

An exploratory questionnaire survey about overwork on mental health of Japanese elementary and junior high school teachers

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Abstract

Purpose – Occupational stress-relating overwork among teachers predispose to mental disorders and eventually lead to long leave from work. Although some studies have been conducted to assess these problems among elementary and junior high school teachers, a quantitative investigation has been limited to date. In this study, the authors sought to explore the association between overwork and mental stress among Japanese elementary and junior high school teachers.

Design/methodology/approach – An exploratory cross-sectional questionnaire survey was carried out on 294 Japanese elementary and junior high school teachers. The respondents filled a questionnaire on personal data, and occupational stress reaction was evaluated by Japanese version of Brief Job Questionnaire. Multiple linear regression model was used to evaluate the association between overwork information and psychological and physical stress.

Findings – Working during holidays was significantly likely to increase psychological and physical stress reactions among elementary school teachers (adjusted mean difference = -1.67 , 95% CI: -2.81 to -0.54) and junior high school teachers (adjusted mean difference = -5.24 , 95% CI: -9.60 to -0.87). A weakly positive association was found between high risk of psychological and physical stress and marital status ($p = 0.005$), teacher in charge of class ($p = 0.015$) among elementary school teachers.

Originality/value – This study indicated an association between working during holidays and psychological and physical stress reactions among elementary and junior high school teachers after adjusting for sociodemographic and work-related status. Further study for the confirmation of this finding is warranted.

Keywords Overwork, Questionnaire survey, Cross-sectional study, Elementary and junior high school teachers, Mental stress

Paper type Research paper

Introduction

The increasing numbers of school teachers taking leave from work due to mental disorders has become a serious problem in Japan. According to the 2013 final report of the Ministry of Education, Culture, Sports, Science and Technology, the number of teachers taking leave has increased for seven consecutive years from 1992 (1,111 teachers [0.11%]) to 2009 (5,458 teachers [0.60%]) (Ministry of Education, Culture, Sports, Science and Technology, 2013). Few studies have targeted Japanese teachers; however, previous studies have shown that overwork (Bannai *et al.*, 2015), reduced job satisfaction, shorter time spent on leisure (Nagai *et al.*, 2007), high role ambiguity, high role conflict, high quantitative workload and low social support from family or friends (Nakada *et al.*, 2016) were associated with a negative impact on mental health among Japanese teachers. However, it is still unclear which are the chief influencing factors of Japanese teachers' stress levels.

(Information about the authors can be found at the end of this article.)

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Against the background situation in Japan, the Japan Mutual Aid Association of Public School Teachers created a survey questionnaire to clarify the cause of the mental health problems of Japanese public elementary and junior high school teachers. Here, we report the result of an exploratory analysis for test the hypothesis that overwork would increase the risk of psychological and physical stress among Japanese public school teachers based on the data from approximately 300 teachers who were admitted for a medical check-up at Tokai Central Hospital between April and June 2018.

Methods

This study used data from a cross-sectional study conducted at the Tokai Central Hospital from April to June 2018. It should be noted that the Japanese school year begins in April and goes into summer break in July. The participants were public elementary and junior high school teachers who were admitted to the Tokai Central Hospital's medical check-up department. This health check-up was not mandatory for teachers but was taken by teachers who were willing to be examined at this hospital. Tokai Central Hospital belongs to the Japan Mutual Aid Association of Public School Teachers. Public school teachers can receive their health check-up at a discounted price.

The questionnaire was distributed to teachers from April to June and responses were collected by July 2018. The study excluded teachers who were currently taking leave from work not related to mental disorders and also excluded teachers who refused the invitation to complete the questionnaire. This study was approved by the Institutional Ethics Review Board at Tokai Central Hospital [Approval Number 2018010401].

Measurements

We measured sociodemographic information (age, sex, years of teaching, marital status, family members and children living at home), work-related information (number of school children, role at the school, teacher in charge of class, overwork hours per week, content of overwork, hours working during holidays, content of work during holidays and average sleep time) and reactions to occupational stress. Overwork was defined as the work over 7 h and 45 min per day. Occupational stress reactions were measured by the Brief Job Stress Questionnaire (BJSQ) (Shimomitsu *et al.*, 1999). The BJSQ consists of 57 items (four-point scales for each) and includes job stressors (17 items, e.g. psychological job demands, job control), psychological and physical stress reactions (29 items) and buffering factors, such as social support at work (11 items).

The primary outcome was the score of the psychological and physical stress reactions (29 items) on the BJSQ. Psychological and physical stress scores were converted by the raw score conversion table (main stress score) (Kato, 2000). This tool has been shown to have reliability and validity. A lower stress score indicates greater stress. The main explanatory variables related to overwork information including having overwork, working during holidays and bringing work home were identified by responses to the following three questions: "Are you overworked on working days?", "Do you have to work during holidays?" and "Do you bring work home?" These questions were recorded as dichotomous variables.

