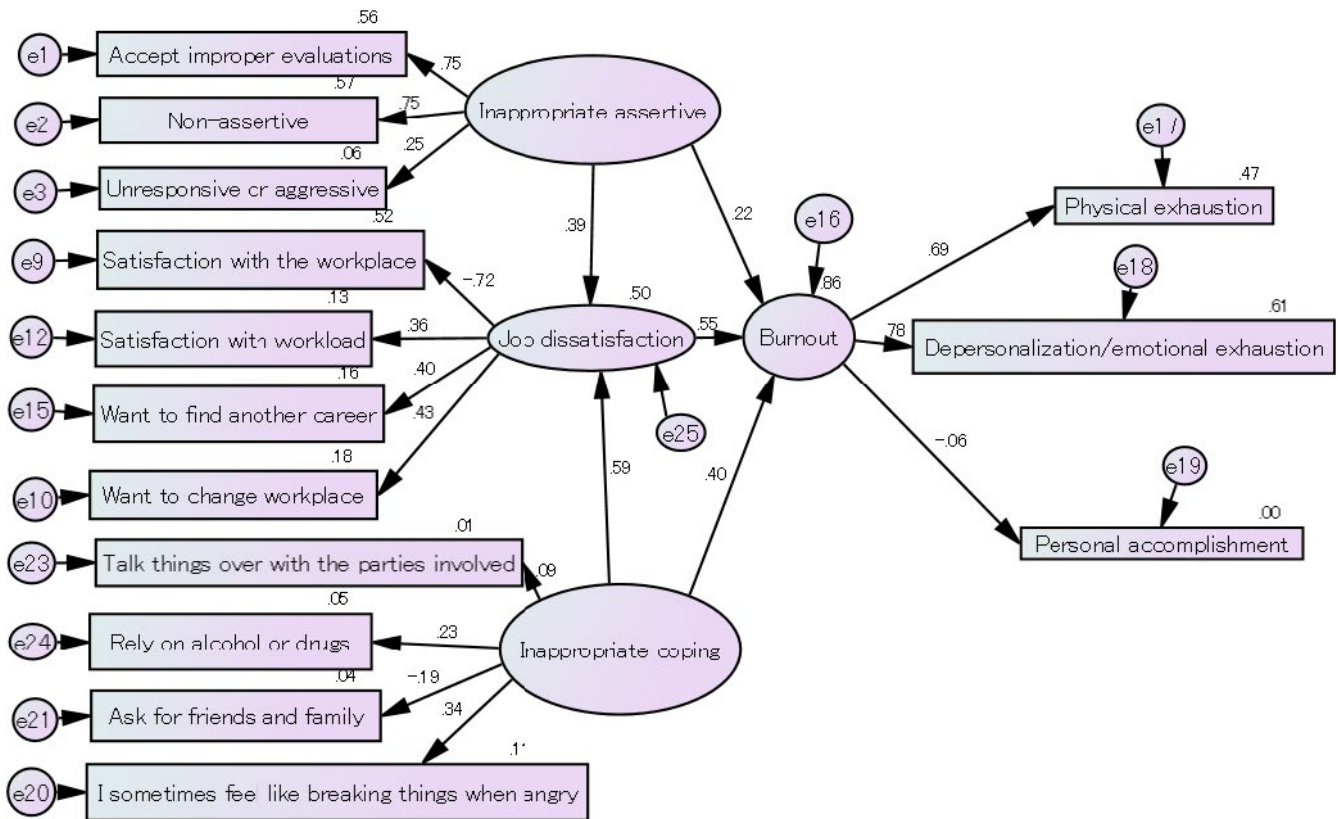


FIGURE 2 Assertiveness, stress coping, workplace environment affecting burnout among novice nurses

3.7 | Influence of the workplace environment on burnout

Job dissatisfaction in this study consists of “Want to change workplace,” “Want to find another career,” “Workload” and “Satisfaction with the workplace.” A higher job dissatisfaction directly increases burnout. Also, inappropriate assertiveness (path coefficient: .39, $p < .01$) and inappropriate coping (path coefficient: 0.59, $p < .01$) affected the job dissatisfaction, and in turn, affected burnout (path coefficient: 0.55, $p < .01$).

