

ORIGINAL

Gender differences of the influential factors on the mental health condition of teachers in the A university

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Abstract : The purpose of this research was to investigate the gender differences of the influential factors on the mental health condition among university teachers in the A university in Japan. A questionnaire survey was mailed to 924 university teachers in Japan, with a survey return rate of 43.8% (N=405). The General Health Questionnaire 28 (GHQ-28), Multidimensional Scale of Perceived Social Support (MSPSS), the Japanese version of the Brief Coping Orientation to Problems Experienced (COPE) and the Work Situation Questionnaire (WSQ) developed by the authors were administered to subjects. The GHQ-28 total score and all of sub-score of the woman was significantly higher than men. In the correlated factor of mental health, level of job satisfaction and job control, social support of significant others was observed in the both sexes. However, gender differences was observed in the coping style. Some copings including self-distraction and self-blame were related to the men, but the woman was related to the substance use. University teachers had some gender differences in the factors affecting their mental health condition. In order to improve university teacher's mental health condition, it is necessary to increase their level of job satisfaction and feeling of job control in the workplace. Especially, it was considered women's coping using substance use was important. *J. Med. Invest.* 62 : 56-61, February, 2015

Keywords : mental health condition, gender differences, university teachers

INTRODUCTION

According to a report released in 2013 by Japan's Ministry of Education, Culture, Sports, Science and Technology (1), the Japanese economic environment has dramatically changed. The job workloads and standards demand has increased, the need for socialization of diverse student population has increased, and the poor mental health condition of workers in the workplace is becoming an important social issue. In addition, there is a decline in personal coping behaviors and changes in personal relations. As a result, early identification and treatment of depression is changing. Educational activities related to depression are more prevalent and early-stage medical treatment for depression is accelerating.

The educational field is experiencing similar patterns. According to a 2011 Ministry of Education, Culture, Sports, Science, and Technology (2) survey, there are 5,407 teachers at public elementary and middle schools who have taken a leave from their job due to mental problems. In addition, mental health problems accounted for 62.4% of sick leave. As a result, mental health measures are a pressing issue in the enrichment of school education. However, there is no mental health measures specific for university teachers even though stress factors are prevalent in the university setting.

Teaching and research performance in the University are directly related to a teachers' promotion. The occupational stress arising from issues of tenure and research fund acquisition have received attention (3-5). Therefore, these issues are suspected of contributing factors to a university teachers' mental burden.

In addition to the traditional teaching and research roles at

research institutions, there are further challenges related to changes in work content such as regional contribution, globalization, and diversification of entrance exam systems. Beginning in 2007, student diversity changed ; in that if one wasn't particular about a university or department anyone could get accepted, and universities had become a place where more diverse young people gathered than in the past (6). The mental health condition of university teachers who participate in the socialization of diverse students is an important issue, but there is little research in this area (7-8).

Another factor to consider when examining the mental health issues of university teachers is the change in the law related to gender. In 1999, Japan enacted the *Basic Act for Gender-Equality Society*, which requires gender specific diagnosis and treatment for various ailments and conditions. In the past, treatment was based on men standards, but with the change in the law, gender specific diagnosis and treatment have received much attention.

The purpose of this research was to investigate the gender differences of the influential factors on the mental health condition among university teachers in Japan.

METHODS

Subjects

The subjects were 924 university teachers in Japan, working for the same university. This university has about 1,900 staff members, five faculties, six graduate schools, and some institutes and hospital. Subjects work for the arts and sciences, engineering, medicine, dentistry, and pharmaceutical. Surveys were returned by 405 subjects yielding a response rate of 43.8%. Due to incomplete returns, data from 337 surveys were analyzed.

Survey methods

The self-administered questionnaire survey was mailed, returned

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and analyzed from November 2010 to January 2011.

Instruments

The following instruments were used for data collection.

