

## ORIGINAL ARTICLE

## Examination of a cognitive model of stress, burnout, and intention to resign for Japanese nurses

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**Aim:** A reduction in burnout is required to decrease the voluntary turnover of nurses. This study was carried out with the aim of establishing a cognitive model of stress, burnout, and intention to resign for nurses.

**Methods:** A questionnaire survey was administered to 336 nurses (27 male and 309 female) who had worked for ≤5 years at a hospital with multiple departments. The survey included an evaluation of burnout (Maslach Burnout Inventory), stress (Nursing Job Stressor Scale), automatic thoughts (Automatic Thoughts Questionnaire-Revised), and irrational beliefs (Japanese Irrational Belief Test), in addition to the intention to resign.

**Results:** The stressors that affected burnout in the nurses included conflict with other nursing staff, nursing role conflict, qualitative workload, quantitative workload, and conflict with patients. The irrational beliefs that were related to burnout included dependence, problem avoidance, and helplessness. In order to examine the automatic thoughts affecting burnout, groups with low and high negative automatic thoughts and low and high positive automatic thoughts were established. A two-way ANOVA showed a significant interaction of these factors with emotional exhaustion, but no significant interaction with depersonalization and a personal sense of accomplishment. Only the major effect was significant. The final model showed a process of “stressor → irrational beliefs → negative automatic thoughts/positive automatic thoughts → burnout”. In addition, a relationship between burnout and an intention to resign was shown.

**Conclusion:** These results suggest that stress and burnout in nurses might be prevented and that the number of nurses who leave their position could be decreased by changing irrational beliefs to rational beliefs, decreasing negative automatic thoughts, and facilitating positive automatic thoughts.

**Key words:** burnout, cognitive-behavioral therapy, nurse.

## INTRODUCTION

The turnover rate of nurses in Japan was 12.6% in the financial year of 2007, which was 0.2% higher than the rate reported in 2006 (Japanese Nursing Association, 2009). This turnover rate might be related to organizational factors, such as the lack of a sense of fulfillment at work and a heavy vocational burden, and working

stress, such as relationships with colleagues (Hayes *et al.*, 2006). The rate is also related to burnout (Leiter & Maslach, 2009; Tsuchie & Nakamura, 1993). The word “burnout” began to be used by Freudenberg, a psychiatrist in the USA, in 1974 to describe the mental and physical exhaustion of medical workers (Freudenberg, 1974). In 1981, Maslach and Jackson (1981, p. 99) defined burnout as a:

... syndrome mainly with excessive mental and physical fatigue and emotional depletion caused by excessive requirement for psychical energy during a process to support others for a long period of time, accompanying self-deprecation, aversion to work, and lack of compassion.

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In Japan, many reports have suggested that younger nurses tend to have burnout (Yamazaki, Ishida, & Kashiwakura, 1999) and that nurses with clinical experience of 1–5 years have higher stress (Hori, Suzuki, & Shiraishi, 2000). Thus, it is important to provide support for nurses with this level of experience.

As an approach to the prevention of burnout that is related to the turnover of nurses, Spooner-Lane and Patton (2007) suggested a need for preventive interventions on an organizational basis, while AbuAlRub and Al-Zarus (2008) and Wu, Zhu, Wang, Wang, and Lan (2007) suggested the importance of strengthening the cognitive measurements for individual nurses. Thus, methods for the prevention of burnout can be divided into organizational and personal approaches. In Japan, organizational approaches for the prevention of turnover, such as empowerment (Maeda *et al.*, 2007), have been initiated, but to our knowledge, cognitive strategies for burnout in individual nurses have not been examined.

Maslach and Jackson (1981) defined burnout based on three symptoms: emotional exhaustion, depersonalization, and a lowered personal sense of accomplishment. Emotional exhaustion was suggested to be the core symptom. As the work of nurses is a human service in which they must appropriately respond to one-sided requests from patients while suppressing their emotions, their work might be considered as “emotional work”. In recent years, the relationship between this kind of work and burnout has been discussed and Hochschild (2000) suggested that persons with a high risk of burnout are likely to have heartache, considering that the response of a client to their official role is tailored to the persons’ own personality. In other words, this becomes a “cognitive” problem because such persons cannot view the stress that is caused by their official role as a nurse independently from their personality.

In considering the prevention of burnout from the standpoint of personal cognition, the cognitive therapy that was developed by Beck (1990) for depression can be used as an approach to emotional control by changing the cognition that an event occurred due to a participant’s own personality. In this therapy, depression is considered to be due to incorrect distorted cognition, rather than caused directly by a stressful event, and the factors that cause and maintain depression can be classified into three categories: schema, logical thinking errors, and automatic thoughts. Schema is a core belief and a personal, consistent style of cognition. A logical thinking error is a style of processing information from others that can be observed in persons with depression.

