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Aggression in Teachers is Related to Role Conflict and Role Ambiguity as Occupational Stress

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Abstract

Background

Aggression in the workplace is increasingly recognized as a serious problem, but there are few studies about worker aggression toward outsiders in the workplace. We investigated the association between aggression and occupational stress among teachers.

Methods

This was a cross-sectional study of 1583 teachers, principals, and vice-principals. Aggression was measured using the Japanese version of the Buss-Perry Aggression Questionnaire (BAQ). The survey respondents were classified into tertiles according to the BAQ score. The high BAQ group was defined as the upper tertile for the BAQ total score (BAQ total score 62≦). Occupational stress was measured using the Japanese version of the Generic Job Stress Questionnaire. Comparisons among the groups were performed using multiple logistic regression analysis.

Results

Of the 1583 respondents, 488 were included in the high BAQ group. After adjusting for demographic and occupational variables, high role conflict and role ambiguity were significantly associated with belonging to the high BAQ group. In subscales of the BAQ, high role conflict and role ambiguity related to high levels of hostility, and physical aggression.

Conclusions

Occupational stress such as role conflict and role ambiguity was associated with aggression among teachers. It is necessary to reduce problems which relates to role conflict and role ambiguity for preventing teachers' aggression.

Key Words: Occupational stress; Aggression; Teachers; Role conflict; Role ambiguity

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Introduction

Aggression is increasingly recognized as a serious problem within the work environment. Workplace aggression began to receive attention in the 1980s after it was described by Leyman, and it became a major topic of research in the field of organizational psychology in the 1990s[1,2]. A report by the International Labour Organization noted that at least 10% of workers were exposed to workplace aggression[3], and a meta-analysis reported 11.9% of workers experienced workplace aggression once or more per week[4].

Workers in many types of jobs who deal with customers directly, can be exposed aggression by customers (e.g., verbal abuse, bullying, sexual harassment, threat of physical abuse or physical violence). Some researchers have reported that workers often experience direct aggression from their customers, students, or patients. They found: (a) that verbal abuse from customers causes emotional exhaustion; (b) that serving customers who feel entitled is stressful; and (c) that such experience is associated with a variety of negative employee outcomes, including physiological strain and burnout[5-8].

However, there are few studies about the workers' aggression toward customers. The aggression of workers toward customers is difficult to observe because it is prohibited and this leads to their huge disadvantage in the workplace. Among Japanese teachers, aggressive behavior toward students, such as corporal punishment, has become a problem in recent years. Therefore, we considered that it was important to study the aggression of teachers.

Many studies conducted throughout the world in recent years have highlighted that teaching is a highly stressful occupation. Teacher stress is defined as the experience of unpleasant and negative states, such as anger, tension, disappointment, or depression, which arise from teaching responsibilities[9]. According to Unterbrink et al, 22% of German teachers found their occupation extremely stressful[10]. Smith et al found that teachers reported higher levels of job-related stress than nurses, managers, and administrators[11]. Other research indicates that approximately 70% of teachers are under frequent stress, with students' discipline problems contributing the most to teacher stress and burnout[12,13].

Karasek found that the adverse health effects of workload were different among occupational groups and pointed out that adverse health effects of workload could be buffered by job control. This observation has been conceptualized as the Demand-Control (DC) model. According to this model, a combination of high job demand and low job control, called job strain, predicts adverse health effects. Job demand encompasses mental workload, organizational constraints on task completion, and conflicting demands. Job control refers to a worker's control over the performance of his or her own job. Social support at work has been added as a third dimension of the DC model. The job demand-control/support (DC/S) model of occupational stress is a major paradigm of contemporary work-stress research and intervention that guides the research on job stress[14-16]. The DC/S model is the most widely used theoretical frameworks that relates the characteristics of a job to health and wellbeing, e.g., in teachers[17,18].