- 1) Individual parameters surveyed were gender, age, professional position, and length of teaching experience.
- 2) The Work Situation Questionnaires (WSQ) developed by authors, was consisted of five questions : working hours, hours of homework per week, conditions of taking paid leave, job satisfaction and job control level.
- 3) Mental health conditions were evaluated using a modified version of the Japanese General Health Questionnaire (GHQ-28) (9-10). Scores range from 0 to 28 with a score 6 or over considered poor mental well-being.
- 4) Social support perceived by the teachers was assessed using the Japanese version of the Multidimensional Scale of Perceived Social Support (MSPSS) (11-14). Total and sub-scores range from 1 to 7, with higher scores suggesting greater levels of perceived social support.
- 5) The coping style of teachers was assessed using the Japanese version of the Brief Coping Orientation to Problems Experienced (COPE) (15-17). Sub-scores range from 1 to 8, with higher scores suggesting greater levels of used coping skills.

Data analysis

- 1) The variables of individual parameters, work situation (Work Situation Questionnaire), mental health (GHQ-28 total and 4 sub-scores), social support (MSPSS total and 3 sub-scores), and coping styles (14 sub-scores of Brief COPE) were calculated and an analysis using the chi-square test, and t-test were conducted. Differences between "Professional position" and "gender", were analyzed using the chi-square test, supplemented by residual analysis, and two-way analysis of variance.
- 2) With GHQ total score and sub-scores as standard variables, and individual parameters, work situation, social support, and coping styles as explanatory variables, multiple regression analysis via the stepwise method was conducted. Data were analyzed using IBM SPSS Statistics Version 20.0 for Windows. A p-value of less than 0.05 was considered significant.

Ethical considerations

This research was approved by the Ethics Committees of the University of Tokushima Hospital (approval number 1032). No harm could be identified to the subjects and the return of the survey implied consent by the subjects. Subjects were notified that privacy would be protected, as only aggregate data would be utilized in reporting of findings.

RESULTS

Demographic Data

The subjects included 270 men (80.1%) and 67 women (19.9%). There were significant differences in age ($p=0.001$), professional position ($p<0.001$), and length of teaching experience ($p<0.001$).

The number of professors (adjusted residual of 3.9, $p<0.01$) and associate professors (adjusted residual of 2.0, $p<0.05$) were significantly higher for men than women, but the assistant professor (adjusted residual of 5.9, $p<0.01$) was significantly higher for women than man. Findings yielded no significant interaction between the two variables of professional position and gender by the two-way analysis of variance.

The gender differences in the each variable

Gender differences were found in the following items ; the conditions of taking paid leave, level of job satisfaction and job control,

the mental health condition and coping style. Men scored significantly higher with the conditions of taking paid leave ($p=0.002$), level of job satisfaction and job control ($p=0.001$, $p=0.037$).

Women scored significantly higher in all items : GHQ-28 total score ($p<0.001$), and GHQ-28 sub-scores : somatic symptoms ($p<0.001$), anxiety and insomnia ($p=0.004$), social dysfunction ($p=0.011$), and severe depression ($p=0.048$).

In the coping style, women scored significantly higher : self-distraction ($p<0.001$) ; use of emotional support ($p<0.001$), use of instrumental support ($p<0.001$), behavioral disengagement ($p<0.001$), venting ($p<0.001$), and self-blame ($p=0.003$) (See, Table1).

Gender Difference Individual Parameters, Work Situation, Social support, and Coping Styles with GHQ as standard variable

The stepwise multiple-regression analysis revealed GHQ was significantly associated with numerous variables. In the men's GHQ total score ($R^2=0.313$, $p<0.001$), somatic symptoms ($R^2=0.175$, $p<0.001$), anxiety and insomnia sub-score ($R^2=0.221$, $p<0.001$), social dysfunction sub-scores ($R^2=0.359$, $p<0.001$), severe depression ($R^2=0.169$, $p<0.001$) : In the women's GHQ total score ($R^2=0.421$, $p<0.001$), somatic symptoms ($R^2=0.199$, $p<0.001$), anxiety and insomnia sub-score ($R^2=0.533$, $p<0.001$), social dysfunction sub-scores ($R^2=0.422$, $p<0.001$), severe depression ($R^2=0.286$, $p<0.001$). In the men's GHQ-28 sub-scores : anxiety and insomnia, significant standard partial regression coefficients were level of job control ($\beta=-0.231$), self-blame of the Cope ($\beta=0.271$).

