Long working hours and psychological distress among school teachers in Japan

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Abstract: Long working hours and psychological distress among school teachers in Japan: Akira Bannai, et al. Department of Public Health, Hokkaido University Graduate School of Medicine—Objectives: Long working hours have the possibility to influence human health. In Japan, it is well known that teachers have long working hours, and the number of leaves of absence due to mental disorders among public school teachers increased from 2,687 in 2002 to 4,960 in 2012. The aim of this study was to investigate the association between long working hours and psychological distress among school teachers. Methods: This cross-sectional study was conducted from mid-July to September in 2013 in Hokkaido Prefecture, Japan. Questionnaires were distributed to 1,245 teachers in public junior high schools. Information about basic characteristics, including working hours, and responses to the General Health Questionnaire-28 were collected anonymously. Multiple logistic regression analysis was used to calculate odds ratios (ORs) for the association between long working hours and psychological distress by gender. Results: Of the 1,245 teachers contacted, 558 (44.8%) responded. After excluding responses with missing data, the final sample included 522 teachers (337 males and 185 females). Psychological distress was identified in 47.8% of males and 57.8% of females. Our results showed a significantly increased risk only in males working >60 hours per week (adjusted OR=4.71 [95% CI 2.04–11.56]) compared with those working ≤40 hours per week. There were no significant associations between long working hours and psychological distress for females. Conclusions: There is a significant association between long working hours and psychological distress in male teachers. However, the causal relationship remains unclear. Further studies such as cohort studies with large sample sizes are needed.

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50.7% (n=2,687) to 59.5% (n=4,960). To the best of our knowledge, no study has investigated the association between long working hours and mental disorders among school teachers. Furthermore, the association between long working hours and psychological distress among school teachers appears to have been investigated only in a part of one previous study. However, no association was found in that study, and detailed data were not shown in the article.

We identified several previous studies about the association between long working hours and psychological distress that targeted occupational groups other than school teachers. However, the results of those studies were inconsistent. Long working hours increased the risk of psychological distress significantly among both male and female participants in three studies. However, the results for males and females were not in the same direction. For males, one study indicated no association, but two other studies revealed that long working hours significantly increased the risks of psychological distress. For females, two previous studies showed significantly increased risks of psychological distress for those working long hours, but three other studies indicated no association. Referring to past work, we were able to infer several reasons for the inconsistency in previous findings. These include the distinct definition of long working hours; differences of working hours' categories including the reference categories; the lack of data about shift work schedules, which have a detrimental influence on psychological distress; the disparity in participant characteristics such as occupation; and geographic variation in study sites. With this background, we aimed to investigate the association between long working hours and psychological distress among school teachers in this study.

Subjects and Methods

Study design and participants

We conducted a cross-sectional study in Hokkaido Prefecture, an island located in the north of Japan. The study participants were teachers working at public junior high schools in Hokkaido Prefecture except for Sapporo City. Out of the total 8,873 teachers at 534 public junior high schools in the region, we invited 1,245 teachers from 84 schools to participate in our study. In this study, we regarded teachers without any occupational position as eligible for participation. This meant that we did not include principals, vice-principals, or chief teachers in the sample. We also did not include lecturers, school nurses, or nutrition teachers because of the distinctive nature of these jobs.

Sample size was estimated at 1200 based on the following assumptions: power (1−β)=80%; two-sided test at α=0.05; effect size of odds ratio (OR)=2.0 for psychological distress, estimated with reference to a previous study; and predicted return rate=50%. Hokkaido Prefecture has 14 administrative districts, and the total sample size of 1,200 was divided according to the proportion of the total number of teachers working in each of these districts. The Hokkaido Government Board of Education randomly selected public junior high schools from all 14 districts. All teachers working in the selected schools were eligible for participation in this study, and the Board continued to select schools in each district until the number of teachers exceeded the number initially set.