Role stressors (including role conflict and role ambiguity) and job insecurity have received less attention in the research literature than the DC and DC/S models, despite the fact that these factors also are important work stressors for teachers and other workers. Role conflict may occur when individuals are torn between the conflicting demands placed upon them by others in the organization (e.g., being required to do things that they do not perceive to be part of their job), or when conflicts exist between their job and their personal beliefs. Therefore, stress may result from the inability to

meet these various expectations or demands. This conflict has been found to result in lower job satisfaction and higher job tension. Role ambiguity exists in the workplace when an employee does not have adequate information to carry out a task or does not fully understand the requirements of the task. The outcome of this can be job dissatisfaction, lack of self-confidence, feelings of futility, lack of self-esteem, depression, low motivation, and an increased inclination to leave the job. Other manifestations may be physiological (e.g., increased blood pressure and pulse rate)[19-21]. A series of studies reported that high role conflict and role ambiguity were associated with depressive mood and emotional exhaustion, one of the three dimensions of burnout. Inoue found that job control and role ambiguity can be important predictors of long-term sick leave owing to depressive disorders among male employees in manufacturing factories[22].

In this study, it is assumed that workplace stress is deeply related to aggression toward others by teachers. Therefore, we measured occupational stress, which is based on the DC/S model, role stressors, and aggression, among teachers using self-report questionnaire, to investigate the association between aggression and occupational stress.

Methods

Participants

This study was based on data from a cross-sectional study of public school teachers in a city in the Kansai region of Japan in August 2013. We mailed anonymous questionnaires and a return-mail envelope to 2876 teachers, including principals and vice-principals, who were attached to 60 kindergarten schools, 299 primary schools, 130 junior high schools, 21 high schools, and 11 special schools in the city. In addition, a letter was enclosed describing the aims and procedures of the study, particularly assuring that the survey was anonymous and voluntary, and that no individual would be identified in analyzing or reporting the data. A total of 1912 individuals returned the questionnaire in the sealed envelope, providing a response rate of 66.5%. After excluding teachers who had at least one missing entry in the questionnaire, the final number of respondents included in the analyses was 1583. The protocol of this study was approved by the Human Subjects Review Committee of Osaka City University (#1409).

Demographic and occupational variables

The demographic variables included age, sex, and marital status (currently married, unmarried, other). Occupational variables included the kinds of school where the respondents worked (kindergarten school, primary school, junior high school, high school, or special school), their occupational post (principal, vice-principal, or teacher), and overtime worked in the past month.

Buss-Perry Aggression Questionnaire (BAQ)

Aggression was measured using the Japanese version of the Buss-Perry Aggression Questionnaire[23]. The original version of the BAQ[24], a self-administered test, was designed to measure aggression as a personality trait. It consists of 24 items (including two immaterial items) that measure aggression with four subscales (anger, hostility, physical aggression, and verbal aggression). The validity and reliability of the Japanese version of the BAQ has been established[23]. Each item is rated on a five-point Likert-type scale ranging from (1) "extremely characteristic of me" to (5) "extremely uncharacteristic of me", to assess anger (e.g., "Some of my friends think I'm a hothead"), hostility (e.g., "Other people always seem to get the breaks"), physical aggression (e.g., "I have threatened people I know"), and verbal aggression (e.g., "I tell my friends openly when I disagree with them."). The scores in each category

are summed to produce total score (BAQ score) ranging from 22 to 110, with higher scores indicating greater aggression.