Also, in men's GHQ-28 sub-scores : social dysfunction, significant standard partial regression coefficients were job satisfaction level ($\beta=-0.440$), self-blame of the Cope ($\beta=0.176$), and MSPSS sub-scales : significant other subscale ($\beta=-0.418$) and in the men's GHQ total score, it was job satisfaction level ($\beta=-0.319$), the sub-scores of COPE : self-distraction ($\beta=0.161$), and self-blame ($\beta=0.257$).

In the women's GHQ-28 sub-scores : anxiety and insomnia, significant standard partial regression coefficients were level of job control ($\beta=-0.459$), homework ($\beta=0.293$), MSPSS subscales : friends subscales ($\beta=-0.404$), the sub-scores of COPE : substance use ($\beta=0.326$), self-distraction ($\beta=0.212$), religion ($\beta=0.211$), and teaching experiences ($\beta=-0.209$). Also, in women's GHQ-28 sub-scores : social dysfunction, it was job satisfaction level ($\beta=-0.472$), substance use of the COPE, working hours per week ($\beta=-0.250$), and MSPSS sub-scales : significant other subscale ($\beta=-0.214$) and in the women's GHQ total score, it was substance use of the COPE ($\beta=0.457$), job satisfaction level ($\beta=-0.342$), and MSPSS subscales : significant others subscale ($\beta=-0.259$) (See table 2).

DISCUSSION

Since the two way analysis of variance yielded no significant interaction between the two variables of professional position and gender by the by the two-way analysis of variance. Therefore, we consider only sex difference, regardless of professional position.

Mental health conditions as measured by the GHQ-28 total score revealed that the women university teaching staff of Japan could be called a "somewhat unhealthy group". Men scored 6.21 (SD=5.59) and women scored 9.10 (SD=5.61) with a cut-off point of 6 points (10, 18). In addition, findings revealed that the GHQ-28 subscale scores for women on somatic symptoms, anxiety and insomnia, social dysfunction, and severe depression were significantly higher than the men's score.

In several studies on academic stress, findings revealed that women have higher stress levels than men (7, 19, 20). Some studies (5, 10, 21-22) have not identified any significant gender differences. However, in this study, some survey items related with GHQ-28 in the both sex.

Table 1. The gender differences in the each variables (N=337)

