RESEARCH ARTICLE

Temperament and professional quality of life among Japanese nurses

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Abstract

Aim: To investigate associations between temperament and professional quality of life among Japanese nurses.

Design: A descriptive-correlational study using self-administered anonymous questionnaires.

Methods: Questionnaires were collected from 1,267 nurses. We used analysis of covariance to examine associations between tendencies of temperament (depressive, cyclothymic, hyperthymic, irritable and anxious) and professional quality of life subscales (compassion satisfaction, burnout, compassion fatigue) first for all participants and then again after dividing the participants into two groups based on years of experience.

Results: Nurses' professional quality of life was associated with innate temperament and years of experience. Nurses with any of depressive, cyclothymic, irritable, or anxious tendencies showed significantly lower compassion satisfaction and higher burnout and compassion fatigue than those without these tendencies. Nurses with hyperthymic tendencies showed significantly higher compassion satisfaction and lower burnout than those without the tendency.

KEYWORDS
mental health, Nurses, professional quality of life, temperament

1 | INTRODUCTION

Professional quality of life (ProQOL) is an instrument used to assess the quality of life of helping professionals and comprises three subscales: compassion satisfaction (CS), burnout (BO) and compassion fatigue (CF) (Stamm, 2010). As awareness and understanding of trauma and the need for interventions for trauma victims increased from the late 1970s to the early 1980s, it was found that their work helping to alleviate the suffering of clients sometimes had a negative impact on professional helpers. This negative and undesired impact of caregiver's empathy is characterized by emotional, physical and mental exhaustion and has come to be recognized as the cost of caring, a concept called "compassion fatigue" (Figley, 1995). Joinson (1992) first drew attention to this issue in a study of burnout among emergency department nurses. Subsequently, the effects of professional compassion towards clients were modelled, leading to the development ProQOL, comprising a CS subscale measuring the positive outcomes of empathy towards clients and the BO and CF subscales measuring negative

outcomes (Figley, 1995; Figley & Stamm, 1996; Stamm, 2002, 2010). ProQOL involves aspects of individual personal character, exposure to primary and secondary trauma in work settings and aspects of work environment (Stamm, 2010). Previous studies have been conducted in various work settings, including emergency departments and facilities for cancer nursing, psychiatric nursing, paediatric nursing, geriatric nursing and induced abortion care, which have helped our understanding of nurses' ProQOL as a combination of associations between work environment and personal character (Galiana, Arena, Oliver, Sansó, & Benito, 2017; Kolthoff & Hickman, 2017; Mangoulia, Koukia, Alevizopoulos, Fildissis, & Katostaras, 2015; Mooney et al., 2017; Roney & Acri, 2018; Teffo, Levin, & Rispel, 2018; Wu, Singh-Carlson, Odell, Reynolds, & Su, 2016). However, these studies did not focus on associations between ProQOL and the nurses' own innate temperament. Innate, or personal, temperament is one of the foundational elements forming individual personal character, and we hypothesized that it is an important factor associated with nurses' ProQOL. Therefore, this study aimed to identify associations between temperament and ProQOL among Japanese nurses.

2 | BACKGROUND

Compassion is generally considered to have two main components: the affective feeling of caring for one who is suffering and the motivation to relieve that suffering (Halifax, 2012). Stamm (2010) defined the effects of compassion on helping professionals as having three subcomponents: CS, BO and CF. According to Stamm (2010), CS is the pleasure you derive from doing a good job; your job satisfaction comes from helping others. BO is a negative outcome that results from caring and is associated with feelings of hopelessness and difficulties in coping with work or in performing one's job effectively. Such negative feelings tend to develop over time and are associated with high workloads or a lack of support in the workplace. CF is a form of secondary traumatic stress that is related to exposure to traumatically stressful events at work, the effects of which may include anxiety, trouble sleeping, intrusive images or avoidant behaviour related to traumatic experiences. BO and CF are often interrelated, with CF often classified as a type of BO (Portnoy, 2011). A situation where BO and CF occur simultaneously often results in depression and lethargy in nurses, which in the long run may lead to lower workplace morale, increased absenteeism and attrition (Boyle, 2011; Jones & Gates, 2007; Portnoy, 2011). Therefore, addressing BO and CF in nurses and helping them enhance CS are critical to maintaining their mental health.