3.8 | Direct, indirect, and total effects

(a) The direct, indirect, and total effects of assertiveness are 0.22, $0.39 \times 0.55 = 0.21$, and $0.22 + 0.21 = 0.43$, respectively. (b) The direct, indirect, and total effects of coping are 0.40, $0.59 \times 0.55 = 0.32$, and $0.40 + 0.32 = 0.72$, respectively, with the direct effect not statistically significant. (c) The direct effect of the work environment is 0.55.

3.9 | Coefficients of determination of burnout

The coefficients of determination (R^2) of burnout was .86. Physical exhaustion ($R^2 = .47$; $p < .01$) and depersonalization/emotional

exhaustion ($R^2 = .61$; $p < .01$), which were subscales, were statistically significantly affected burnout, but personal accomplishment was 0.00, explaining little of the burnout.

4 | DISCUSSION

The mean age of the participants is very similar to previous studies of novice nurses in university hospitals (Suzuki, Kanoya, et al., 2006). However, for the final academic background there were more nurses who graduated from vocational nursing schools than in the previous studies. This difference may be because the present study targeted novice nurses in university hospitals as well as nurses working in national administrative corporations. There were no significant differences in the mean scores of the NNAS and MBI-HSS among the participating hospitals. Taken together the study population is comprised of novice nurses working in hospitals with a relatively large number of beds (400+) in the Kanto and Tokai regions of Japan.

4.1 | Factors related to burnout

The results of the multiple regression analysis gave a freedom adjusted coefficient of determination as 41% in the assertiveness, coping, and workplace environment. Murase et al. (2007) explain that

interpretations of the adjusted R^2 will be valid if it is .20 or higher, due to the large statistical noise in social science surveys (Murase et al., 2007).

4.2 | Verification of the causal model

4.2.1 | Goodness of fit of the model

The GFI and AGFI of the model satisfied the statistical standards (Yamamoto, 2002), giving it a good fit. It is known that the RMSEA is good if it is 0.05 or below (Toyota, 2008), not good if it is 0.1 or higher. It is commonly considered that the fit is strong if it is 0.08 or below (Yamamoto, 2002). In this study, the goodness of fit was good with 0.66.

4.2.2 | The causal model of influence of assertiveness, coping and workplace environment on burnout

It was verified that all of the assertiveness, coping, and workplace environment factors directly or indirectly affect burnout.

Assertiveness

In previous studies on assertiveness, J-RAS has been used. Suzuki, Kanoya, et al. (2006) reported that novice nurses develop burnout even when they are able to express what they want to say overly clearly and also if they are not able to express what they want to say. Further, Tamai et al. (2007) reported that it is not appropriate to interpret higher scores in the RAS as assertive in Japan, and that a higher score in the RAS is interpreted as showing aggressiveness (Tamai et al., 2007). The concepts of "Not being able to speak and being aggressive" are similar to those of the acceptance of improper evaluations, unresponsive or aggressive, and non-assertive in the subscales. The J-RAS is a Japanese version of an assertiveness schedule (survey) developed in a country with a culture different from that of Japan. Further, as the question items in the J-RAS were prepared using everyday life situations like "At a restaurant ...", it may be difficult to relate it to the details of the self-expression of Japanese novice nurses at work. This study used a scale to measure assertiveness in the workplace for novice nurses in Japan (Suzuki, 2017). This assists in elucidating the viewpoint expressed in the subscale and influence of the acceptance of improper evaluations, unresponsive or aggressive, and non-assertive, which can be seen as types of communication, making the influence on burnout become clear.