Variables	Total N=337 (100.0%)	Men N=270 (80.1%)	Women N=67 (19.9%)	p-value ^{a)}	p-value ^{b)}
	Mean ± SD / n (%)	Adjusted residual Mean ± SD / n (%)	Adjusted residual Mean ± SD / n (%)		
Individual Parameters					
Age (yrs)	44.0 ± 9.7	44.9 ± 9.6	40.4 ± 9.3	0.001	0.308
Professional position					
Professor	101(30.0)	94(34.8) <u>3.9</u>	7(10.4) -3.9	< 0.001	< 0.01
Associate professor	52(15.4)	47(17.4) <u>2.0</u>	5(7.5) -2.0	< 0.05	
Lecturer	53(15.7)	45(16.7) 1.0	8(11.9) -1.0		
Assistant professor	131(38.9)	84(31.3) -5.9	47(70.1) <u>5.9</u>	< 0.01	
Teaching experiences (yrs)	15.6 ± 10.2	16.7 ± 10.2	11.1 ± 8.9	< 0.001	0.611
Work Situation (WSQ)					
Working hours per week	60.8 ± 16.6	61.6 ± 16.2	57.4 ± 18.0	0.065	0.255
Homework Yes	230(68.2)	181(67.0)	49(73.1)	0.337	
No	107(31.8)	89(33.0)	18(26.9)		
Conditions of taking paid leave					
Always	48(14.2)	46(17.0) <u>2.9</u>	2(3.0) -2.9	0.002	< 0.01
Often	136(40.4)	99(36.7) -2.8	37(55.2) <u>2.8</u>	< 0.01	
Seldom	153(45.4)	125(46.3) 0.7	28(41.8) -0.7		
Job satisfaction level (%)	63.1 ± 17.9	64.7 ± 16.9	56.5 ± 20.3	0.001	0.450
Job control level (%)	60.3 ± 19.8	61.5 ± 19.3	55.8 ± 21.4	0.037	0.302
Mental Health (GHQ-28)					
Total score	6.78 ± 5.70	6.21 ± 5.59	9.10 ± 5.61	< 0.001	0.501
Somatic symptoms	2.62 ± 2.23	2.39 ± 2.22	3.55 ± 2.04	< 0.001	0.675
Anxiety and insomnia	2.36 ± 2.01	2.20 ± 2.04	3.00 ± 1.74	0.004	0.789
Social dysfunction	1.21 ± 1.60	1.10 ± 1.50	1.66 ± 1.92	0.011	0.057
Severe depression	0.59 ± 1.42	0.51 ± 1.38	0.90 ± 1.56	0.048	0.690
Social Support (MSPSS)					
Total score	5.26 ± 1.05	5.24 ± 1.02	5.36 ± 1.15	0.396	0.911
Family subscale	5.61 ± 1.18	5.59 ± 1.14	5.71 ± 1.32	0.460	0.974
Significant other subscale	5.34 ± 1.20	5.33 ± 1.17	5.41 ± 1.31	0.594	0.978
Friends subscale	4.82 ± 1.20	4.79 ± 1.17	4.95 ± 1.29	0.331	0.603
Coping styles (COPE)					
Self-distraction	4.66 ± 1.29	4.50 ± 1.26	5.30 ± 1.21	< 0.001	0.955
Active coping	5.68 ± 1.02	5.67 ± 1.04	5.72 ± 0.92	0.761	0.597
Denial	2.60 ± 0.88	2.60 ± 0.91	2.61 ± 0.76	0.896	0.708
Substance use	3.48 ± 1.65	3.54 ± 1.64	3.24 ± 1.64	0.174	0.747
Use of emotional support	4.61 ± 1.36	4.37 ± 1.26	5.60 ± 1.32	< 0.001	0.604
Use of instrumental support	4.89 ± 1.31	4.73 ± 1.28	5.54 ± 1.26	< 0.001	0.713
Behavioral disengagement	3.59 ± 1.02	3.49 ± 1.05	4.01 ± 0.77	< 0.001	0.237
Venting	4.40 ± 1.20	4.19 ± 1.13	5.25 ± 1.11	< 0.001	0.581
Positive reframing	5.24 ± 1.18	5.21 ± 1.21	5.39 ± 1.04	0.264	0.553
Planning	6.12 ± 1.03	6.15 ± 1.05	6.01 ± 0.95	0.345	0.396
Humor	4.02 ± 1.32	3.99 ± 1.29	4.15 ± 1.47	0.376	0.526
Acceptance	6.05 ± 0.93	6.02 ± 0.97	6.16 ± 0.77	0.254	0.644
Religion	3.00 ± 1.13	2.94 ± 1.09	3.22 ± 1.27	0.066	0.287
Self-blame	4.28 ± 1.28	4.18 ± 1.21	4.70 ± 1.49	0.003	0.642

Abbreviations : Work Situation Questionnaires (WSQ), General Health Questionnaire (GHQ-28), Multidimensional Scale of Perceived Social Support (MSPSS), brief Coping Orientation to Problems Experienced (COPE), and Standard deviation (SD).

a) Two tailed Student's t test was used for continuous variables, and Pearson chi-square test was used for categorical variables.

b) Interaction between two variables of professional position and gender by the two-way analysis of variance.