The ProQOL instrument was originally developed in English and eventually translated into many European languages as well as Japanese, and it has been used to assess nurses' ProQOL in many countries around the world. For example, a study about oncology nurses' ProQOL reported that nurses who had a high frequency of confronting death and who were highly trained appeared to achieve high levels of CS (Wu et al., 2016). Another study reported that

novice nurses had higher levels of BO and CF than experienced nurses (Hunsaker, Chen, Maughan, & Heaston, 22015; Kolthoff & Hickman, 2017). In addition, a study looking at different departmental affiliations found that ICU nurses had significantly lower levels of CS and higher levels of BO than oncology nurses (Mooney et al., 2017). While we know that ProQOL involves aspects of individual personal character and work environment (Stamm, 2010), few studies have focused on individual innate temperament and investigated its associations with ProQOL.

Cloninger, Svrakic, and Przybeck (1993) sorted personality along two dimensions: temperament and character. Temperament reflects variations in the dopaminergic, serotonergic and noradrenergic systems in the neurobiological system, is influenced by genes and contributes to behavioural decisions. Temperament is also based on emotions and is regarded as the character component that is unaffected by social and cultural learning. Character matures in adulthood under the accumulated effects of life experience and influences personal and social effectiveness as one's self-concept evolves. So, while temperament is innate and related to central nervous system activity and mental illness such as harm avoidance, novelty seeking and reward dependence, character is closer to an individual's identity that develops and matures in social settings and one's surrounding environment.

Akiskal, Akiskal, Haykal, Manning, and Connor (2005) and Akiskal, Mendlowicz, et al. (2005) developed the Temperament Evaluation of Memphis, Pisa, Paris and San Diego-Autoquestionnaire version (TEMPS-A) to measure human temperament and identified five affective temperaments: depressive, cyclothymic, hyperthymic, irritable and anxious. Each temperament has specific characteristics, which are listed in Table 1 (Akiskal, 1998; Akiskal, Akiskal, et al., 2005; Akiskal, Mendlowicz, et al., 2005; Tei-Tominaga, Akiyama, & Sakai, 2012). The TEMPS-A examined relations between temperament, suicidal risk and bipolar disorders and found that suicide attempts or ideation and bipolar disorders are associated with anxious, cyclothymic, depressive and irritable temperaments (Mitsui et al., 2017; Toda et al., 2018; Vázquez, Gonda, Lolich, Tondo, & Baldessarini, 2018). In addition, other studies in non-clinical fields investigated associations between nurses' temperament and depressive symptoms and reported that a hyperthymic temperament played a role in protecting subjects from stress and depression and that depressive, cyclothymic, irritable and anxious temperaments were significantly associated with burnout, depression and over-commitment (Deguchi et al., 2016; Jaracz et al., 2017; Kikuchi et al., 2014; Kikuchi, Nakaya, Ikeda, Takeda, & Nishi, 2012).

Given the above, it appears that nurses' original temperament constitutes a sensitivity towards compassion and may be related to ProQOL, which indicates satisfaction and stress. Findings of previous studies that found experienced nurses had better ProQOL than novice nurses (Hunsaker et al., 2015; Kolthoff & Hickman, 2017) suggest that years of experience may affect the association between temperament and ProQOL. Clarifying these associations could contribute to developing or improving mental health support systems focused on characteristics of nurses who have temperaments that

Temperament	Characteristics
depressive	Pessimistic; skeptical; incapable of having fun; preoccupied with inadequacy, failure, and negative events; given to worry; guilt-prone; conscientious; self-disciplining
cyclothymic	Labile self-esteem, overconfidence alternating with low self-confidence, alternating periods of unusually high and low professional and creative productivity, unexplained tearfulness alternating with extreme joyfulness
hyperthymic	Cheerful, highly active, leadership, risk-taking, stimulus-seeking, stress-resistant, extroverted, grandiose
irritable	Restless, dysphoric, broody, choleric
anxious	Worrying about mundane matters, preoccupation with possible or present external dangers to oneself or one's relatives, taking care of others, oversensitive, gastrointestinal symptoms

are associated with higher levels of BO or CF. This could help further increase awareness of TEMPS-A functionality as a screening tool of caregiver mental health.

2.1 | Research question

Are the temperaments of Japanese nurses (depressive, cyclothymic, hyperthymic, Irritable and anxious) associated with ProQOL?

Hypotheses 1. Nurses' original temperaments are associated with ProQOL. Specifically, nurses with any of depressive, cyclothymic, hyperthymic, irritable or anxious tendencies are higher levels of CS (a positive outcome of compassion) or BO and CF (negative outcomes of compassion), compared with those without these tendencies.