Automatic thoughts are ideas that emerge automatically, regardless of personal will (Beck). Automatic thoughts include negative thoughts that can cause depression and positive thoughts, which have a negative correlation with depression and negative automatic thoughts (Ingram, Kendall, Siegle, Guarino, & McLaughlin, 1995).

Collectively, these ideas suggest that a specific schema in the cognition of nurses who develop burnout might cause negative automatic thoughts and emotions and that the accumulation of such thoughts and emotions could induce burnout. The schema, which is considered to cause negative automatic thoughts, is used as a synonym of a personal, consistent belief system in many cases. Ellis (1962) conceptualized the belief system as represented by the word “must”, which is related to depression, and as an unfounded, but absolute and ideological, concept, which is defined as an “irrational belief”. Balever (2001) studied the relationship between the burnout of nurses and irrational beliefs. No measurement scale for schema that is related to burnout has been developed, but a scale for irrational beliefs is available. Thus, in this study, nurses’ irrational beliefs were measured in an attempt to measure the schema of nurses as a background factor for automatic thoughts.

As mentioned above, the burnout of nurses might be related to irrational beliefs that are specific to nurses and the automatic thoughts that are caused by the irrational beliefs. We hypothesized that such distorted cognition would cause emotional exhaustion and burnout and, thus, we established the model that is shown in Figure 1. In this study, first, we examined the differences in burnout depending on personal factors. Next, relationships among the stressors, irrational beliefs, and automatic thoughts that affect burnout were examined.

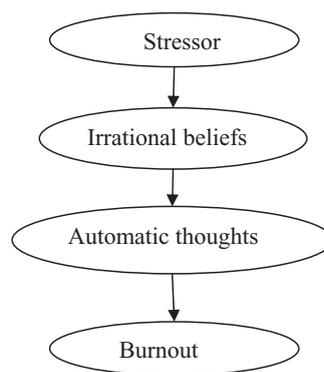


Figure 1 Hypothetical model of this study.

Then, the validity of the hypothetical model was examined. Finally, the relationship between the intention to resign and burnout were examined. Confirmation of the validity of the model might make it possible to provide cognitive behavioral therapy for the reduction of burnout.

## METHODS

### Participants

The participants were 445 nurses who had worked for  $\leq 5$  years at three hospitals with several departments for acute treatment.

### Sampling

Eight hospitals that provided acute medical treatment in the Kansai district in Japan were chosen at random. The nursing director of each hospital was asked to cooperate with the study and consent was obtained from three hospitals. One of the researchers distributed the questionnaires and the participants were given 2 weeks to complete them. After the enrollment of the participants, the questionnaires were placed in an envelope that was prepared for each ward and sealed before collection. The study was carried out in October and November 2008.

### Instruments

The study was based on the use of self-report questionnaires. The details of the surveys and measurement scales that were used in the study are as follows.

#### *Personal factors*

The burnout of nurses has been related to their sex, age, department of work, educational background, marital status, and clinical experience (Kitaoka-Higashiguchi *et al.*, 2004; Suzuki, Itomine, Saito, Katuki, & Sato, 2008; Tao & Kubo, 1996; Yamazaki *et al.*, 1999). Therefore, the data for these factors were obtained in the study.

#### *Burnout*

The Maslach Burnout Inventory (MBI) was used to evaluate burnout. This scale was developed by Tao and Kubo (1992) by revising the scale of Maslach and Jackson (1981) and includes three factors: emotional exhaustion, depersonalization, and personal accomplishment. The scale has 17 questions and the participants select one of five answers from “always yes” to “no”. Higher scores for emotional exhaustion and depersonalization and lower scores for personal accomplishment show a high tendency for burnout. Nagai and Ono (2008) showed the reliability of the MBI, based on a Cronbach’s  $\alpha$ -coefficient of 0.84–0.86. The validity of this measure was verified by confirming a relationship with psychosomatic signs (mental fatigue, physical fatigue, decline of attentiveness) (Tao & Kubo).