The questionnaires, along with a letter explaining the purpose of the study and a stamp-addressed envelope, were distributed to all 1,245 teachers via the selected schools in mid-July 2013. Reminders about participation in the study were issued in late August by principals or vice-principals in each school through teacher conferences. Teachers agreeing to participate answered the questionnaires anonymously and posted them by themselves. Data collection was conducted until September 30, 2013. Because this survey was both voluntary and anonymous, completing the questionnaire and sending it back was regarded as providing consent to participate in this study. This study protocol was approved by the Ethics Committee of Hokkaido University Graduate School of Medicine.

Psychological distress and working hours

Psychological distress was assessed by the General Health Questionnaire-28 (GHQ-28), which was developed by Goldberg et al. This scale reflects the respondent’s mental state in the previous 2–3 weeks. We used the GHQ method to rate each question across four answers, and added the score on each item to calculate the total GHQ-28 score. The GHQ method assigns a score of 0 to the two least symptomatic answers and a score of 1 to the two most symptomatic answers. A higher total score indicates heavier psychological distress. We regarded a total score of ≥6 as a case of psychological distress.

We asked about working hours in the questionnaire using the following question: “In the month prior to the summer vacation of your students, how many hours on average in a week did you work, including work brought home?” The participants could select from four categories of working hours: ≤40, >40 and ≤50, >50 and ≤60, and >60 hours per week. The summer vacation of junior high school students in Hokkaido Prefecture typically starts in late July and lasts until mid-August. All participants in the study had 38.75 weekly contracted working hours. In this
study, we regarded long working hours as >40 hours per week. Working hours included hours of work brought home, because participants with household duties might have to return home at regular closing hours, taking their unfinished work with them.

Other data collection

We collected data related to personal background such as age (20–29, 30–39, 40–49, or ≥50), gender (male or female), and marital status (married or others). Information related to work was also collected, including type of employment (regular or temporary), classes in the school (≤3 classes, 4–6 classes, or ≥7 classes), subjects led (general, special support, or others), and work experience in the current school (<3 years or ≥3 years). Classes in the school were used to approximate the size of the school. General subjects included Japanese, social studies, mathematics, science, foreign languages, music, art, physical and health education, technical courses, and home economics. Because more than half (62.0%) of the teachers who took leaves of absence owing to mental disorders in 2012 had less than 3 years of work experience in their school, we suspected that work experience in the current school affected psychological distress. Based on previous studies about teachers, information was also gathered on the respondents’ perceptions of relationships with colleagues (very good/good or neutral/bad/very bad), job satisfaction (very satisfied/satisfied or dissatisfied/very dissatisfied), and having ≥5 hours per week of leisure time (yes or sometimes/never). In this survey, we used the Pittsburgh Sleep Quality Index (PSQ-I) to assess sleep problems (global scores of ≥5.5) for understanding their prevalence among school teachers. We also inquired about participants’ working patterns (working daytime hours on weekdays, working several hours per day on weekdays, or irregular working pattern) to exclude those working less than the contracted working time or working irregularly.

Statistical analysis

First, we showed the descriptive statistics about the basic characteristics of the participants according to working hours. Second, we calculated ORs and 95% confidence intervals (95% CI) using multiple logistic regression analysis to investigate the association between long working hours and psychological distress. We presented the results separately by gender, because the prevalence of psychological distress has been shown to differ between the genders in previous studies, and Ervasti et al. pointed out that one of the predictors for teachers’ long sick leave was female gender. Participants working ≤40 hours per week were used as the reference category. Two models were constructed. Model 1 was adjusted for personal factors (age and marital status) and work-related factors (type of employment, classes in the school, subjects led and work experience in the current school). Model 2 was additionally adjusted for variables gauging perceptions about the job (relationships with colleagues and job satisfaction) and having leisure time. The results of the PSQ-I were not used as covariates, because the GHQ-28 also included questions about sleep problems. Tests for linear trends were calculated for the associations between working hours converted into a continuous variable (0, 1, 2, 3) and psychological distress.