Hypotheses 2. Associations between nurse temperament and ProQOL vary depending on years of experience. While the association between temperament and ProQOL is relatively strong for the novice group, such an association cannot be said to exist with any certainty for the experienced group.

3 | THE STUDY

3.1 | Design

This descriptive-correlational study used self-administered anonymous questionnaires.

3.2 | Participants

To explore the relationship between temperament and QOL among general clinical nurses, we recruited nurses working at general hospitals as subjects for this study. To obtain a sample representative of the general hospital nurses in the Hokuriku region of Japan, we used a stratified sampling method to recruit from a national university hospital, a private university hospital, a prefectural hospital and a municipal hospital. Questionnaires were distributed to 2,004 nurses who had been working at these hospitals for a minimum of six months. We excluded nurses whose work experience was less than six months because they may not have had enough repeated exposure to the types of traumatic events that often contribute to CF and BO (Dominguez-Gomez & Rutledge, 2009). We received responses from 1,267 nurses (63.2%), of which 1,259 (62.8%) had no missing values for their demographic characteristics and were included for analysis.

3.3 | Data collection

Data were collected between December 2017 and January 2018. After we explained the purpose and methods of the study and obtained agreement from the Directors of Nursing at each participating hospital, we asked head nurses from each department to distribute written explanations and self-administered anonymous questionnaires to all applicable nurses in each department. We asked them to mail their completed questionnaires in a securely sealed self-addressed envelope within a month.

3.3.1 | Demographic characteristics

Demographic characteristics surveyed were sex, age, years of experience, job title, departmental affiliation, educational background, bereavement experience and presence or absence of family members with any disorders or serious illnesses.

3.3.2 | Measure of temperament

To measure temperament, we used the Japanese version of the TEMPS-A developed by Akiskal, Akiskal, et al. (2005) and Akiskal, Mendlowicz, et al. (2005), which assesses emotional, cognitive, psychomotor, interpersonal and vegetative dimensions. This instrument

has a total of 110 items that are sorted into five temperaments: depressive (21 items), cyclothymic (21), hyperthymic (21), irritable (21 for men, 22 for women) and anxious (26). We asked participants to respond to each question with a "Yes" or "No," and determined their temperament tendencies if they met the cut-off sum of "Yes" responses for each: 8 or more for depressive, 4 or more for cyclothymic, 6 or more for hyperthymic, 3 or more for irritable and 10 or more for anxious (Matsumoto et al., 2005).

3.3.3 | Measure of ProQOL

The ProQOL scale developed by Stamm (2010) was used to measure ProQOL. Because an official Japanese version of the ProQOL-5 has not been published, we translated the revised text in the ProQOL-5 into Japanese based on the Japanese version of the ProQOL-IV (Goto, 2005). As part of the process of translation, we had our revisions checked by a bilingual expert. We asked participants to respond to each item of the questionnaires based on their experiences over the past 30 days. The ProQOL instrument includes three subscales—compassion satisfaction (CS), burnout (BO) and compassion fatigue (CF)—comprising 30 items with 5-point Likert scale response options from 1 (Never) to 5 (Very often), with the scores for each subscale ranging from 1 to 50. Higher scores indicate higher levels of each tendency.

3.4 | Data analysis

The frequencies of demographic characteristics and each temperament of the TEMPS-A (depressive, cyclothymic, hyperthymic, irritable and anxious) were calculated.

We conducted one-way ANOVA and Bonferroni tests for multiple comparisons to compare the CS, BO and CF scores by demographic characteristics. Then, associations between each temperament of the TEMPS-A and the CS, BO and CF scores were examined by ANCOVA with covariates of sex, age, years of experience, departmental affiliation and job title. Then, we divided the study sample into two groups according to years of nursing experience: a novice group (less than 10 years) and an experienced group (more than 10 years) and we conducted ANCOVA for each group. We split the sample because previous studies had reported that ProQOL scores vary depending on years of experience (Hunsaker et al., 2015; Kolthoff & Hickman, 2017) and we wanted to better understand the characteristics of each group and to take them into consideration in clinical settings in the future.

Furthermore, we divided the independent variable (temperament) according to presence or absence and used it as a categorical variable because we wanted to first understand the distribution of nurses with the temperament that relates to their mental health and then investigate its associations with ProQOL. We used IBM SPSS ver. 22 for statistical analyses. The significance test levels were set to be two-tailed at 0.05.