Table 2. Multiple regression analyses of predictors of the General Health Questionnaire

GHQ-28	Total score β (p-value)		Somatic symptoms β (p-value)		Anxiety and insomnia β (p-value)		Social dysfunction β (p-value)		Severe depression β (p-value)	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Individual Parameters										
Age (yrs)										
Professional position										
Professor			Standard							
Associate professor			0.144(0.023)							
Lecturer			0.108(0.084)							
Assistant professor			-0.028(0.665)							
Teaching experiences (yrs)							-0.209(0.032)			
Work Situation (WSQ)										
Working hours per week								-0.250(0.015)		
Homework							0.293(0.003)			
Conditions of taking paid leave ^{a)}	0.118(0.025)		0.135(0.022)		0.134(0.018)					
Job satisfaction level (%)	-0.319(<0.001)	-0.342(0.001)					-0.440(<0.001)	-0.472(<0.001)	-0.196(0.001)	
Job control level (%)			-0.223(<0.001)		-0.269(0.021)	-0.231(<0.001)	-0.459(<0.001)			
Social Support (MSPSS)										
Total Score										
Family							0.223(0.015)			-0.191(0.001)
Significant others	-0.174(0.001)	-0.259(0.010)					-0.418(<0.001)	-0.214(0.032)	-0.432(<0.001)	
Friends							-0.404(<0.001)			
Coping styles (COPE)										
Self-distraction	0.161(0.002)		0.178(0.002)				0.212(0.017)	0.132(0.010)		
Active coping										
Denial										
Substance use		0.457(<0.001)		0.331(0.005)	0.153(0.006)	0.326(<0.001)		0.408(<0.001)	0.338(0.002)	
Use of emotional support										
Use of instrumental support										
Behavioral disengagement										
Venting										
Positive reframing										
Planning			0.170(0.003)							
Humor										
Acceptance									0.266(0.015)	
Religion						0.211(0.024)				
Self-blame	0.257(<0.001)		0.126(0.034)		0.271(<0.001)		0.176(0.001)		0.259(<0.001)	
multiple correlation coefficient	0.571	0.669	0.447	0.473	0.482	0.775	0.609	0.676	0.422	0.564
coefficient of determination R ²	0.313	0.421	0.175	0.199	0.221	0.553	0.359	0.422	0.169	0.286
F value (p-value)	25.520(<0.001)	17.012(<0.001)	8.154(<0.001)	9.216(<0.001)	20.068(<0.001)	12.659(<0.001)	31.176(<0.001)	13.070(<0.001)	19.257(<0.001)	9.805(<0.001)

β : standardized partial regression coefficient

a) Conditions of taking paid leave : (1)Always,(2)Often,(3)Seldom

The findings of this research study supports earlier research related to the relationship between work conditions and mental health (23). The fact that the level of job satisfaction influences mental health has been made clear by studies on nursing university teachers (24-25) and other occupations (26-29).

Similar to the findings of this research study, previous research related to level of demand from work and job control measured by the Job Demand-Control Model (30-31) have revealed the relationship between social support (32), level of job satisfaction and coping style. Yasumi *et al.* reported that in order to reduce psychological stress responses and increase job satisfaction, improving the level of job control is more effective than improving the level of job burden (33). Other studies have shown that the lack of control has an impact on work (34-35). Other findings (14) have revealed a difference in gender and age. Therefore, in order to improve the mental health of teachers, interventions to increase a

sense of control over their jobs would be beneficial.

Regarding social support in this research study, the support of significant other was associated with GHQ-28 total score, GHQ-28 sub score ; social dysfunction in the both sexes. In the women university teachers, the support of significant other was significant rerated with GHQ-28 sub score ; severe depression. In this way, much social support including association between GHQ-28 sub score ; anxiety and insomnia, and “the support of the friend” of the woman university teachers.