Generic Job Stress Questionnaire (GJSQ)

We measured occupational stress using the Japanese version of the Generic Job Stress Questionnaire[25], which has been shown to have sufficient reliability and validity. The GJSQ is a useful questionnaire for assessing various aspects of occupational stress, including occupational stress and stress reactions at the group and individual level. The original authors of the GJSQ[26] permit the use of the measure's independent subscales for assessing depressive symptoms and occupational stress, and we used four subscales to assess occupational stress (job control, quantitative workload, role conflict, role ambiguity) and we used three measures of social support (from supervisors, from co-workers and from family or friends) as buffering factors, based on the results of previous studies[27,28]. Quantitative workload is a four-item scale that measures the amount of work a person has to deal with on a daily basis. Job control is a 16-item scale that assesses how much the individual feels that his or her tasks, workplace setting, and decisions at work are controllable. Role conflict is an eight-item scale that measures how often workers experience role conflict with each other. Role ambiguity is a six-item scale that measures how clearly the worker understands what is expected of him or her for adequately performing a role or task. The amount of social support the respondents received from supervisors, co-workers, and family or friends was measured by a four-item scale. The item descriptions of quantitative workload, role conflict, and role ambiguity are a negatively oriented, so that higher scores indicate greater stress. In contrast, the item descriptions of job control and social support are positively oriented, so that higher scores indicate lower stress.

Definition

Participants were classified into tertiles according to the BAQ score. The high BAQ group, which was morbidity, was defined as the upper tertile for the BAQ total score (BAQ total score 62≦). Similarly, in each subscale, the high group was defined as the upper tertile for the BAQ subscale score. (Anger 16≦, Hostility 19≦, Physical aggression 16≦, Verbal aggression 16≦). Furthermore, participants were also grouped into quartiles according to the GJSQ score. The lowest quartile was classified into Quartile 1 and the higher quartiles were classified into Quartile 2-4 consecutively.

Statistical analysis

Independent t-tests were used to examine differences in respondent characteristics and GJSQ scores among groups. Univariate logistic regression analyses were used to estimate the odds ratios (OR) for belonging to the high BAQ group based on seven GJSQ subscales (job control, quantitative workload, role conflict, role ambiguity, social support from supervisors, social support from co-workers, social support from family or friends). A multivariate model was subsequently used to estimate the OR for belonging to the high BAQ and its subscale group, based on demographic variables (sex, age, and marital status) and occupational variables (type of school, job title, and overtime), and the seven GJSQ subscales. We examined the significance of the two-factor interaction terms between sex, age, marital status, types of school, job title, overtime, and the seven GJSQ subscales. However, none of these interactions was significant. All statistical analyses were performed using the Statistical Package for the Social Sciences version 22.0 (IBM Software Group, Chicago, IL).

Table 1. Respondent characteristics

	Total (%)	Male	Female
Number of respondents	1583	877	706
Marital status			
Married	1071 (67.7%)	735	336
Unmarried	429 (27.1%)	119	310
Other	83 (5.2%)	23	60
Types of school			
Kindergarten	168 (10.6%)	5	163
Elementary school	665 (42.0%)	397	268
Junior high school	490 (31.0%)	311	179
High school	125 (7.9%)	96	29
Special school	135 (8.5%)	68	67
Job title			
Principals	263 (16.6%)	211	52
Vice-principals	285 (18.0%)	244	41
Teachers	1035 (65.4%)	422	613
Overtime (Hours)			
<46	833 (52.6%)	360	473
46-80	450 (28.4%)	291	159
>80	300 (19.0%)	226	74

Results

Table 1 shows the respondents' characteristics. The respondents were 877 males (55.4%) and 706 females (44.6%), whose mean age was total 44.4 years (SD=11.7): males=47.1 years (SD=10.6); females=44.1 years (SD=12.1). Just over two-thirds (67%) of the survey participants were married. Most of the participants (42%) worked in elementary schools and most of the participants who worked in kindergarten were women. Two-thirds of the participants held the job title of teacher. About 50% subjects worked overtime for more than 46 hours per month.

Table 2 shows the scores on the BAQ and its subscales (anger, hostility, physical aggression and verbal aggression). The mean of the total BAQ score was 56.5 (SD=10.6), and the means of BAQ subscales were: 13.3 (SD=3.8) for anger; 16.3 (SD=4.2) for hostility; 13.0 (SD=4.6) for physical aggression; and was 13.9 (SD=3.3) for verbal aggression. The scores on the BAQ and its subscales for female tended to be lower than those for male in whole.