3.5 | Validity, reliability and rigour

The following information about the two survey instruments we used was reported in previous studies. Spearman coefficients of the Japanese version of TEMPS-A are 0.79, 0.84, 0.87, 0.81 and 0.87 for depressive, cyclothymic, hyperthymic, irritable and anxious, respectively, and Cronbach alphas are 0.69, 0.84, 0.79, 0.83 and 0.87, respectively, which demonstrates good validity and reliability of the measures (Matsumoto et al., 2005). The validity and reliability of the ProQOL-5 have also been established, with Cronbach's alphas of 0.88, 0.75 and 0.81 for CS, BO and CF, respectively (Stamm, 2010). The Cronbach's alphas from this study's sample are 0.90, 0.73 and 0.82, for CS, BO and CF, respectively, which reflects internal consistency above the accepted standard.

3.6 | Ethical considerations

This study was approved by the institutional review board for medical studies at the author's home institution (#1216). Data were saved only in the researcher's study database, and participants' employers were not able to access and did not know who participated in the study. Written informed consent documents were provided to participants to explain that their participation would be voluntary that a declination to participate would not inconvenience them and that their privacy would be protected. We regarded completion and submission of the questionnaire as consent to participate.

4 | RESULTS

4.1 | Demographic characteristics

Table 2 shows frequencies of demographic characteristics and TEMPS-A temperaments. Most of the respondents were women (93%) and about two-thirds (65.5%) were either in their 20s (37.7%) or 30s (27.8%). Nearly half of respondents (608, 48.3%) reported working for less than 10 years. Years of experience ranged from 0.6 to 53.7 with a mean of 13.6 (SD 11.2). The numbers of nurses with each TEMPS-A tendency were as follows: 832 depressive (66.1%), 807 cyclothymic (64.1%), 327 hyperthymic (26%), 603 irritable (47.9%) and 315 anxious (24.5%). Among the respondents, 1,148 (91.2%) had one or more of the five temperaments.

4.2 | Associations between demographic characteristics and ProQOL

Table 3 shows associations between demographic characteristics and the ProQOL subscales.

Variables associated with CS were age ($p < .001$), years of experience ($p < .001$), departmental affiliation ($p = .04$), education

TABLE 2 Demographic characteristics (n = 1,259)

	N	%
Sex		
Male	88	7
Female	1,171	93
Age		
less than 30 years old	475	37.7
30 to 39 years old	350	27.8
40 to 49 years old	226	18
50 years old or older	208	16.5
Years of experience		
less than 10 years	608	48.3
10 to 19 years	302	24
20 to 29 years	184	14.6
30 years or more	165	13.1
Affiliation		
General ward	758	60.2
Emergency care centre	34	2.7
Obstetrics and gynaecology ward	50	4
Paediatrics ward	82	6.5
Psychiatric ward	46	3.7
Outpatient clinic	133	10.6
Operating room	95	7.5
Other	61	4.8
Educational background		
Professional school of nursing	712	56.6
Junior college	139	11
University	377	29.9
Graduate school	22	1.7
Assistant nursing school	9	0.7
Job title		
Staff	1,114	88.5
Management	145	11.5
Bereavement experience		
Present	943	74.9
Absent	316	25.1
Family members with disorders or serious illness		
Present	225	17.9
Absent	1,034	82.1
TEMPS-A (multiple choices)		
depressive	832	66.1
cyclothymic	807	64.1
hyperthymic	327	26
irritable	603	47.9
anxious	315	24.5

($p < .001$), job title ($p < .001$) and bereavement experience ($p = .001$). Regarding age groups, compared with the nurses in their 20s, nurses in the other age groups appeared to have significantly higher CS

scores. Similarly, compared with the group having less than 10 years of experiences, nurses more experience appeared to have significantly higher CS scores.

Variables associated with BO were age ($p < .001$), years of experience ($p < .001$), departmental affiliation ($p < .001$), education ($p = .001$) and job title ($p = .045$). For age, nurses in their 20s had significantly higher BO scores than those in the other age groups. Likewise, nurses with less than 10 years of experience had significantly higher BO scores compared with nurses having 10–19 years of experience and nurses aged 30 years or older. Variables associated with CF were age ($p = .030$), departmental affiliation ($p = .001$) and presence of family members with any disorders or serious illnesses ($p < .001$).