#### *Stressors*

The Nursing Job Stressor Scale (NJSS), which was developed by Higashiguchi *et al.* (1998), was used to evaluate stress. The NJSS consists of 33 items that describe potentially stressful situations for nurses, divided into the following seven subscales: conflict with other nursing staff, nursing role conflict, conflict with physicians/autonomy, dealing with death and dying, qualitative workload, quantitative workload, and conflict with patients. The higher the score, the greater the burden of the stressor. Higashiguchi *et al.* showed the reliability of the NJSS, based on a Cronbach’s  $\alpha$ -coefficient of 0.75–0.85, and tested the validity of the scale by using MBI scores as external criteria.

#### *Automatic thoughts*

The Japanese version of the Automatic Thoughts Questionnaire-Revised (ATQ-R), established by Kodama, Katayanagi, Shimada, and Sakano (1994), was used. This scale was established by translating the scale of Kendall and Ingram (1989) and has 38 questions, including 15 items for a negative evaluation of the future (“future negation”), 13 items for self-blame (“self-negation”), and 10 items for positive thinking. The participants select one of five answers from “definitely yes” to “definitely no”. Higher scores on these subscales show that the participants have strong automatic thoughts. Kodama *et al.* showed the reliability of the ATQ-R, based on a Cronbach’s  $\alpha$ -coefficient of 0.88–0.94, and tested the validity by using correlations with the Beck Depression Inventory and the Ways of Coping Check Lists-Revised.

#### *Irrational beliefs*

For the measurement of irrational beliefs, the Japanese brief version of the Irrational Belief Scale (Japanese Irrational Belief Test, JIBT-20) was used (Mori, Hasegawa, Ishikuma, Shimada, & Sakano, 1994). This scale is the shortened version of the 70 item scale that Matsumura (1991) developed, originally based on the theory of Ellis (1962), and is composed of 20 questions in total, including four for each of five factors: self-expectation, dependence, ethical blame, problem avoidance, and help-

lessness. The participants select one of five answers from “definitely yes” to “definitely no”. Higher scores show that the participants have strong irrational beliefs. Mori *et al.* showed the reliability of the JIBT-20, based on a Cronbach’s  $\alpha$ -coefficient of 0.65–0.89, and tested the validity by using correlations with the Social Interaction Self-statement and Social Avoidance and Distress Scale.

### *Intention to resign*

The participants were asked about their intention to resign at the time of the study, based on categories made by Tsuchie and Nakamura (1993): whether or not they wanted to continue to work as a nurse, wanted to switch hospitals or departments, or wanted to quit working as a nurse.

### **Data analysis**

An  $\alpha$ -coefficient was calculated to examine the reliability of the answers on each scale. Correlations between burnout and the characteristics of the participants were examined by a *t*-test and one-way ANOVA. The relationships between burnout and stressors were examined by a multiple linear regression analysis, with the seven NJSS subscales used as the independent variables and the three MBI subscales used as the dependent variables. Similarly, the relationships between burnout and irrational beliefs were examined by a multiple linear regression analysis, with the five JIBT-20 subscales used as the independent variables and the three MBI subscales used as the dependent variables. The relationship of burnout with negative and positive automatic thoughts was examined by dividing the participants into groups with low and high “negative automatic thoughts” and into groups with low and high “positive automatic thoughts”, based on the median scores. A two-way ANOVA was carried out by using the three MBI subscales. “Future negation” and “self-negation” on the ATQ-R were included as negative automatic thoughts.

Based on the results of the analyses of the stressors, irrational beliefs, and automatic thoughts, the hypothetical model (Fig. 1) was examined with a covariance structure analysis using related variables. To evaluate the hypothetical model, comparisons were carried out of the indirect and direct effects and of the three models in which burnout affected cognition. The models with high conformance were selected by using the Goodness of Fit Index (GFI), Adjusted GFI (AGFI), Comparative Fit Index, Root Mean Square Error of Approximation (RMSEA), and Akaike’s Information Criterion (AIC). In order to examine the relationship between burnout and the intention to resign, a logistic multiple linear regres-

sion analysis was carried out with the three MBI subscales as the independent variables and the three items of the intention to resign as the dependent variables. SPSS v. 11.5 and AMOS v. 5.0 (SPSS, Tokyo, Japan) were used for all the analyses, with a significance level of 5%.

### **Ethical considerations**

This study was carried out after obtaining approval from the Ethical Committee for Epidemiological Studies at Hiroshima University, Hiroshima, Japan. A written explanation was provided to the participants regarding the study’s objectives, methods, protection of anonymity, and the voluntary nature of participation. It was explained clearly that the data would be used only for this study. The receipt of the answers to the questionnaires was taken to indicate informed consent.

## **RESULTS**

Questionnaires were distributed to 445 nurses and answers were collected from 347 nurses (collection rate: 78.1%). After exclusion of the missing values and outliers, the data from 336 nurses (27 male and 309 female) were used in the analysis (response rate: 75.5%).