Statistical analysis

Descriptive statistics were shown as the number and percentage of participants for the categorical variables. Median and range was shown for the continuous variables. To evaluate the association among the psychological and physical stress and overwork information (overwork [Yes/No], working holidays [Yes/No] and bringing work home [Yes/No]), adjusted regression coefficients (mean difference in psychological and physical stress score), 95% confidence intervals (95% CI) and *p*-values were estimated by using

multiple regression models. Association among the stress score and overwork information was evaluated according to the type of school (elementary and junior high school). Age, sex, marital status (married/other or single), children living at home (Yes/No), school size (<100/100 - <200/200 - <300/over 300) and teacher in charge of class (Yes/No) were used for the adjustment of confounding. Unadjusted mean difference was also calculated between classes of each variables of the multiple regression model. The threshold of all statistical tests was considered to be statistically significant if the *p*-value was less than 0.05. All analyses were performed using JMP Pro (v. 14; SAS Institute, Cary, NC, USA).

Results

Of the 430 teachers, 367 signed an informed consent form (response rate = 85.3%). Administrative positions (70 teachers) were excluded and those who did not answer the BJSQ (3 teachers); thus, 294 teachers participated in this study. Of these 294 teachers, 233 were elementary school teachers (79%) and 61 were junior high school teachers (21%).

The participant and outcome characteristics were shown according to the type of school (elementary and junior high school), respectively (Table 1). The age distribution of elementary school and junior high school teachers were similar. The percentage of female teachers and teachers in charge of class was higher in elementary schools than in junior high schools (Table 1). A total of 225 teachers (97.0%) in elementary schools and 59

Table 1 Baseline characteristics and overwork information of teachers

	Elementary school (N = 233) N (%)	Junior high school (N = 61) N (%)
<i>Baseline characteristics</i>		
Age		
20–29	62(26.6)	16(26.2)
30–39	53(22.8)	16(26.2)
40–49	44(18.9)	9(14.8)
≥50	74(31.8)	20(32.8)
Sex/Gender		
Male	68(29.3)	33(54.1)
Female	164(70.7)	28(45.9)
Years of teaching		
Median (min-max)	13(1–40)	17(1–38)
Marital status		
Married or other	151(64.4)	39(66.1)
Children living at home		
Yes	105(45.1)	26(42.6)
The number of school children		
<100	96(41.4)	22(37.3)
~200	34(14.7)	8(13.6)
~300	33(14.2)	10(17.0)
~400	15(6.5)	3(5.1)
401<	54(23.3)	16(27.1)
Teacher in charge of class		
Yes	172(74.8)	35(57.4)
<i>Overwork information</i>		
Having overwork		
Yes	225(97.0)	59(96.7)
Working on holidays		
Yes	135(58.4)	50(84.8)
Bringing work to home		
Yes	120(52.0)	21(35.0)

teachers (96.7%) in junior high schools answered as having overwork. Considering work during holidays, 135 elementary school teachers (58.4%) and 50 junior high school teachers (84.8%) reported that they had worked during holidays. Finally, 120 elementary school teachers (51.95%) and 21 junior high school teachers (35.0%) reported bringing their work home.

Table 2 shows the results of the univariate and multiple regression analysis to investigate the association between psychological and physical stress scores and overwork after adjusting for sociodemographic and work-related variables. In the multiple regression model, working during holidays was significantly likely to increase psychological and physical stress reactions among elementary school teachers (adjusted mean difference = -1.67, 95% CI: -2.81 to -0.54) and junior high school teachers (adjusted mean difference = -5.24, 95% CI: -9.60 to -0.87). Bringing work home was also negatively associated with psychological and physical stress reactions among elementary school teachers (adjusted mean difference = -1.21, 95% CI: -2.33 to -0.10). A positive association, though weak, was found between psychological and physical stress and marital status (married or other vs single) ($p=0.005$) and between the stress and teacher in charge of class ($p=0.015$) among elementary school teachers.

Discussion

This study showed a possible association between working during holidays and psychological and physical stress reactions among Japanese elementary school teachers and junior high school teachers. Our findings were consistent with previous studies (Bannai *et al.*, 2015) and

Table 2 Association between the psychological and physical stress and overwork information*