In this study, through the influence of the acceptance of improper evaluations, non-assertion, and unresponsive or aggressive, the inappropriate assertiveness of the latent variable affected burnout directly, and it is also affecting the burnout indirectly through the workplace environment. The acceptance of improper evaluations is

a passive self-expression to accept improper evaluations by others. Non-assertive is an indirect non-assertive self-expression which gives others priority over self-matters. Unresponsive or aggressive is an inappropriate self-expression that stresses the self-rights priority. It was found that if novice nurses accept improper evaluations by others, cannot express what they should do, and show unresponsive or aggressive attitudes in the workplace, such attitudes affect burnout directly and also lead to dissatisfaction with the job, resulting in burnout.

In previous studies, it was reported that the assertiveness of novice nurses affected burnout, and similar results were obtained in this study. Previous studies have not reported that assertiveness was related to job dissatisfaction, and there are no reports of assertiveness affecting burnout through job dissatisfaction. This result of the present study has not been reported elsewhere.

Coping methods

The relationship between coping and burnout has been reported in a previous study that investigated nurses (Kitaoka-Higashiguchi & Nakagaw, 2003). A coping attitude, "Asking for support" has also been reported to affect burnout in a previous study on novice nurses (Suzuki, Kanoya, et al., 2006). For Emotional control, being irritated is reported as a factor affecting burnout in studies focusing on nurses who have children (Maruyama et al., 2016; Takayama et al., 2016). These stress coping methods may affect burnout among novice nurses. However, in the present study, stress coping was an indirect factor affecting burnout. It was found that novice nurses become dissatisfied with the workplace if they cannot cope with the stress, resulting in burnout.

Workplace environment

Satisfaction with the workplace, workload, and transfer preferences (Wanting to find another career and Wanting to change workplace) affected the dissatisfaction with the job, the latent variable, and in turn, burnout. Previous studies that investigated novice nurses in university hospitals reported that the workplace environment and transfer preferences are factors affecting burnout (Takaoka et al., 2013; Suzuki et al., 2018), and in the present study the dissatisfaction with the workplace itself had a direct influence on burnout. Further, inappropriate coping and inappropriate assertiveness were found to affect burnout through dissatisfaction with the workplace.

These results supported the NIOSH (National Institute of Occupational Health and Safety). The NIOSH (Hurrell & McLaney, 1988) lists work stress factors as factors that affect the acute stress response of workers, and factors that adjust the relationship between the two are factors such as individual factors and buffer factors (family support). This study listed work stress factors as factors (poor job satisfaction) that affect the acute stress (burnout) response of workers, the factors that adjust the relationship between the two are factors such as individual factors (assertiveness) and buffer factors (coping mechanisms, asking for social support form friend and family, emotional control).

Coefficients of determination of burnout

Although the coefficients of determination of the subscales of burnout were high in physical exhaustion, and depersonalization/emotional exhaustion, personal accomplishment explained burnout only little. This may be because the participants in this study have had fewer opportunities to experience personal accomplishments as the novice nurses had only worked less than 1 year. Among the scales to measure burnout, the Maslach Burnout Inventory (MBI) is widely employed, and is becoming a worldwide accepted standard (Tao & Kubo, 1996). The MBI addresses the following types of employment: MBI-Human Services Survey (MBI-HSS) (Maslach & Jackson, 1981b) designed for medical professionals, the MBI-Educator Survey (MBI-ES) (Maslach et al., 1986) designed for those who are involved in education, and the MBI-General Survey (MBI-GS) (Schaufeli et al., 1996) designed for professionals in general. Many studies have shown that younger respondents tend to suffer burnout more easily (Williams, 1989; Suzuki, 2003), and burnout has been investigated as an occupational stress syndrome that also applies to non-medical personnel (Tao & Kubo, 1996). However, when the study of burnout originally started, it had long been regarded to be a syndrome experienced by personnel who served others, and none of the scales described above in this section of the present paper are really suitable for novice nurses. For the future, the authors wish to try to develop a scale that is able to measure burnout among novice nurses.