4.3 | Associations between temperament and ProQOL

Here, we show the association between temperament and ProQOL for all, giving consideration to various control factors (i.e. sex, age, years of experience, departmental affiliation and job title). CS scores of nurses with depressive, cyclothymic, irritable or anxious tendencies appeared to be significantly lower ($p < .001$, $p = .011$, $p < .001$, $p < .001$) than those of nurses without these tendencies. CS scores of nurses with hyperthymic tendency were significantly higher ($p < .001$) than those of nurses without that tendency. BO scores of nurses with depressive, cyclothymic, irritable or anxious tendencies appeared to be significantly higher ($p < .001$, $p < .001$, $p < .001$, $p < .001$) than those of nurses without these tendencies. BO scores of nurses with hyperthymic tendency were significantly lower ($p < .001$) than those of nurses without that tendency. CF scores of nurses with depressive, cyclothymic, irritable or anxious tendencies appeared to be higher ($p < .001$, $p < .001$, $p < .001$, $p < .001$) than those of nurses without these tendencies. No significant differences in CF scores were found between nurses with and without hyperthymic tendencies.

Next, we divided the sample into two groups based on years of experience: novice and experienced. In this case, because only the first class of years of experience was included in the group with less than ten years of experience, this was not used as a control factor. For the novice group, results of analysis showed the same outcomes as those of the entire group. Table 4 shows the associations between temperament and ProQOL among nurses in the novice group. CS scores of nurses with depressive, cyclothymic, irritable or anxious tendencies appeared to be significantly lower ($p < .001$, $p = .005$. $p < .001$, $p < .001$) than those of nurses without these tendencies. CS scores of nurses with hyperthymic tendency were significantly higher ($p < .001$) than those of nurses without that tendency. BO scores of nurses with depressive, cyclothymic, irritable or anxious tendencies appeared to be significantly higher ($p < .001$, $p < .001$, $p < .001$, $p < .001$) than those of nurses without these tendencies. And BO scores of nurses with hyperthymic tendency were significantly lower ($p < .001$) than those of nurses without that tendency. CF scores of nurses with depressive,

TABLE 3 Associations between demographic characteristics and ProQOL

	N	CS			BO			CF		
		mean ± SD	a	b	mean ± SD	a	b	mean ± SD	a	b
Demographic factors										
Sex										
Male	88	28.4 ± 5.2	.628		24.4 ± 3.9	0.831		22 ± 5.3	.598	
Female	1,171	28.7 ± 5.5			24.3 ± 4			22.3 ± 5.1		
Age										
less than 30 years old	475	27.7 ± 5.6	.000***	.044*	25 ± 4.1	0.000***	.004**	22.7 ± 5.2	.030**	.054
30 to 39 years old	350	28.7 ± 5.6		.000**	24.1 ± 4		.001**	21.8 ± 5.2		
40 to 49 years old	226	30 ± 5.0		.000***	23.8 ± 3.9		.002**	21.9 ± 5.2		
50 years old or older	208	29.7 ± 5.2			23.8 ± 3.9			22.6 ± 4.8		
Years of experience										
less than 10 years	608	28 ± 5.5	.000***	.051	24.8 ± 4	0.000***	.004**	22.5 ± 5.3	.127	
10 to 19 years	302	29 ± 5.7		.003**	23.8 ± 4.1		.003**	21.7 ± 5.1		
20 to 29 years	184	29.6 ± 4.8		.000***	24.4 ± 3.8			22.2 ± 5.4		
30 years or more	165	30.1 ± 5.3			23.6 ± 3.8			22.6 ± 4.4		
Affiliation										
General ward	758	28.6 ± 5.6	.04*	.052	24.6 ± 4.1	0.000***	.046*	22.7 ± 5.2	.000***	.018*
Emergency care centre	34	28.9 ± 4.0			23.2 ± 3.6		.023*	19.7 ± 4.9		.048*
Obstetrics and gynaecology ward	50	31 ± 5.2		.01*	23.3 ± 3.9		.01*	22.7 ± 4.7		
Paediatric ward	82	29.1 ± 4.9			23.5 ± 3.1		.009***	22.2 ± 4.8		
Psychiatric ward	46	28.8 ± 5.0			23.5 ± 4			20.3 ± 4.6		
Outpatient clinic	133	29 ± 5.4			23.6 ± 3.4			21.9 ± 4.9		
Operating room	95	27.6 ± 5.9			25.5 ± 3.8			21.4 ± 5.6		
Other	61	29.1 ± 4.8			23.2 ± 4.5			21.8 ± 4.8		
Educational background										
Professional school of nursing	712	28.7 ± 5.4	.000***	.018*	24.3 ± 4.0	.001**	.001**	22.1 ± 5.1	.105	
Junior college	139	30.3 ± 5.4		.000***	23.3 ± 3.9			21.8 ± 4.7		
University	377	28.0 ± 5.5			24.9 ± 4.1			22.8 ± 5.2		
Graduate school	22	31.2 ± 6.1			23 ± 4.0			22.2 ± 4.8		
Assistant nursing school	9	27.7 ± 3.8			25.1 ± 1.1			24.2 ± 5.5		