Two-tailed tests were used, and P-values below 0.05 were considered statistically significant. All statistical analyses were performed using JMP Pro 11 for Windows (SAS Institute Inc., Cary, NC, USA).

Results

A total of 558 (44.8%) of the distributed questionnaires were returned. We excluded responses from five school nurses and one teacher working irregularly as well as 30 participants with missing data on working hours, psychological distress, marital status, subjects led, or job satisfaction. The final analyses were performed on 522 teachers (337 males and 185 females) working daytime hours and not working on a shift schedule. The prevalence of psychological distress was 47.8% for males (n=161) and 57.8% for females (n=107). In this study, 84.6% of males and 90.8% of females worked >40 hours per week.

Table 1 shows the characteristics of male and female participants by working hours. The prevalence of psychological distress in male and female teachers, respectively, was 25.0% (n=13) and 64.7% (n=11) among those working ≤40 hours per week, 45.2% (n=19) and 54.1% (n=20) among those working >40 and ≤50 hours per week, 42.1% (n=37) and 55.0% (n=33) among those working >50 and ≤60 hours per week, and 59.4% (n=92) and 60.6% (n=43) among those working >60 hours per week.

Compared with those working ≤40 hours per week, respondents of both genders working >40 hours per week were more likely to be younger, to be in charge of general subjects or special support classes, and to have <3 years of work experience in the current school. Those working long time were less likely to be married, to perceive good relationships with colleagues, to be satisfied with their job, and to have leisure time compared with those working ≤40 hours per week. Male participants working >40 hours per week were more likely to belong to schools with ≥7 classes compared with those working ≤40 hours per week; however, female participants showed opposite results. Female participants working >40 hours
Table 1. Characteristics of the male (n=337) and female (n=185) participants by working hours

<table>
<thead>
<tr>
<th>Working hours (h/wk)</th>
<th>Male (n=337)</th>
<th>Female (n=185)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>≤40</td>
<td>&gt;40 and ≤50</td>
</tr>
<tr>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>Psychological distress(^a)</td>
<td>13 (25.0)</td>
<td>19 (45.2)</td>
</tr>
<tr>
<td>Age (years)</td>
<td>20–29</td>
<td>4 (7.7)</td>
</tr>
<tr>
<td></td>
<td>30–39</td>
<td>14 (26.9)</td>
</tr>
<tr>
<td></td>
<td>40–49</td>
<td>22 (42.3)</td>
</tr>
<tr>
<td></td>
<td>≥50</td>
<td>12 (23.1)</td>
</tr>
<tr>
<td>Marital status</td>
<td>Married</td>
<td>38 (73.1)</td>
</tr>
<tr>
<td></td>
<td>Others(^b)</td>
<td>14 (26.9)</td>
</tr>
<tr>
<td>Type of employment</td>
<td>Regular worker</td>
<td>49 (94.2)</td>
</tr>
<tr>
<td></td>
<td>Temporary worker</td>
<td>3 (5.8)</td>
</tr>
<tr>
<td>Classes in the school</td>
<td>≤3 classes</td>
<td>8 (15.4)</td>
</tr>
<tr>
<td></td>
<td>4–6 classes</td>
<td>14 (26.9)</td>
</tr>
<tr>
<td></td>
<td>≥7 classes</td>
<td>30 (57.7)</td>
</tr>
<tr>
<td>Subjects led</td>
<td>General(^c)</td>
<td>38 (73.1)</td>
</tr>
<tr>
<td></td>
<td>Special support</td>
<td>4 (7.7)</td>
</tr>
<tr>
<td></td>
<td>Others(^d)</td>
<td>10 (19.2)</td>
</tr>
<tr>
<td>Work experience in the current school</td>
<td>&lt;3 years</td>
<td>22 (42.3)</td>
</tr>
<tr>
<td></td>
<td>≥3 years</td>
<td>30 (57.7)</td>
</tr>
<tr>
<td>Relationships with colleagues</td>
<td>Very good/good</td>
<td>42 (80.8)</td>
</tr>
<tr>
<td></td>
<td>Neutral/bad/very bad</td>
<td>10 (19.2)</td>
</tr>
<tr>
<td>Job satisfaction</td>
<td>Very satisfied/satisfied</td>
<td>39 (75.0)</td>
</tr>
<tr>
<td></td>
<td>Dissatisfied/very dissatisfied</td>
<td>13 (25.0)</td>
</tr>
<tr>
<td>Having ≥5 h/wk of leisure time</td>
<td>Yes</td>
<td>26 (50.0)</td>
</tr>
<tr>
<td></td>
<td>Sometimes/never</td>
<td>26 (50.0)</td>
</tr>
<tr>
<td>Sleep problems(^e)</td>
<td>≥5.5 of PSQ-I global score</td>
<td>17 (32.7)</td>
</tr>
<tr>
<td></td>
<td>&lt;5.5 of PSQ-I global score</td>
<td>32 (61.5)</td>
</tr>
</tbody>
</table>