	Crude mean difference of score (95% CI)	Adjusted mean difference of score (95%CI, P value)
<i>Elementary school</i>		
Having overwork [yes vs no]	-1.73 (-4.96 to 1.49)	-0.87 (-4.00 to 2.27; $p = 0.587$)
Working on holidays [yes vs no]	-2.05 (-3.16 to -0.94)	-1.67 (-2.81 to -0.54; $p = 0.004$)
Bringing work to home [yes vs no]	-1.28 (-2.39 to -0.16)	-1.21 (-2.33 to -0.10; $p = 0.034$)
Age [20-29 vs ≥ 50]	1.33 (-0.13 to 2.78)	1.77 (0.15 to 3.39; $p = 0.034$)
Age [30-39 vs ≥ 50]	1.08 (-0.49 to 2.66)	0.88 (-0.69 to 2.45; $p = 0.271$)
Age [40-49 vs ≥ 50]	-0.23 (-1.84 to 1.37)	-0.14 (-1.68 to 1.40; $p = 0.858$)
Sex [Female vs Male]	-0.73 (-1.97 to 0.51)	-0.62 (-1.81 to 0.57; $p = 0.305$)
School size [< 100 vs over 300]	1.78 (0.44 to 3.13)	1.60 (0.27 to 2.94; $p = 0.019$)
School size [100- < 200 vs over 300]	0.48 (-1.27 to 2.23)	0.06 (-1.64 to 1.76; $p = 0.944$)
School size [200- < 300 vs over 300]	0.00 (-1.77 to 1.77)	0.25 (-1.51 to 2.02; $p = 0.777$)
Teacher in charge of class [yes vs no]	1.22 (-0.08 to 2.52)	1.63 (0.33 to 2.94; $p = 0.015$)
Marital status [Married or other vs single]	0.38 (-0.79 to 1.56)	2.14 (0.67 to 3.61; $p = 0.005$)
Children living at home [Yes vs no]	-0.79 (-1.92 to 0.34)	-1.19 (-2.54 to 0.16; $p = 0.084$)
<i>Junior high school</i>		
Having overwork [yes vs no]	0.69 (-6.72 to 8.09)	3.17 (-4.77 to 11.12; $p = 0.425$)
Working on holidays [yes vs no]	-2.73 (-6.59 to 1.13)	-5.24 (-9.60 to -0.87; $p = 0.020$)
Bringing work to home [yes vs no]	-2.37 (-5.24 to 0.51)	-1.90 (-5.10 to 1.31; $p = 0.240$)
Age [20-29 vs ≥ 50]	-1.17 (-4.64 to 2.31)	-1.90 (-5.10 to 1.31; $p = 0.868$)
Age [30-39 vs ≥ 50]	0.31 (-3.22 to 3.84)	-0.61 (-4.64 to 3.41; $p = 0.760$)
Age [40-49 vs ≥ 50]	3.90 (-0.38 to 8.17)	6.00 (1.30 to 10.66; $p = 0.013$)
Sex [Female vs Male]	0.50 (-2.29 to 3.29)	-0.25 (-3.26 to 2.77; $p = 0.868$)
School size [< 100 vs over 300]	0.42 (-2.86 to 3.69)	1.72 (-1.78 to 5.21; $p = 0.328$)
School size [100- < 200 vs over 300]	0.04 (-4.54 to 4.61)	-1.92 (-7.17 to 3.34; $p = 0.466$)
School size [200- < 300 vs over 300]	2.45 (-1.74 to 6.64)	3.79 (-2.45 to 3.99; $p = 0.083$)
Teacher in charge of class [Yes vs no]	-0.25 (-3.02 to 2.51)	0.77 (-2.45 to 4.00; $p = 0.634$)
Marital status [Married or other vs single]	1.55 (-1.37 to 4.46)	3.52 (-0.71 to 7.75; $p = 0.100$)
Children living at home [Yes vs no]	0.18 (-2.59 to 2.95)	-2.72 (-6.59 to 1.15; $p = 0.163$)

Notes: *overwork information was consisted of having overwork, working on holidays and bringing work to home; other covariates were also included in the multiple regression model

added new insight that working during holidays might be a main factor in the decreased psychological and physical stress scores.

In 2013, the Organization for Economic Co-operation and Development (OECD) reported that the average working hours of public, middle school teachers was 38.3h per week internationally, but it was 53.9h in Japan (OECD, 2013) – much higher than any other countries. Additionally, Japanese teachers spend 18h “teaching” and the remainder of their time is spent performing “other duties.” Although there are nationwide efforts to reduce and resolve overwork by the Japanese Government, the 2018 Teaching and Learning International Survey by OECD still revealed that Japanese teachers in elementary and junior high schools worked longer hours than teachers in other countries (OECD, 2019). Consistently, more than 90% of teachers still answered as having overwork in elementary school and junior high school in our study. Although the intervention may not be easy, it is important to accumulate the evidence of overwork and its negative impact on mental health.

This study was a preliminary result and had several limitations. First, this study was a cross-sectional study because the data were collected only once. We need, therefore, to perform more follow-up studies to conduct a causal analysis. Second, the contents of “overwork” were not clear; thus, we were not able to reveal the most burdensome reasons for overwork among teachers. Additionally, it was unclear whether working during holidays is the choice of the teachers or mandated by the school. Third, this study was conducted in one hospital and the number of junior high school teachers analyzed was only 64; therefore, generalizability might be limited. Finally, the results may be biased by other confounding factors.

In conclusion, this study suggested an association between working during holidays and psychological and physical stress reactions among Japanese teachers after adjusting for sociodemographic and work-related status. We expect to receive questionnaire responses from over 7,000 elementary and junior high school teachers in the near future, in addition to the data from more than 1,500 teachers who have visited Tokai Central Hospital for their medical check-up. By the analysis of these larger datasets, we expect to reconfirm our prospective hypothesis that working during holidays might cause significant psychological and physical stress reactions.

Compliance with ethical standards

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study, and during this process they were notified that they could remove themselves from the study at any time during the study without any consequence to their treatment.

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