(Continues)

TABLE 3 (Continued)

	N	CS			BO			CF		
		mean ± SD	a	b	mean ± SD	a	b	mean ± SD	a	b
Job title										
Staff	1,114	28.4 ± 5.5	.000***		24.4 ± 4.1	.045**		22.3 ± 5.1	.491	
Management	145	30.1 ± 5.0			23.7 ± 3.7			22 ± 5		
Bereavement experience										
Present	943	29.0 ± 5.5	.001**		24.2 ± 4.1	.193		22.4 ± 5.1	.112	
Absent	316	27.8 ± 5.4			24.6 ± 3.8			21.9 ± 5.2		
Family members with disorders or serious illness										
Present	225	29.0 ± 5.7	.420		24.6 ± 4.3	.252		23.5 ± 5.1	.000***	
Absent	1,034	28.7 ± 5.5			24.3 ± 4.0			22.0 ± 5.1		

Abbreviation: SD, standard deviation.

[a] One-way ANOVA.

[b] Bonferroni tests conducted only for factors with significant differences found by one-way ANOVA.

*$p < .05$; **$p < .01$; ***$p < .001$.

cyclothymic, irritable or anxious tendencies appeared to be higher ($p < .001$, $p < .001$, $p < .001$, $p < .001$) than those of nurses without these tendencies.

Table 5 shows associations between temperament and ProQOL among nurses in the experienced group. CS scores of nurses with irritable tendency were significantly lower ($p = .038$) than those of nurse without the tendency and the scores of nurses with hyperthymic tendency were significantly higher ($p < .001$) than those of nurses without that tendency. On the other hand, no significant differences were demonstrated in CS scores between nurses with and without depressive, cyclothymic and anxious tendencies. BO scores of nurses with depressive, cyclothymic, irritable, or anxious tendencies were significantly higher ($p < .001$, $p < .001$, $p < .001$, $p < .001$) than those of nurses without these tendencies. BO scores of nurses with hyperthymic tendency were significantly lower ($p < .001$) than those of nurses without that tendency. CF scores of nurses with depressive, cyclothymic, irritable or anxious tendencies were significantly higher ($p < .001$, $p < .001$, $p < .001$, $p < .001$) than those of nurses without these tendencies.

5 | DISCUSSION

In this study, most (91.2%) of respondents had one or more of the five temperament tendencies, which is remarkably high. Comparisons of CS, BO and CF scores between those with and without tendencies for each temperament revealed significant associations.

In previous studies, nurses and nursing students were found to have a higher likelihood of depressive or anxious temperament compared with other groups (Dolenc, Sprah, Dernovšek, Akiskal, & Akiskal, 2013; Figueira et al., 2010; Jaracz et al., 2017). In the present study, 66.1% of participants had depressive tendencies and most of the sample had any one of the temperament tendencies. Jaracz et al. (2017) did not find any association between temperament and BO in their civil servant sample, which may suggest that some occupational characteristics of the nursing profession influence the association between temperament and BO. In addition to the fact that large proportions of nurses had temperaments that are subject to BO, such as depressive, cyclothymic, irritable or anxious, characteristics typical of nurses include empathy, highly altruistic ideals and pursuit of opportunities for caring (Eley, Eley, Bertello, & Rogers-Clark, 2012), all of which may contribute to situations where emotional depletion can easily occur.

Nurses with depressive, cyclothymic, irritable or anxious tendencies appeared to have significantly lower levels of CS and higher levels of BO and CF compared with those without any of these tendencies. Nurses with a hyperthymic tendency showed significantly higher CS and lower BO levels. While associations between cyclothymic or anxious nurses and burnout have already been reported in previous studies (Jaracz et al., 2017), in this study additional associations have become clear with regard to depressive, hyperthymic and irritable tendencies as well—in other words, associations between the five temperaments and burnout.