\(^a\)Psychological distress means total scores of the General Health Questionnaire-28 of ≥6. \(^b\)Others means unmarried, divorced, widowed, and separated. \(^c\)General subjects include Japanese, social studies, mathematics, science, foreign languages, music, art, physical and health education, technical courses, and home economics. \(^d\)Others means teachers who led multiple subjects simultaneously. \(^e\)Sleep problems refer to global scores of PSQ-I of ≥5.5. Total proportion does not add to 100% owing to the missing data.

per week were more likely to be regular workers compared with those working ≤40 hours per week. The prevalence of sleep problems was 40.4% (n=136) in males and 42.7% (n=79) in females. Male participants working >40 hours per week were more likely to have sleep problems compared with those working ≤40 hours per week, but the results were reversed for female participants.

Table 2 shows the association between long working hours and psychological distress by gender. Significant results were observed only in male participants. In the crude model for males, long working hours significantly increased the risk of psychological distress compared with working ≤40 hours per week.
After adjusting for personal and work-related factors (Model 1), significantly increased adjusted ORs (aORs) were observed for males working >50 and ≤60 hours per week (aOR=2.24 [95% CI 1.02−5.13]) and >60 hours per week (aOR=5.09 [95% CI 2.42−11.32]) compared with those working ≤40 hours per week (p for trend <0.001). The fully adjusted model (Model 2) showed significant results only for males working >60 hours per week (aOR=4.71 [95% CI 2.04−11.56]) for psychological distress compared with those working ≤40 hours per week (p for trend <0.001). The results for females showed decreased ORs and aORs for all other working hours' categories compared with those working ≤40 hours per week, but these results were not significant.

Discussion

In this study, we explored the association between long working hours and psychological distress among male and female junior high school teachers. Significant results were observed only in male participants. After adjusting for age, marital status, type of employment, classes in the school, subjects led, work experience in the current school, relationships with colleagues, job satisfaction, and having leisure time, males working >60 hours per week had a significantly increased 4.71-fold risk of psychological distress compared with those working ≤40 hours per week. In contrast, in females, working long hours showed no association with psychological distress.

In this study, the prevalence of psychological distress was higher in females (57.8%) than in males (47.8%). This tendency coincided with previous studies. The main findings from the present study of increased risks for males were partially consistent with previous studies. A previous study reported by Artazcoz et al. in 2009 indicated a significantly increased risk of psychological distress in males working 51−60 hours per week (maximum working hours' category). Takusari et al. also showed a significantly increased risk of psychological distress among long working hours. However, another study reported by Artazcoz et al. in 2007 showed no association between long working hours and psychological distress among male salaried contract workers, but the results of that study might be attributable to the lack of covariates such as shift work schedules.