Table 3 shows each GJSQ scores for all participants and the GJSQ scores for the upper tertile and other groups formed on the BAQ and each subscale score. The analyses revealed significant difference between the high and low BAQ groups for quantitative workload, social support from co-workers, social support from family or friends, role conflict, and role ambiguity. There were significant differences on all the GJSQ scores between the high and low groups for hostility. As well as BAQ, GJSQ score of upper tertile was higher than this of other group in quantitative workload, role conflict, and role ambiguity. Conversely, GJSQ score of upper tertile was higher than this of other group in job control and social support, which was deferent from BAQ and other subscales.

Table 4 shows the results of the univariate and multivariate logistic regression analyses examining the association between GJSQ scores and BAQ. Higher score for role conflict was significantly associated with an increased risk of belonging to the high BAQ group among the quartile 2 (OR=1.58), the quartile 3 (OR=2.74), and the highest quartile (OR=3.74). Higher score for role

Table 2. Buss-Perry Aggression Questionnaire and subscale scores

Score (range)	N	(%)	Scores	Male	Female
Total (22-110)	1583		56.5±10.6	58.1±10.6	54.6±10.3**
<62	1094	69.1%	51.0±7.0		
62≦	489	28.6%	68.8±6.1		
Anger (5-25)			13.3±3.8	13.6±3.6	12.9±3.9**
<16	1160	73.3%	11.6±2.6		
16≦	423	26.7%	18.0±2.0		
Hostility (6-30)			16.3±4.2	16.4±4.0	16.2±4.3
<19	1166	73.7%	14.5±2.9		
19≦	417	26.3%	21.5±2.6		
Physical aggression (6-30)			13.0±4.6	13.9±4.7	11.9±4.1**
<16	1130	71.4%	10.7±2.8		
16≦	453	28.6%	18.7±2.7		
Verbal aggression (5-25)			13.9±3.3	14.2±3.2	13.5±3.4**
<16	1094	69.1%	12.3±2.4		
16≦	489	30.9%	17.6±1.7		

Data are expressed as mean±SD. The t-test was used for statistical comparison between males and females. Significant p values denoted in the table are **p<0.01.

Table 3. Generic Job Stress Questionnaire score according to Buss-Perry Aggression Questionnaire and subscale scores

		BAQ		Anger	
	N=1583	<62	62≦	<16	16≦
Job Control	44.9±11.5	45.2±11.4	44.1±11.8	45.1±11.2	44.3±12.3
Quantitative Workload	41.3±7.3	40.9±7.2	42.2±7.3***	40.9±7.2	42.4±7.4***
Social support from superior	13.8±4.5	13.9±4.6	13.5±4.2	13.8±4.5	13.7±4.3
Social support from coworker	15.1±3.6	15.2±3.6	14.8±3.5*	15.2±3.6	14.9±3.7
Social support from family or friends	16.3±3.1	16.4±3.0	15.9±3.2**	16.3±3.1	16.2±3.1
Role Conflict	30.0±8.5	28.6±8.6	33.0±7.5***	29.2±8.3	32.2±8.4***
Role Ambiguity	19.2±5.6	18.6±5.4	20.7±5.9***	18.9±5.5	20.1±6.0***
	Hostility		Physical aggression		Verbal aggression	
	<19	19≦	<16	16≦	<16	16≦
Job Control	46.0±11.1	41.8±12.0***	45.2±11.5	44.2±11.6	43.8±11.1	47.4±12.0***
Quantitative Workload	40.6±7.2	43.2±7.1***	41.3±7.2	41.3±7.4	41.2±7.2	41.6±7.5
Social support from superior	14.0±4.5	13.2±4.3***	13.8±4.6	13.8±4.0	13.7±4.5	13.9±4.5
Social support from coworker	15.4±3.5	14.2±3.8***	15.2±3.7	14.9±3.4	15.0±3.6	15.2±3.7
Social support from family or friends	16.4±3.0	15.8±3.3***	16.4±3.1	16.0±3.1**	16.2±3.1	16.5±3.0
Role Conflict	28.3±8.1	34.5±7.9***	29.1±8.6	32.1±7.7***	30.2±8.5	29.5±8.5
Role Ambiguity	18.5±5.2	21.4±6.3***	18.7±5.5	20.4±5.7***	19.9±5.6	17.7±5.5***