### **Reliability of the individual scales and descriptive statistical values**

The  $\alpha$ -coefficients for the different subscales were as follows: JIBT-20 for irrational beliefs, 0.70–0.84; ATQ-R for automatic thoughts, 0.76–0.94; NJSS for stressors, 0.70–0.91; and MBI for burnout, 0.76–0.86 (Table 1). As the coefficient of reliability for each scale was close to the acceptable value and to the reliability of the original scale, we judged that each scale showed internal consistency.

### **Factors affecting burnout**

For emotional exhaustion, significant differences were found for sex, age, marital status, and department of work (Table 2). The scores of the female participants were significantly higher than those of the male participants ( $P < 0.05$ ). The scores of the participants who were aged 20–25 years were higher than those of the older participants ( $P < 0.05$ ) and a multiple comparison showed that the participants who were aged 20–25 years had significantly higher scores than the participants who were aged 31–35 years ( $P < 0.05$ ). The scores of the single participants were significantly higher than those of the married participants ( $P < 0.01$ ). The department where the nurses worked also had a significant effect ( $P < 0.01$ ), with the scores of the nurses in the

**Table 1** Descriptive statistics for each scale

Scale	N	Mean	SD	$\alpha$ -coefficient
<b>JIBT-20</b>				
Self-expectation	336	11.30	2.90	0.84
Dependence	336	13.97	2.79	0.78
Ethical blame	336	14.60	2.45	0.75
Problem avoidance	336	11.27	2.35	0.74
Helplessness	336	13.68	2.31	0.70
<b>ATQ-R</b>				
Negative evaluation of the future	336	35.84	11.38	0.94
Negative self-evaluation	336	36.18	7.66	0.86
Positive thinking	336	26.99	5.30	0.76
<b>NJSS</b>				
Total strain	336	85.77	18.35	0.91
Conflict with other nursing staff	336	17.44	5.81	0.81
Nursing role conflict	336	13.48	3.49	0.82
Conflict with physicians/autonomy	336	10.68	4.82	0.84
Dealing with death and dying	336	8.75	3.89	0.70
Qualitative workload	336	14.46	3.36	0.77
Quantitative workload	336	15.59	3.27	0.82
Conflict with patients	336	5.37	1.90	0.76
<b>MBI</b>				
Emotional exhaustion	336	17.63	4.61	0.83
Depersonalization	336	12.99	5.11	0.86
Personal accomplishment	336	13.13	3.89	0.76

JIBT-20, Japanese Irrational Belief Test; ATQ-R, Automatic Thoughts Questionnaire-Revised; NJSS, Nursing Job Stressor Scale; MBI, Maslach Burnout Inventory.

obstetrics and gynecology departments being higher than those of the nurses in the other departments ( $P < 0.05$ ).

For depersonalization, a significant difference was found for clinical experience ( $P < 0.05$ ). A multiple comparison showed that the scores of the participants with clinical experience of <3 years were higher than those of the participants with more experience. Regarding personal accomplishment, a significant difference was found for the department ( $P < 0.01$ ), with the scores of the nurses in the pediatrics and outpatient departments being significantly higher than those of the nurses in the obstetrics and gynecology departments ( $P < 0.05$ ).

### Relationships among the stressors, irrational beliefs, and automatic thoughts affecting burnout

For stressors, the emotional exhaustion subscale of burnout showed positive correlations with qualitative workload ( $P < 0.01$ ), quantitative workload ( $P < 0.01$ ), and conflict with patients ( $P < 0.01$ ). The depersonaliza-

tion subscale showed positive correlations with conflict with other nursing staff ( $P < 0.01$ ), qualitative workload ( $P < 0.05$ ), quantitative workload ( $P < 0.01$ ), and conflict with patients ( $P < 0.01$ ) and a negative correlation with nursing role conflict ( $P < 0.01$ ). The personal accomplishment subscale showed negative correlations with qualitative workload ( $P < 0.01$ ) and quantitative workload ( $P < 0.01$ ) and a positive correlation with nursing role conflict ( $P < 0.01$ ) (Table 3).

For irrational beliefs, emotional exhaustion related to burnout showed positive correlations with dependence ( $P < 0.01$ ) and helplessness ( $P < 0.01$ ), depersonalization showed positive correlations with dependence ( $P < 0.01$ ) and problem avoidance ( $P < 0.01$ ), and personal accomplishment showed negative correlations with dependence ( $P < 0.01$ ) and helplessness ( $P < 0.01$ ) (Table 4).