TABLE 4 Associations between TEMPS-A and ProQOL (novice group) (n = 608)

	CS		BO		CF	
	mean ± SD	p[a]	mean ± SD	p[a]	mean ± SD	p[a]
Temps-A						
depressive						
With	30.1 ± 5.3	.000***	24.5 ± 3.9	.000***	24.1 ± 5.2	.000***
Without	32.1 ± 5.7		21.3 ± 3.4		21.6 ± 5.0	
cyclothymic						
With	29.9 ± 5.5	.005**	25.0 ± 4.0	.000***	25.3 ± 5.0	.000***
Without	31.2 ± 5.4		22.5 ± 3.6		21.7 ± 5.1	
hyperthymic						
With	32.6 ± 5.7	.000***	22.5 ± 4.2	.000***	24.0 ± 5.5	.081
Without	29.5 ± 5.2		24.4 ± 3.8		23.1 ± 5.2	
irritable						
With	29.4 ± 5.5	.000***	25.2 ± 4.0	.000***	25.0 ± 5.3	.000***
Without	31.5 ± 5.3		22.5 ± 3.6		22.2 ± 4.9	
anxious						
With	29.5 ± 5.7	.000***	25.5 ± 4.1	.000***	26.2 ± 5.1	.000***
Without	31.4 ± 5.4		22.2 ± 3.6		21.2 ± 4.7	

Abbreviation: SD, standard deviation.
[a]Covariates: sex, age, affiliation and job title.
*p < .05; **p < .01; ***p < .001.

TABLE 5 Associations between TEMPS-A and ProQOL (experienced group) (n = 651)

	CS		BO		CF	
	mean ± SD	p[a]	mean ± SD	p[a]	mean ± SD	p[a]
TEMPS-A						
depressive						
With	29.0 ± 5.4	.175	25.1 ± 3.8	.000***	22.9 ± 5.0	.000***
Without	29.6 ± 5.2		22.7 ± 3.8		19.5 ± 4.2	
cyclothymic						
With	29.1 ± 5.7	.487	25.2 ± 3.9	.000***	23.0 ± 5.1	.000***
Without	29.4 ± 4.8		22.8 ± 3.6		19.4 ± 4.0	
hyperthymic						
With	31.4 ± 5.4	.000***	23.2 ± 3.9	.000***	21.7 ± 4.9	.458
Without	28.2 ± 5.1		24.7 ± 3.9		21.3 ± 5.0	
irritable						
With	28.8 ± 5.9	.038*	25.6 ± 3.7	.000***	23.0 ± 5.2	.000***
Without	29.6 ± 4.8		23.1 ± 3.8		20.4 ± 4.5	
anxious						
With	28.8 ± 6.2	.217	26.3 ± 4.0	.000***	25.3 ± 5.0	.000***
Without	29.4 ± 5.1		23.4 ± 3.7		20.5 ± 4.4	

Abbreviation: SD, standard deviation.
[a]Covariates: sex, age, experience, affiliation and job title.
*p < .05; **p < .01; ***p < .001.

In addition, as a phenomenon similar to burnout, significant correlations between depressive, cyclothymic, irritable and anxious temperaments and depressive symptoms have also been reported in studies of associations between nurses' temperaments and depression (e.g. Kikuchi et al., 2014). From these previous studies, we see that associations between nurses' temperament and negative

effects of compassion in the form of burnout and depression have already been revealed. However, in this study, by focusing on the association between temperament and ProQOL, we have revealed that five temperaments are related not only to BO, but to CS, as well. While no significant difference in CF was observed between nurses with and without Hyperthermic tendencies, nurses with such tendencies had high CS and low BO. The fact that we have focused in this study on ProQOL suggests that even if nurses with a hyperthymic tendency may experience compassion fatigue, they still have a high capacity to feel satisfaction, which helps to reduce burnout. It also became clear that nurses' ProQOL was associated with various professional factors such as care delivery factors, human resources management, patient factors, shift work and poor wages, as well as with various personal factors such as emotions and pressure (O'Callaghan, Lam, Cant, & Moss, 2019). In this study, it could be said that a new association has been clarified with temperament, which constitutes the basis of all personal factors.