Data are expressed as mean±SD. The t-test was used for statistical comparison between high group and low group: *p<0.05, **p<0.01, ***p<0.001.

ambiguity was significantly associated with an increased risk of belonging to the high BAQ group among the highest quartile (OR=1.83). Job control, quantitative workload, and social supports were not related to risk of belonging to the high BAQ group. After adjusting for demographic variables and

Table 4. Multiple logistic regression: estimated odds ratios for high Buss-Perry Aggression Questionnaire score according to occupational stress

	Crude Model		Adjusted model †	
Occupational stress	OR	(95% CI)	OR	(95% CI)
Job control				
Quartile 1 (≦37)	0.86	(0.61-1.23)	0.73	(0.50-1.07)
Quartile 2 (38-45)	0.92	(0.65-1.30)	0.81	(0.56-1.17)
Quartile 3 (46-52)	1.05	(0.75-1.47)	0.96	(0.68-1.36)
Quartile 4 (53≦)	1.00		1.00	
Quantitative workload				
Quartile 1 (≦36)	1.00		1.00	
Quartile 2 (37-42)	0.90	(0.66-1.23)	0.89	(0.64-1.23)
Quartile 3 (43-47)	0.89	(0.65-1.24)	0.90	(0.64-1.27)
Quartile 4 (48≦)	1.10	(0.79-1.52)	1.15	(0.79-1.67)
Social support from superior				
Quartile 1 (≦11)	1.27	(0.88-1.84)	1.54	(1.01-2.36)*
Quartile 2 (12-15)	1.32	(0.94-1.85)	1.40	(0.98-2.01)
Quartile 3 (16-17)	1.19	(0.81-1.73)	1.21	(0.82-1.77)
Quartile 4 (18≦)	1.00		1.00	
Social support from coworker				
Quartile 1 (≦13)	0.79	(0.53-1.17)	0.87	(0.57-1.32)
Quartile 2 (14-16)	0.78	(0.54-1.12)	0.83	(0.57-1.21)
Quartile 3 (17-18)	0.82	(0.54-1.22)	0.85	(0.56-1.28)
Quartile 4 (19≦)	1.00		1.00	
Social support from family or friends				
Quartile 1 (≦14)	1.15	(0.79-1.68)	1.06	(0.72-1.57)
Quartile 2 (15-17)	1.03	(0.72-1.48)	0.97	(0.67-1.41)
Quartile 3 (18-19)	1.07	(0.74-1.54)	1.05	(0.72-1.53)
Quartile 4 (20≦)	1.00		1.00	
Role conflict				
Quartile 1 (≦24)	1.00		1.00	
Quartile 2 (25-30)	1.58	(1.11-2.26)*	1.54	(1.07-2.21)*
Quartile 3 (31-36)	2.74	(1.94-3.88)**	2.77	(1.94-3.95)**
Quartile 4 (37≦)	3.24	(2.22-4.74)**	3.26	(2.20-4.83)**
Role ambiguity				
Quartile 1 (≦15)	1.00		1.00	
Quartile 2 (16-19)	0.88	(0.63-1.24)	0.81	(0.58-1.14)
Quartile 3 (20-23)	1.28	(0.90-1.81)	1.11	(0.77-1.59)
Quartile 4 (24≦)	1.83	(1.26-2.65)**	1.60	(1.08-2.36)*