The scores for negative automatic thoughts and positive automatic thoughts were categorized into low and high levels by using the respective median scores as cut-off points. A two-way ANOVA was carried out for those cells that were defined by a combination of these levels in order to examine the interactional and main

**Table 2** Relationships between the nurses' attributes and burnout

Nursing attribute	N	%	Emotional exhaustion		Depersonalization		Personal accomplishment	
			Mean	SD	Mean	SD	Mean	SD
<b>Sex</b>								
Male	27	8.0	15.74	4.49	13.30	5.66	13.85	4.16
Female	309	92.0	17.79*†	4.60	12.97	5.06	13.06	3.87
<b>Age (years)</b>								
20–25	193	57.4	17.91	4.57	13.08	5.17	13.03	3.84
26–30	123	36.6	17.67*†	4.67	13.41	5.24	13.29	3.91
31–35	13	3.9	14.81	3.80	11.90	4.23	14.43	4.49
36–44	7	2.1	15.86	5.67	9.43	2.37	11.00	3.00
<b>Educational background</b>								
Technical college	224	66.6	17.31	4.68	12.80	5.29	13.06	3.94
Junior college	12	3.6	19.58	3.48	14.25	5.22	12.42	3.23
University	86	25.6	18.02	4.25	13.37	4.71	13.30	3.98
Graduate school	1	0.3	24.00	–	20.00	–	7.00	–
Advanced courses	13	3.9	18.23	6.17	12.15	4.24	14.15	2.82
<b>Marital status</b>								
Single	306	91.1	17.91**†	4.54	13.12	5.09	13.04	3.77
Married	30	8.9	14.73	4.44	11.73	5.17	14.03	4.99
<b>Department</b>								
Internal medicine	67	19.9	18.22	4.80	13.76	5.45	12.73	4.27
Surgery	103	30.7	17.97	4.45	13.24	4.70	13.28	3.57
Obstetrics and gynecology	25	7.4	20.44	4.06	14.92	6.26	11.04	3.12
Pediatrics	27	8.0	17.44*†	3.61	12.44	4.21	14.44*†	4.26
Mixed ward	50	14.9	16.64	4.36	12.22	4.45	13.54	3.42
Operating room	14	4.2	17.29	3.85	12.29	5.86	12.71	4.01
Critical care	23	6.8	16.43	5.48	11.83	5.22	11.74	3.70
Outpatient	27	8.0	15.44	4.91	11.70	5.69	14.74	4.36
<b>Amount of experience (years)</b>								
≤1	100	30.0	17.98	4.55	12.29*†	4.87	12.47	4.09
≤2	94	28.0	17.56	4.74	12.87	4.68	13.01	3.57
≤3	52	15.0	18.46	4.59	15.33	6.22	13.27	4.15
≤4	59	18.0	16.69	4.70	12.53	4.90	13.95	3.83
≤5	31	9.0	17.06	4.21	12.61	4.57	13.77	3.68

\* $P < 0.05$ , \*\* $P < 0.01$ . †Student's *t*-test; ‡one-way ANOVA (Tukey's multiple comparisons test).

**Table 3** Stressors associated with burnout

Stressor	Emotional exhaustion	Depersonalization	Personal accomplishment
	$\beta$	$\beta$	$\beta$
Conflict with other nursing staff	0.08	0.28**	0.11
Nursing role conflict	-0.06	-0.17**	0.25**
Conflict with physicians/autonomy	-0.08	-0.01	0.04
Dealing with death and dying	-0.05	-0.02	0.10
Qualitative workload	0.22**	0.15*	-0.21**
Quantitative workload	0.42**	0.19**	-0.19**
Conflict with patients	0.19**	0.24**	-0.10
$R^2$	0.42**	0.32**	0.39**

\* $P < 0.05$ , \*\* $P < 0.01$ .

**Table 4** Irrational beliefs associated with burnout

Irrational belief	Emotional exhaustion	Depersonalization	Personal accomplishment
	$\beta$	$\beta$	$\beta$
Self-expectation	-0.03	-0.01	0.10
Dependence	0.23**	0.15**	-0.14**
Ethical blame	-0.04	-0.04	0.08
Problem avoidance	0.10	0.26**	-0.08
Helplessness	0.16**	0.05	-0.13**
$R^2$	0.34**	0.34**	0.25**

\*\* $P < 0.01$ .