Furthermore, gender differences (36, 37) was observed in the coping style. Some copings including self-distraction and self-blame were related to the men, but the woman was related to the substance use. In the men’s coping style have showed higher issue-priority coping which deals with problems calmly and assertively (38), women have higher coping with changes of mood, emotional expression, and which seeks resolutions from others (39). Also, it

was conjectured that social support was utilized as a coping resource (40).

In general, assertive coping is related to mental and physical health (41), and a relation was also seen between emotion-priority coping and a decline in mental health (42). However, there are many workplace stressors which cannot be solved by the efforts of individual workers. Coping is least effective in areas of life, such as in a work setting, that are impersonally organized and in which the forces affecting people are beyond the kinds of personal coping controls that this research study examines (43). In this research study, the primary factors influencing the mental health conditions of university teachers of both sexes were, level of job satisfaction and job control, social support of significant others. However, gender differences was observed in the male/female coping style. Some copings styles, including self-distraction and self-blame, were related to the men, but woman related to the substance use.

The GHQ total score was related to level of job satisfaction, significant others, and coping with substance use. Therefore, the coping style scale indicated that the women subjects in this research study use substance use to cope, thus possibly impacting their mental health condition. In order to improve the mental health condition of women, it is necessary to increase their level of job satisfaction and feeling of job control in their work place. Also, it is so important to reduce the use of the substance use as a coping style. Learning a healthy copying style, such as cognitive-behavioral intervention should be considered in future interventions as well as future research related to coping styles and specific substance use.

LIMITATIONS

Generalization of the results is limited since only 1 university was studied. In the future, research that targets a greater number of universities teaching staff is needed.

CONCLUSION

As gender-specific medical treatment is receiving attention, this research study focused on the primary factors influencing the mental health of Japan's A university teachers by gender. Mental health conditions as measured by the GHQ-28 total score revealed that the women university teachers were found to be "somewhat unhealthy group". The primary factors influencing the mental health of university teachers were level of job satisfaction and job control, social support, and coping style. In order to improve the mental health condition, it is necessary to increase their level of job satisfaction and feeling of job control in the workplace.

The GHQ-28 total score and all of sub-score of the woman was significantly higher than men. In the correlated factor of mental health, level of job satisfaction and job control, social support of significant others was observed in the both sexes. However, gender differences was observed in the coping style. Some copings including self-distraction and self-blame were related to the men, but the woman was related to the substance use. University teachers had some gender differences in the factors affecting their mental health condition. In order to improve university teacher's mental health condition, it is necessary to increase their level of job satisfaction and feeling of job control in the workplace. Especially, it was considered women's coping using substance use was important. Cognitive behavioral interventions have been found to be useful in treating stress and anxiety.

CONFLICT OF INTEREST

None of the authors have any conflicts of interest associated with this research study.