Results of previous studies (Hunsaker et al., 2015; Kolthoff & Hickman, 2017) and this study's univariate analysis demonstrated differences in nurse ProQOL scores according to years of experience. So, after we obtained results of the overall analysis with years of experience as a covariate, we divided the sample into novice and experienced groups to examine the characteristics of each group. Results for the novice group appeared to be the same as those of the overall analysis: nurses with any of depressive, cyclothymic, irritable or anxious tendencies had lower CS and higher BO and CF than those without these tendencies. However, results for the experienced group were surprisingly different from those of the overall analysis as follows: while nurses with depressive, cyclothymic or anxious tendencies had higher BO and CF than those without these tendencies, no significant differences were observed with respect to CS. This finding suggests that even if they have a less desirable mental health temperament, an accumulation of experience could facilitate an increase in satisfaction. While previous studies have reported only that older nurses had higher CS and lower BO than younger nurses (Hunsaker et al. , , 2015; O'Callaghan et al., 2019), by stratifying subjects by age and analysing their association with temperament, we have revealed that CS was maintained for older nurses, even if they had temperaments regarded as being conducive to BO and CF. In other words, while the maintenance of CS does not necessarily mean an absence of mental health problems, mental health considerations seem to be important for nurses with depressive, cyclothymic or anxious temperaments, because their BO and CF may be high even if they are able to experience CS. On the other hand, just as Cohen, Leykin, Golan-Hadari, and Lahad (2017) have stated that CS could alleviate the negative aspects of CF even for those with a disposition conducive to BO or CF, it was suggested that increasing CS could contribute to the maintenance of positive mental health and being able to continue working as a nurse over an extended period.

Given the above, it was felt that focusing on temperament was useful when examining ProQOL for nurses. In other words, screening for the presence or absence of tendencies towards each temperament using TEMPS-A could be said to be a formidable clue for

supporting mental health. Then, focusing on those nurses with depressive, cyclothymic, irritable or anxious tendencies, we should help them mitigate CF and facilitate experiences that are likely to generate satisfaction. For nurses with a hyperthymic tendency, encouraging them to maintain and enhance their self-preserving outlook could help them assure continued good mental health. Furthermore, it is conceivable that changing mental health support measures for the novice group and the experienced group may result in more effective support. Veteran nurses are thought to have depressive, cyclothymic and anxious tendencies and to be able to experience CS even while simultaneously experiencing BO or CF. Accordingly, it may be effective to encourage improved mental health by placing an emphasis on reflecting on satisfying experiences as well as on the alleviation of mental fatigue. On the other hand, because younger nurses are more susceptible to the effects of temperament and have high BO and CF with low CS, it will be important to give systematic support that focuses first of all on alleviating mental fatigue, thus enabling younger nurses to experience satisfaction from compassion and to build constructive relationships with those in their care by devoting themselves to the development of a bedside manner. As described above, by understanding nurses' temperaments and relative years of experience and implementing support for their mental health, it will be possible to alleviate burnout and compassion fatigue while enhancing compassion satisfaction.

5.1 | Limitations

The subjects of this study were nurses working at general hospitals in the Hokuriku region of Japan, which may limit the generalizability of the results to nurses from different settings or with different cultural backgrounds. However, because the sample draws from several different types of general hospitals in our stratified sampling method, we believe that our findings are sufficiently generalizable to help us understand the current state of nurses working at general hospitals in this region. Another possible limitation is that we employed a cross-sectional research design. Further studies of associations between temperament and ProQOL should be conducted with data from diverse settings and cultural backgrounds and with longitudinal methods. In addition, this study used scales to measure complex inner human experiences, which might also be a methodological limitation. Further studies must be conducted to obtain a more qualitative understanding of the inner experiences related to temperament and ProQOL. In addition, we need to give mental health support to nurses with depressive, cyclothymic, irritable or anxious tendencies and investigate the effects of interventions in the future.

6 | CONCLUSION

This study demonstrated that nurses' ProQOL was associated with innate personal temperament and years of experience. We found that that nurses with depressive, cyclothymic, irritable or anxious

tendencies reported significantly lower levels of CS and higher levels of BO and CF than those without these tendencies and that nurses with a hyperthymic tendency reported significantly higher levels of CS and lower levels of BO. While the results for the novice group were similar to those for the entire group, the results for the experienced group were distinct in that no significant associations were observed between the CS results and the presence or absence of depressive, cyclothymic or anxious tendencies.

CONFLICT OF INTEREST

The authors declare no conflicts.

AUTHOR CONTRIBUTIONS

K.T., S.I., K.T.: Have made substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data; K.T., S.I., K.T., M.O., Y.M., C.K.: Been involved in drafting the manuscript or revising it critically for important intellectual content; K.T., S.I., K.T., M.O., Y.M., C.K.: Given final approval of the version to be published. Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content; K.T., S.I., K.T., M.O., Y.M., C.K.: Agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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