effects of negative automatic thoughts and positive automatic thoughts on each subscale of the MBI. Observation of the cell means in Table 5 seemed to indicate larger effects of positive automatic thoughts for higher negative automatic thoughts and larger effects of negative automatic thoughts for lower positive automatic thoughts for all the subscales, but the two-way ANOVA revealed that the interactional effect of positive automatic thoughts and negative automatic thoughts was not significant for depersonalization and personal accomplishment. Therefore, we examined the main effects of positive automatic thoughts and negative automatic thoughts independently and both were found to be highly significant. However, for emotional exhaustion, the interactional effect of negative automatic thoughts and positive automatic thoughts was found to be significant at the 5% level. Therefore, we examined the effect of one factor (“positive automatic thoughts” or “negative automatic thoughts”) on emotional exhaustion for each level of another factor (“negative automatic thoughts” or “positive automatic thoughts”). The effect of positive automatic thoughts was highly significant for the higher level of negative automatic thoughts ( $F [1,332] = 32.36, P = 0.00$ ) and barely significant at the 5% level for the lower level of negative automatic thoughts ( $F [1,332] = 4.32, P = 0.04$ ), while the effect of negative automatic thoughts was highly significant for the lower level of positive automatic thoughts ( $F [1,332] = 23.70, P = 0.00$ ) and not significant for the higher level of positive automatic thoughts ( $F [1,332] = 3.45, P = 0.06$ ).

### Cognitive model of burnout

Based on the analyses of the stressors, irrational beliefs, and automatic thoughts, which might affect burnout, a hypothetical model of three cognitive processes was prepared by using the individual observed variables (Fig. 1)

for an analysis of covariance structure. The latent variable of negative automatic thoughts and the observed variable of positive automatic thoughts were used. The parameters were estimated by the maximum likelihood estimation method. A comparison of the three models, based on the GFI, showed that model j had the lowest AIC and highest GFI (Table 6, Fig. 2). The GFI was considered to be acceptable, as shown by the data:  $\chi^2 = 241.83$ , d.f. = 72, GFI = 0.90, AGFI = 0.85, RMSEA = 0.084, and AIC = 307.83. Regarding the individual latent variables, positive standardized coefficients were found between stressors and irrational beliefs ( $P < 0.01$ ), irrational beliefs and negative automatic thoughts ( $P < 0.01$ ), and negative automatic thoughts and burnout ( $P < 0.01$ ), while negative standardized coefficients were found between irrational beliefs and positive automatic thoughts ( $P < 0.01$ ) and positive automatic thoughts and burnout ( $P < 0.01$ ). The effects of automatic thoughts were  $0.66 \times 0.25 = 0.17$  for “negative automatic thoughts” and  $-0.44 \times -0.11 = 0.05$  for “positive automatic thoughts”, which indicated that burnout was more strongly influenced by negative automatic thoughts. The direct effect between stressors and burnout was 0.68 and the indirect effect between irrational beliefs and automatic thoughts was  $0.62 \times 0.66 \times 0.25 \times -0.44 \times -0.11 = 0.005$ . This indicated a strong direct effect between stressors and burnout and a small indirect effect between irrational beliefs and automatic thoughts.

### Relationship between burnout and the intention to resign

“Want to quit working as a nurse” was stated by 72 (21%) of the 336 participants, “want to switch hospitals or departments” was stated by 93 (28%), and “want to continue working as a nurse” was stated by 115 (46%)

Table 5 Effects of automatic thoughts on burnout

Automatic thought	High NAT		Low NAT		Main effect (NAT) F (d.f. = [1, 332])	Main effect (PAT) F (d.f. = [1, 332])	Interaction F (d.f. = [1, 332])
	High PAT N = 91	Low PAT N = 83	High PAT N = 96	Low PAT N = 66			
Emotional exhaustion	Mean	17.00	20.67	15.84	23.76**	29.41**	5.81*
	SD	4.56	3.65	4.51			
Depersonalization	Mean	13.48	15.70	11.18	37.08**	6.03*	3.00
	SD	5.10	5.83	4.34			
Personal accomplishment	Mean	13.67	11.24	14.26	8.78**	19.09**	2.34
	SD	3.69	3.42	3.95			

\*P < 0.05, \*\*P < 0.01. NAT, negative automatic thoughts; PAT, positive automatic thoughts.

(Table 7). An examination of the relationship between burnout and the intention to resign in individual participants indicated that “want to quit working as a nurse” had a positive correlation with emotional exhaustion ( $P < 0.05$ ) and depersonalization ( $P < 0.01$ ) and a negative correlation with personal accomplishment ( $P < 0.05$ ), “want to switch hospitals or departments” had a positive correlation with emotional exhaustion ( $P < 0.05$ ), and “want to continue working as a nurse” had negative correlations with emotional exhaustion ( $P < 0.01$ ) and depersonalization ( $P < 0.01$ ) and a positive correlation with personal accomplishment ( $P < 0.05$ ). A significant odds ratio was found for all these relationships.