We observed a gender difference in the risks of psychological distress by working hours. A previous study by Virtanen et al. also showed a significantly increased risk of psychological distress among male and female junior high school teachers. Significant results were observed only in males. After adjusting for age, marital status, type of employment, classes in the school, subjects led, work experience in the current school, relationships with colleagues, job satisfaction, and having leisure time, males working >60 hours per week had a significantly increased 4.71-fold risk of psychological distress compared with those working ≤40 hours per week. In contrast, in females, working long hours showed no association with psychological distress.

In this study, we explored the association between long working hours and psychological distress by gender (male n=337 and female n=185). Results from multiple logistic regression analysis

<table>
<thead>
<tr>
<th>Working hours (h/wk)</th>
<th>Male (n=337)</th>
<th>Female (n=185)</th>
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<tbody>
<tr>
<td></td>
<td>Crude OR (95% CI)</td>
<td>Model 1 OR (95% CI)</td>
</tr>
<tr>
<td>≤40</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>&gt;40 and ≤50</td>
<td>2.48 (1.04−6.05)</td>
<td>2.50 (1.00−6.41)</td>
</tr>
<tr>
<td>&gt;50 and ≤60</td>
<td>2.18 (1.04−4.76)</td>
<td>2.24 (1.02−5.13)</td>
</tr>
<tr>
<td>&gt;60</td>
<td>4.38 (2.21−9.15)</td>
<td>5.09 (2.42−11.32)</td>
</tr>
</tbody>
</table>

CI, confidence interval; h/wk, hours per week; OR, odds ratio. *Adjusted for age (20−29, 30−39, 40−49, ≥50), marital status (married, others), type of employment (regular, temporary), classes in the school (≤3, 4−6, ≥7), subjects led (general, special support education, others) and work experience in the current school (<3 years, ≥3 years). †Model 1 additionally adjusted for relationships with colleagues (very good/good or neutral/bad/very bad), job satisfaction (very satisfied/satisfied or dissatisfied/very dissatisfied), and having ≥5 h/wk of leisure time (yes or sometimes/never). ‡Case means total scores of General Health Questionnaire-28 of ≥6. The test for trend was calculated across increasing categories of working hours per week.
might also explain the gender difference in our results. The first was that females often had an extra burden due to extended hours of work and domestic chores. The second was that working long hours was less normative for females and might be more stressful, for example, in terms of work–family conflict. Females may be more influenced by domestic life than males, especially in Japan, where husbands spend less time on housework than husbands in Western countries. This might relate to the high prevalence of psychological distress among females despite the difference in working hours. Therefore, it might be difficult to discover the disparity of risks of psychological distress by working hours among females in this study.

We compared the prevalence of psychological distress in our study with findings on other occupational groups in Japan to explore potential explanations for our results. Urakawa et al. revealed that, among factory workers, 27.1% of males and 30.4% of females had psychological distress. Takusari et al. observed psychological distress in 31.4% of male workers and 33.5% of female workers in medium-sized business establishments including construction, information and communication, manufacturing, combined services, retail trade, and medical welfare. Hayasaka et al. investigated the work environment among female doctors, reporting a prevalence of 41.6% for psychological distress. Nagai et al. showed that 46.4% of civil servants had psychological distress.

Our study showed that the prevalence of psychological distress among school teachers was 47.8% in males and 57.8% in females (total prevalence=51.3%). These numbers were higher than the results for other professions but lower than those for school teachers in a previous study (62.9%, including both genders). Furthermore, a higher prevalence (68.8%) has been reported among female hospital nurses. Based on these results, school teachers showed a relatively high prevalence of psychological distress compared with other kinds of workers in Japan. Hospital nurses also had a high prevalence of psychological distress. These are both human service industry occupations, and have a common background that has been well researched in terms of burnout syndrome in Japan since the 1980s. These characteristics might be related to the high prevalence of psychological distress.

As mentioned in the introduction, only one previous study reported the association between long working hours and psychological distress among school teachers. However, the result was not significant and detailed data were not shown in the article. Therefore, our study is considered the first to focus on the association between long working hours and psychological distress among school teachers. Our results revealed that school teachers of both genders worked long hours, and about 40% or more worked >60 hours per week. We also confirmed an increased risk of psychological distress among male school teachers working >60 hours per week.