4.3 | Study limitations

The study population here is novice nurses who work in 12 university hospitals and hospitals associated with these, and five hospitals of National Hospital Organizations in the Kanto and Tokai regions of Japan, and the results reported here cannot be generalized. In addition, the results show causal relationships determined by statistic measures. Additional studies are needed by conducting longitudinal studies to elucidate the causal relationship with higher precision. The results based on J-MBI may not be applicable to non-Japanese situations because J-MBI is a form of the MBI that has been validated only for Japanese.

5 | CONCLUSIONS

(a) This study developed and validated a Causal Model focused on assertiveness, stress coping, and workplace environment as factors affecting burnout among novice nurses. (b) Novice nurses who cannot communicate assertively could be subject to burnout just because they cannot communicate assertively, and those who rely on inappropriate coping are likely to experience burnout just because of this, or burnout may arise because the missing ability to communicate assertively will lead to the development of dissatisfaction with the workplace. Assertiveness training for novice nurses and instruction in how to cope with stress may be able to help these prevent burnout. (c) Those who accept improper evaluations by others, cannot express their insufficient agreement with what they should do,

and show unresponsive or aggressive attitudes in the workplace, would tend to become dissatisfied with their job and could suffer burnout. (d) Those who employ inappropriate coping methods would tend to be dissatisfied with the job and could suffer burnout. (e) Those who are dissatisfied with the workplace and workload, and who would prefer a job transfer are likely to suffer from burnout just because of these reasons. (f) Support programmes for assertiveness training or opportunities to learn appropriate coping methods may contribute to burnout prevention. (g) The findings of this study show that novice nurses display a lower risk of burnout and become able to respond assertively to patients when they are given assertiveness and coping training. The lower risk of burnout may lead to a reduction in medical accidents because it has been reported that medical accidents are more likely to occur when novice nurses suffer from burnout. Based on the self-assertiveness of novice nurses, nursing managers can evaluate and consider what would happen and what instruction is possible. The findings here are also useful for senior nurses to decide how to respond to novice nurses.

ACKNOWLEDGEMENTS

We wish to thank the novice nurses, directors, and nursing department staff for their help in the present study. We also wish to thank Dr. Masaki Nagai, former professor of Saitama Medical University, and Dr. Chifumi Sato, former professor of Tokyo Medical and Dental University for instruction and helpful advice. This study was supported by a research grant from the Ministry of Education Science Culture & Sports in 2015–2017 (Number 15K11560).

CONFLICT OF INTEREST

All author report no conflict of interest related to our manuscript.

AUTHOR CONTRIBUTIONS

ES, YT, CK and CA contributed to the conception and design of this study; ES, HT, TM performed the statistical analysis and drafted the manuscript; and YH, HK, MM critically reviewed the manuscript and supervised the whole study process. All authors read and approved the final manuscript.

ETHICAL APPROVAL

Cooperation of the directors of the nursing service department at the hospitals was requested by explaining the purpose of this study orally and in writing. The study objectives and methods were explained in writing to the participating nurses: they were informed that their anonymity would be guaranteed, that their participation and withdrawal would be at their own free will, and that refusal to participate or withdrawal of consent would not result in any negative consequences. The authors stated that the study protocol would strictly follow the Declaration of Helsinki and basic ethical guidelines, and that the participants had the right to post the questionnaire blank, or not to post it in case they did not consent to participate. The protocol of this study was approved by the ethics review committee of the institution the authors belong to. (Ethics review approval number: October, 20th, 2015. number 15-1g-62).

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available upon reasonable request.

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How to cite this article: Suzuki E, Takayama Y, Kinouchi C, et al. A causal model on assertiveness, stress coping, and workplace environment: Factors affecting novice nurses' burnout. *Nurs Open*. 2021;00:1–11. <https://doi.org/10.1002/nop2.763>