*$p<0.05$, **$p<0.01$. † Adjusted for sex, age, marital status, types of school, job title, and overtime. OR, Odds ratio; and CI, Confidence Interval.

occupational variables, Higher score for role conflict was significantly associated with an increased risk of belonging to the high BAQ group among the quartile 2 (OR=1.54), the quartile 3 (OR=2.77), and the highest quartile (OR=3.26). Higher score for role ambiguity was significantly associated with an increased risk of belonging to the high BAQ group among the highest quartile (OR=1.60).

Table 5 shows the results of the multivariate logistic analyses to examine the association between GJSQ scores and BAQ subscales: anger, hostility, physical aggression, and verbal aggression. After adjusting for demographic variables and occupational variables, lower score for job control was

Table 5. Multiple logistic regression: estimated odds ratios for high anger, hostility, physical aggression, and verbal aggression scores according to occupational stress (adjusted model)

	Anger †	Hostility †	Physical aggression †	Verbal aggression †
Occupational stress	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Job control				
Quartile 1 (≦37)	0.86 (0.60-1.25)	1.09 (0.73-1.63)	0.85 (0.58-1.25)	0.56 (0.39-0.80)**
Quartile 2 (38-45)	0.76 (0.53-1.09)	0.98 (0.66-1.45)	0.93 (0.64-1.35)	0.75 (0.54-1.05)
Quartile 3 (46-52)	0.77 (0.54-1.09)	0.65 (0.44-0.97)*	1.01 (0.71-1.45)	0.68 (0.50-0.94)**
Quartile 4 (53≦)	1.00	1.00	1.00	1.00
Quantitative workload				
Quartile 1 (≦36)	1.00	1.00	1.00	1.00
Quartile 2 (37-42)	1.18 (0.85-1.65)	1.45 (1.01-2.09)*	0.83 (0.60-1.15)	1.05 (0.77-1.43)
Quartile 3 (43-47)	1.23 (0.87-1.74)	1.56 (1.07-2.26)*	0.62 (0.44-0.88)**	1.15 (0.83-1.60)
Quartile 4 (48≦)	1.32 (0.90-1.94)	1.53 (1.01-2.32)*	0.78 (0.53-1.16)	1.45 (1.00-2.11)
Social support from superior				
Quartile 1 (≦11)	1.37 (0.89-2.11)	1.29 (0.83-2.03)	1.37 (0.89-2.12)	0.88 (0.58-1.33)
Quartile 2 (12-15)	1.48 (1.03-2.13)*	0.90 (0.61-1.34)	1.29 (0.89-1.87)	1.08 (0.77-1.52)
Quartile 3 (16-17)	1.09 (0.74-1.61)	1.21 (0.80-1.83)	1.21 (0.82-1.79)	0.83 (0.57-1.19)
Quartile 4 (18≦)	1.00	1.00	1.00	1.00
Social support from coworker				
Quartile 1 (≦13)	0.77 (0.50-1.17)	1.69 (1.07-2.68)*	0.94 (0.61-1.45)	0.92 (0.61-1.38)
Quartile 2 (14-16)	0.81 (0.56-1.19)	1.09 (0.72-1.67)	0.91 (0.61-1.34)	1.02 (0.71-1.46)
Quartile 3 (17-18)	0.85 (0.56-1.27)	1.30 (0.83-2.06)	0.85 (0.55-1.29)	0.94 (0.64-1.38)
Quartile 4 (19≦)	1.00	1.00	1.00	1.00
Social support from family or friends				
Quartile 1 (≦14)	0.95 (0.64-1.41)	1.00 (0.66-1.53)	1.05 (0.70-1.57)	0.97 (0.66-1.42)
Quartile 2 (15-17)	1.02 (0.71-1.48)	1.06 (0.71-1.58)	0.98 (0.67-1.44)	1.09 (0.76-1.55)
Quartile 3 (18-19)	1.04 (0.71-1.51)	0.94 (0.62-1.42)	1.16 (0.79-1.72)	1.31 (0.92-1.86)
Quartile 4 (20≦)	1.00	1.00	1.00	1.00
Role conflict				
Quartile 1 (≦24)	1.00	1.00	1.00	1.00
Quartile 2 (25-30)	1.21 (0.85-1.71)	1.84 (1.22-2.78)**	1.31 (0.91-1.87)	1.09 (0.80-1.49)
Quartile 3 (31-36)	1.75 (1.23-2.47)**	2.64 (1.76-3.96)**	2.01 (1.40-2.87)**	1.11 (0.81-1.54)
Quartile 4 (37≦)	2.19 (1.49-3.21)**	6.19 (4.02-9.53)**	2.15 (1.45-3.20)**	1.12 (0.78-1.63)
Role ambiguity				
Quartile 1 (≦15)	1.00	1.00	1.00	1.00
Quartile 2 (16-19)	0.94 (0.67-1.33)	0.97 (0.66-1.42)	0.97 (0.69-1.38)	0.79 (0.58-1.06)
Quartile 3 (20-23)	1.09 (0.75-1.57)	1.48 (1.00-2.20)	1.18 (0.81-1.71)	0.55 (0.39-0.77)**
Quartile 4 (24≦)	1.23 (0.82-1.83)	1.58 (1.03-2.41)*	1.61 (1.08-2.42)*	0.38 (0.25-0.56)**