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REFERENCES

1. Ministry of Education, Culture, Sports, Science and Technology, 2013. For mental health of teachers : final report. (http://www.mext.go.jp/component/b_menu/shingi/toushin/_icsFiles/afieldfile/2013/03/29/1332655_03.pdf) (in Japanese)
2. Ministry of Education, Culture, Sports, Science and Technology, 2011. For mental health of teachers : midterm summary. (http://www.mext.go.jp/b_menu/shingi/chousa/shotou/088/shiryo/_icsFiles/afieldfile/2013/02/26/1330868_08.pdf) (in Japanese)
3. Sun W, Wu H, Wang L : Occupational stress and its related factors among university teachers in china. *Journal of Occupational Health* 53 : 280-286, 2011
4. Ahsan N, Abdullah Z, Fie D.Y.G, Alam S.S : A study of job stress on job satisfaction among university staff in Malaysia : Empirical Study. *European Journal of Social Sciences* 8 : 121-131, 2009
5. Winefield AH, Jarrett R : Occupational stress in university staff. *International Journal Stress Management* 8 : 285-298, 2001
6. Ministry of Economy, Trade and Industry, 2007, Fundamental competencies for working persons. <http://www.meti.go.jp/policy/kisoryoku/chukanhon.pdf> (in Japanese)
7. Nishimura Y, Iwasa Y, Tanaka Y, Fujii K, Takayama M : Mental health survey of university staff in 2008. *The Bulletin of Keio University Health Center* 28 : 27-32, 2010 (in Japanese)
8. Kataoka M, Ozawa K, Ichie K, Iwamitsu Y : The relationship between burnout, individual parameters, teaching aptitude and job satisfaction among research associates in college of nursing. *Journal of Japan Society of Nursing Research* 31 : 67-74, 2008 (in Japanese)
9. Goldberg DP, Hillier VF : A scaled version of the General Health Questionnaire. *Psychological Medicine* 9 : 139-145, 1979
10. Nakagawa Y, Daibo I : The General Health Questionnaire by Goldberg, D, *Nihon Bunka Kagakusya*, 1985 (in Japanese)
11. Dahlem N, Zimet GD, Walker R : The multidimensional scale of perceived social support : a confirmation study. *Journal of Clinical Psychology* 47 : 756-761, 1991
12. Zimet GD, Powell SS, Farley GK, Werkman S, Berkoff K : Psychometric characteristics of the multidimensional scale of perceived social support. *Journal of Personality Assessment* 55 : 610-617, 1990
13. Zimet GD, Dahlem NW, Zimet SG, Farley GK : The multidimensional scale of perceived social support. *Journal of Personality Assessment* 52 : 30-41, 1988
14. H. Iwasa, Y. Gondo, Y. Masui, H. Inagaki, C. Kawai, R. Otsuka, M. Ogawa, M. Takayama, H. Imuta, T. Suzuki : Reliability and validity of "Social Support Scale". Japanese language edition : Investigation targeting middle and old age. *Indicators of social welfare* 54 : 26-33, 2007. (in Japanese)
15. Carver CS : You want to measure coping but your protocol's