A plausible explanation for the association between long working hours and psychological distress is that long working hours may influence workers’ mental health by reducing the amount of private time available to them. Jansen et al. found that workers with long working time need more time to recover from work-induced fatigue. However, they do not have enough time to rest, and are unable to recover. Our study showed that 50.0% of males and 47.1% of females working ≤40 hours per week did not have leisure time. This proportion increased to 61.4% for males and 59.5% for females among those working >40 hours per week. These results indicated the insufficiency of rest among participants.

Moreover, reduced private time may lead to a decrease in sleeping time and may also affect sleep quality. This study showed that the prevalence of sleep problems, as measured by the PSQ-I, was 40.4% in males and 42.7% in females. These prevalence were higher than those for other occupational groups in Japan: 21.2% in males and 31.4% in females among civil servants in 2003 and 35.8% among male white-collar workers in 2004. Sleep problems such as sleep onset insomnia, sleep maintenance insomnia, and subjective sleep insufficiency are associated with depression or anxiety. Therefore, lack of rest including sleep problems might affect the mental health of individuals working long hours.

Another plausible explanation for this association is that individuals working long hours might develop psychologically unhealthy states through occupational stress as suggested by the demand-control model and the effort-reward imbalance model. In previous studies, long working hours has been associated with these two models through variables such as high strain and effort-reward imbalance. These two occupational stress models are considered to be associated with major depressive disorder.

There are several strengths in our study. First, this study is considered the first to document the association between long working hours and psychological distress measured by the GHQ among school teachers. Second, this study defined long working hours as >40 hours per week, confined the participants to non-shift workers, and defined the reference group as those working ≤40 hours per week. We believe that this approach to the research contributed to the investigation of the association between long working
hours and health, because the clear definition of long working hours, the exclusion of detrimental effects to human health by shift work, and the selection of this reference group allow for a clear interpretation of the results.

Though there have been several previous studies related to our study, the working hours’ categories were different in these studies, so it is not straightforward to compare the results of these studies. Moreover, because the information on shift work was almost unknown in prior studies, the interpretation of the reported results is difficult. This means that the studies without information on shift work do not exclude the increased risk for psychological distress caused by the shift work itself, as indicated by a prior study. Because our reference group did not include participants working less than the contracted working time, we believe our analysis was properly conducted. A third strength of the present study is our use of the GHQ to evaluate psychological distress. This questionnaire has been confirmed in terms of its validity and reliability and has been used throughout the world. Fourth, because this study was conducted in mid-2013, the results obtained are relatively new and reflect recent patterns in working hours.

Our study has some limitations. First, this study is a cross-sectional study, so we could not directly infer the causal relationship between long working hours and psychological distress. Second, we collected data on working hours from self-reported questionnaires. Self-reported working hours might lead to recall bias, and this might have affected our results. Third, our study might include participants who had medical histories of mental disorders. Because individuals with mental disorders are suspected to have a higher risk of psychological distress, our results may have been influenced to some extent. Fourth, the participants in our study may not be representative of school teachers because of the relatively low response rate (44.8%). Though our results may be difficult to generalize, our study is valuable as a first step toward elucidating the association between long working hours and psychological distress among school teachers.

In this cross-sectional study, we investigated the association between long working hours and psychological distress among school teachers in Japan. Our results indicated that males working >60 hours per week had a significantly increased risk for psychological distress compared with those working ≤40 hours per week. However, the causal relationship between long working hours and psychological distress remains unclear because of our study design. Additional studies including cohort studies with large sample sizes are needed.

Acknowledgments: We appreciate the cooperation of all of the participants, the public junior high schools in Hokkaido, and the Hokkaido Government Board of Education. This study was supported by grants from the Health Care Science Institute in Japan. All authors declare that they have no conflicts of interest.

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