*p＜0.05, **p＜0.01. † Adjusted for sex, age, marital status, types of school, job title, and overtime. OR, Odds ratio; and CI, Confidence Interval.

significantly associated with an reduced risk of belonging to the high verbal aggression group among the lowest quartile (OR=0.56) and the quartile 3 (OR=0.68). In the hostility, higher score for quantitative workload among other groups significantly increased ORs compared with lowest group. Conversely, in the physical aggression, lower score for quantitative workload among the quartile 3 significantly reduced OR compared with lowest group. Lower level of social support from superior was significantly associated with increased risk of belonging to the high anger group among the quartile 2 (OR=1.48). Lower level of social support from coworker was significantly associated with

increased risk of belonging to the high hostility group among the lowest quartile (OR=1.69). In the anger, the hostility, and the physical aggression, higher score for role conflict among other groups was significantly associated with increased ORs compared with the lowest group. Role ambiguity in the highest group correlated significantly with increased ORs in the hostility, the physical aggression, and the verbal aggression, although the verbal aggression showed opposite direction compared with other groups. Social support from family was not related with BAQ subscale.

Discussion

We have examined the relationships between occupational stress, based on the DC/S model, role stressors, and aggression among teachers. Few studies have examined the context of the association between teachers' aggression and occupational stress. The current study showed there is a relationship between higher aggression and two role factors, i.e. role conflict and role ambiguity, by using multivariate logistic analysis. Higher scores on the BAQ subscales of anger, hostility, and physical aggression were related to higher role conflict and role ambiguity. Only verbal aggression showed reversed results, in which lower scores were related to higher role ambiguity. Our results suggest that occupational stress is a predictor of increased risk of workers' aggression toward outsiders in the workplace.

Some previous studies have focused on the role problems of teachers, in particular, the association of role conflict and role ambiguity with burnout. Burnout has been studied most often in terms of its three dimensions: emotional exhaustion, depersonalization, and diminished personal accomplishment[29]. Schwab found that role conflict and role ambiguity explained a significant amount of the variance in feelings of emotional exhaustion and negative attitudes toward students[30], and Jackson found that emotional exhaustion was strongly associated with role conflict[31]. Bedi reported that there was a relationship between aggression and two of the three dimensions of burnout, emotional exhaustion, and depersonalization[32]. We suspected that burnout might mediate the association between role stress and three of the four subscale of aggression, i.e., anger, hostility, and physical aggression. A previous study of ours found associations of role conflict and role ambiguity with depressive symptoms in teachers[18]. Hence, depressive symptoms might also mediate the association between role stress and aggression.