- too long : consider the brief COPE. *International Journal of Behavioral Medicine* 4 : 92-100, 1997
16. Otsuka Y : The COPE Inventory : a theoretically based coping questionnaire. *Hiroshima Psychological research* 8 : 121-128, 2008 (in Japanese)
 17. Otsuka Y, Sasaki T, Iwasaki K, Mori I : Working hours, coping skills, and psychological health in Japanese daytime workers. *Industrial Health* 47 : 22-32, 2009
 18. Fukunishi I : The assessment of cut-off point of the General Health Questionnaire (GHQ) in the Japanese. *Clinical Psychology* 3 (3) : 228-234, 1990 (in Japanese)
 19. Blix G, Cruise RJ, Mitchell BM, Blix GG : Occupational stress among university teachers. *Educational Research* 36 : 157-169, 1994
 20. Boyd S, Wylie C : Workload and stress in New Zealand Universities. *New Zealand Council for Educational Research and The Association of University Staff of New Zealand*. 114, 1994
 21. Ofoegbu F, Nwandiani M. : Level of perceived stress among lecturers in Nigerian Universities. *Journal of instructional psychology* 33 (1), 66-74, 2006
 22. Abouserie R : Stress, coping strategies and job satisfaction in university academic staff. *Educational Psychology* 16 : 49-56, 1996
 23. Fujino Y, Horie S, Hoshuyama T, Tsutsui T, Tanaka Y : A systematic review of working hours and mental health burden. *Journal of occupational health* 48 : 87-97, 2006 (in Japanese)
 24. Kataoka M, Ozawa K, Ichie K, Kumasaka T, Iwamitsu I : Relationship among mental Health, coping, and job satisfaction in research associates at nursing college. *Japanese Bulletin of Social Psychiatry* 18 : 74-83, 2009 (in Japanese)
 25. Kataoka M, Iwamitsu Y, Kawakami Y, Matsuzaka Y, Okawa M, Takigawa K : The relationship among mental health, work situation, and work satisfaction for research associates at college of nursing. *Journal of Nursing, Shiga University of Medical Science* 2 : 35-45, 2003 (in Japanese)
 26. Tokuda Y, Hayano K, Ozaki M, Bito S, Yanai H, Koizumi S : The Interrelationships between working conditions, job satisfaction, burnout and mental health among hospital physicians in Japan : a Path Analysis. *Industrial Health* 47 (2) : 166-172, 2009
 27. Miura Y, Suzuki N, Takeuchi K, Takezawa T, Yamamoto M, Yaguchi K : Causal relationship between Job Satisfaction, job dissatisfaction and mental health state in office workers. *Tokai University, School of Health Sciences bulletin* 7 : 59-66, 2001 (in Japanese)
 28. Tsukamoto N : Stress coping and adaptation in nurses. *Bulletin of Tokyo Metropolitan College of Allied Medical Sciences* 11 : 83-89, 1998 (in Japanese)
 29. Oribe H : A psychiatric survey of private company employees. *Journal of Nara Medical Association* 46 : 487-499, 1995 (in Japanese)
 30. Karasek R : Job demands, job decision latitude, and mental strain : implications for job redesign. *Administrative Science Quarterly* 24 : 285-307, 1979
 31. Karasek, R, Theorell : *Healthy work*. Basic Books, New York, 1990
 32. Johnson JV, Hall EM : Job strain, work place social support, and cardiovascular disease : A cross-sectional study of a random sample of the Swedish working population. *American Journal Public Health* 78 : 1336-1342, 1988
 33. Yasumi K, Kageyama J, Saito K, Michimata N, Kato M : Survey targeting teaching staff and students regarding stress-From data of the 4 year period since the national universities were incorporated. *Campus Health* 46 : 100-105, 2009 (in Japanese).
 34. Kinman G : Pressure points : a review of research on stressors all strains in UK academics. *Educational Psychology* 21 : 473-492, 2001
 35. Tytherleigh MY, Webb C, Cooper CL, Ricketts C : Occupational stress in UK higher education institutions : a comparative study of all staff categories. *Higher Education Research & Development* 24 : 41-61, 2001
 36. Korabik K, Kampen VJ : Gender, social support, and coping with work stressors among managers. *Journal of Social Behavior and Personality* 10 : 135-148, 1995
 37. Kito A, Hori M, Otsuka Y : The relationship among stressors, coping strategies, and stress reactions in junior and senior high school teachers : comparison of vigor and negative stress reactions. *Job Stress Research* 15 : 213-222, 2008 (in Japanese)
 38. Kato C : Difference in coping behaviors between young men and women. *Bulletin of Hiroshima Prefectural College of Health and Welfare* 4 (1) : 13-16, 1999 (in Japanese)
 39. Tomotsune Y, Sasahara S, Umeda T, Hayashi M, Usami K, Yoshino S, Kageyama T, Nakamura H, Matsuzaki I : The association of sense of coherence and coping profile with stress among research park city workers in Japan. *Industrial Health* 47 : 664-672, 2009
 40. Harada K, Moriyama M, Kobayashi T : The relationships among nursing teachers' stress, social support, and burnout. *Journal of Japan Academy of Nursing Education* 22 : 25-34, 2012 (in Japanese)
 41. Lazarus RS : From psychological stress to the emotions : a history of changing outlooks. *Annual Review of Psychology* 44 : 1-21, 1993
 42. Kitazoe N, Inoue S : Mental health among inexperienced teachers-Relation to the job related stress and the coping behavior. *Japanese Bulletin of Social Psychiatry* 18 : 178-185, 2009 (in Japanese).
 43. Perlin LI, Schooler C : The structure of coping. *Journal of Health and Social Behavior* 19 : 2-21, 1978