## DISCUSSION

### Effects of individual factors on burnout

Burnout has been reported to depend on personal factors, such as age and marriage, and vocational factors, such as position and working style. Many reports suggest that younger nurses have burnout more than older nurses and that unmarried nurses tend to have burnout more than married nurses. Regarding the vocational position, health staff experience burnout more than supervisors, such as managers and chief nurses, and three-shift (morning, evening, and night) workers experience burnout more than nurses with other working styles (Kitaoka-Higashiguchi *et al.*, 2004; Suzuki *et al.*, 2008; Tao & Kubo, 1996; Yamazaki *et al.*, 1999). This study suggested that burnout was more common in female nurses in their 20s who had worked in an obstetrics and gynecology department for 3 years. These results are similar to those of past studies and indicate that a stress management program should be developed for nurses in their 20s with clinical experience of 3 years.

### Irrational beliefs of nurses

Dependence, problem avoidance, and helplessness were found to be the irrational beliefs that affected burnout. These findings are similar to those of Fukui and Sakano (2000) regarding the irrational beliefs that were related to depression and anxiety. As burnout is related to depression (Amagasa, 2000), it can be assumed that such irrational beliefs will affect burnout.

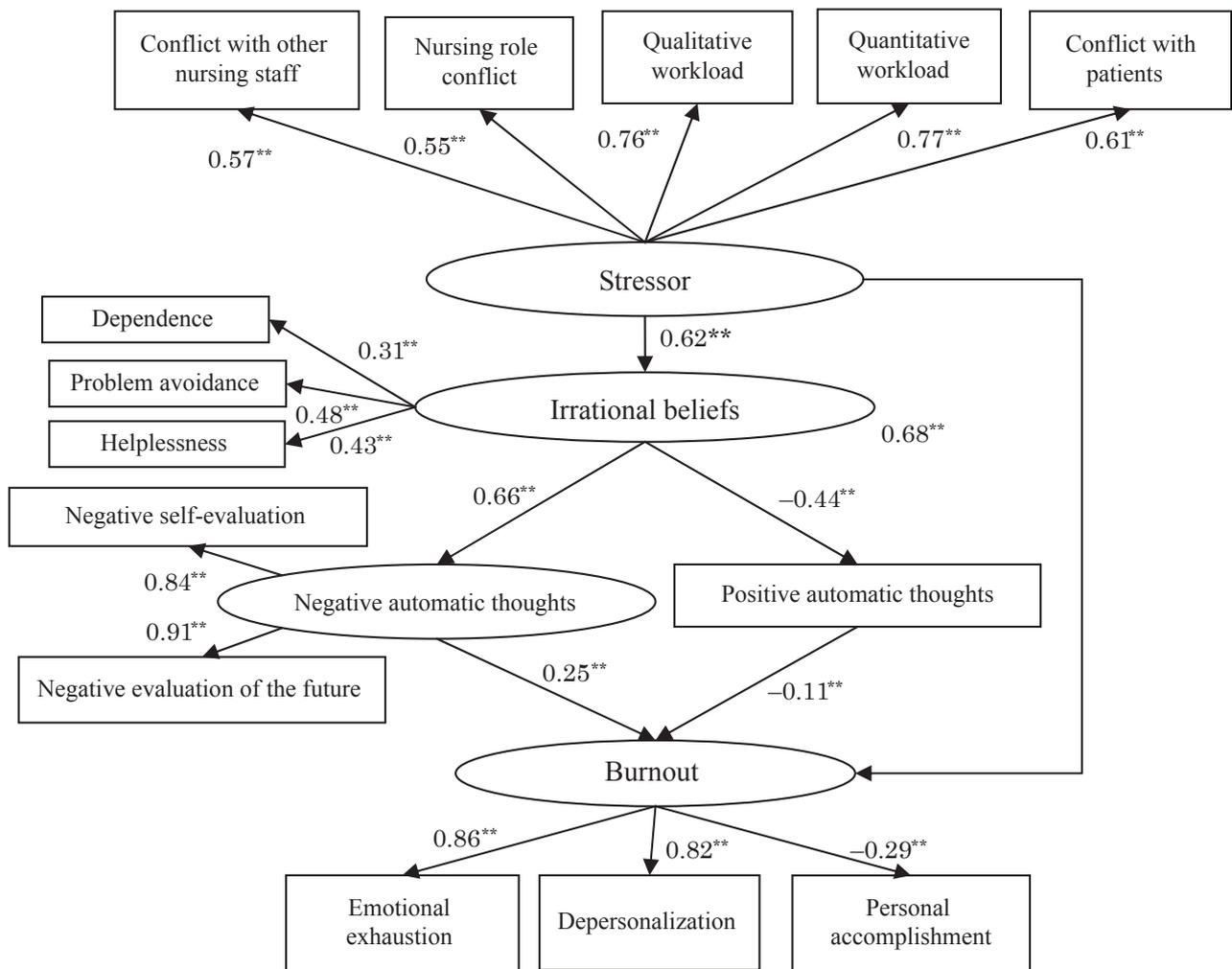
### Cognitive model of burnout

The automatic thoughts that might affect burnout showed a significant interaction with emotional exhaus-

**Table 6** Comparison of the indices of fit among the three models

Model	$\chi^2$	d.f.	GFI	AGFI	RMSEA	AIC
Direct effect and indirect effect	241.83	72	0.90	0.85	0.084	307.83
Stressor → irrational beliefs → automatic thoughts → burnout	289.03	73	0.88	0.82	0.094	353.03
Stressor → burnout → irrational beliefs → automatic thoughts	247.77	74	0.90	0.85	0.084	309.77

GFI, Goodness of Fit Index; AGFI, Adjusted Goodness of Fit Index; RMSEA, Root Mean Square Error of Approximation; AIC, Akaike's Information Criterion.



**Figure 2** Final adopted model. \*\* $P < 0.01$ .

tion. The analysis of covariance for automatic thoughts suggested a strong effect of negative automatic thoughts, indicating the importance of efforts to decrease these thoughts, as well as to increase positive automatic thoughts. This idea is similar to that of Kendall (1992) and a method to address this problem could decrease emotional exhaustion.

This study was based on the hypothesis that irrational beliefs and automatic thoughts might be involved in burnout. An analysis of covariance structure revealed a strong direct effect of the recognition of stressors on burnout. The model of cognitive action that was established by Beck (1990) was developed for patients with depression, whereas this study investigated nurses