Hakon et al have shown role conflict is important risk factors for developing psychological distress in a longitudinal study of workers in Norway. Furthermore, they estimated the population-attributable risk for developing psychological distress was 5.19% for low job control and 5.62% for high role conflict that these factors were closely related[33]. In the current study, high role conflict was related to a higher odds ratio for belonging to the high BAQ group, which indicates that role conflict is closely related to psychological distress.

Role ambiguity was significantly related to most of the variables measured by the BAQ subscales. High role ambiguity had a low odds ratio for belonging to the high verbal aggression group. The statements measuring verbal aggression included "I often find myself disagreeing with people" and "When people annoy me, I may tell them what I think of them". Therefore, the measures of verbal aggression might include a positive aspect of assertiveness in expressing one's opinion clearly to others. We suppose that the distress induced by high role ambiguity, as mentioned above, might make individuals less assertive and it may have led to the opposite result. In addition, there may be effects of the Japanese cultural background. In Japan, the frequent expression of contrary opinions

and assertiveness do not necessarily reflect a good attitude.

We expected that occupational stress was closely associated with aggression, based on the DC/S model. However, we did not find a strong association between BAQ and occupational stress. High social support did not show a buffering effect, and high quantitative workload did not show any association with BAQ. In the BAQ subscale, lower job control reduced ORs of belonging to the high verbal aggression group. In the DC/S model, low job control induces distress in the workplace, which is likely to develop depressive state or burnout[34]. Our finding on the association between job control and verbal aggression was the opposite of what is predicted by the model. The Japanese studies on occupational stress and burnout found that excess job control induced the requirement of the more various responsibility and excess workload, and this developed physical and psychological exhaustion among public officers and teachers[35,36]. Based on our results, high job control might lead to verbal aggression by mediating exhaustion. Therefore, high job control does not necessarily mean low occupational stress. However, higher quantitative workload increased ORs of belonging to the high hostility group and reduced ORs of belonging to the high physical aggression group. Therefore, DC/S model can partially explain BAQ subscales.

Increasing aggression among teachers might be a risk for developing workplace bullying, corporal punishment, deterioration of interpersonal relationships with students and parents, decreasing ability to work, depression, burnout, and declining teaching quality. As mentioned above, our findings showed that making an effort to reduce role conflict was relevant for preventing the aggressive behavior of teachers and that making an effort to reduce role ambiguity made a considerable contribution. To reduce role conflict and role ambiguity, it is important to receive a necessary and compatible assignments with adequate help, resources and materials to execute the assignments without breaking the rules or policies and to make to keep educational priorities about the job content of a teacher in clear focus. Further studies are needed to study effective interventions to reduce the aggression of teachers.

Finally, some possible limitations of the study should be mentioned. First, it used a cross-sectional design; therefore, the direction of causality could not be determined. We plan to conduct a longitudinal follow-up study of the aggression of teachers in the future, and to examine further the association of occupational stress and aggression. Second, all the data were collected by self-reports; thus, the results may be influenced by personality differences or response tendencies. To evaluate aggression accurately might require studies that use semi-structured interviews conducted by experts. Third, the moderate response rate for our survey questionnaire (66.5%) might result in selection bias. Finally, this study was conducted in limited area of a city in Japan. Because there may be regional differences in Japan, it will be necessary to study teachers in other areas in the future.

In conclusion, this study demonstrated that occupational stress, in the form of high role conflict and role ambiguity, is associated with aggression among teachers. To reduce the problems associated with role conflict and role ambiguity, it is necessary to be given the appropriate assignments without breaking the rules or policies.

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