**Table 7** Relationship between burnout and the intention to leave

Variable	Want to quit working as a nurse		Want to switch hospitals or departments		Want to continue working as a nurse	
	$\beta$	Odds ratio	$\beta$	Odds ratio	$\beta$	Odds ratio
Emotional exhaustion	0.13	10.14*	0.08	10.08*	-0.13	0.88**
Depersonalization	0.16	10.17**	0.08	0.99	-0.15	0.86**
Personal accomplishment	-0.10	0.91*	-0.01	0.99	0.09	10.09*

\* $P < 0.05$ , \*\* $P < 0.01$ .

without a diagnosis of depression. The stressors that were strongly related to emotional exhaustion, the main symptom of burnout, included qualitative and quantitative workload and conflict with patients and burnout was observed more frequently in young nurses. As emotional exhaustion was related to dependence and a sense of helplessness, the insufficient development of measures to control stress in young nurses was related to burnout. The lack of these measures also might be related to problem avoidance, affecting depersonalization.

Based on these data, we consider it to be necessary to increase the processing capability at work, the ability to cope with others at work, and the personal independence of young nurses. Strengthening the processing capability is an approach to “cognition” in order to avoid the recognition of stimulation as stress (Lazarus & Folkman, 1984), as well as to train persons to avoid the incorrect recognition of criticism in a vocational role as personal criticism (Hochschild, 2000). Therefore, our model, in which irrational beliefs and automatic thoughts are associated with exposure to stressors and burnout, forms a theoretical basis for cognitive action therapy for the prevention of burnout.

### Relationship of the intention to resign with burnout

An examination of the relationship between the intention to resign and burnout showed that the nurses who had hoped to leave their work might have had burnout, as also shown by Kubo (2007). Therefore, we suggest that the prevention of burnout is required to reduce turnover and that approaches for stress recognition are particularly important among the preventive measures.

### Limitations of the study and suggestions for a future study

Clarification of whether the irrational beliefs that affect burnout are a personal factor or beliefs that are created during working will allow the adjustment of basic education and in-service training for nurses. This and other

studies on burnout have been carried out with a cross-sectional design and it will be necessary to carry out a longitudinal study to clarify the process from the recognition of stress to burnout. Verification of the model in this study requires a demonstration that burnout is inhibited by an educational intervention for irrational beliefs and automatic thoughts.

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