Framework for Psychosocial Risk Management (PRIMA-EF)プロジェクト(2007-2008)によるガイドラインがあり、この内容は英国規格協会 PAS 1010 における心理社会的リスク（職業性ストレス）のマネジメント・プロセスとして採用されている。一方、わが国で 2006 年３月に厚生労働省労働基準局安全衛生部労働衛生課から公表されている「労働者の心の健康の保持・増進のための指針」では、心の健康づくり計画の実施状況の評価及び計画の見直しを行うこととしている。本研究では、PRIMA-EF にもとづく職場の心理社会的リスク要因を改善の進め方と「労働者の心の健康の保持・増進のための指針」による事業場の対策の進め方という２つの方法を比較し、その相互関係について検討した。

PRIMA-EF プロジェクトにおける職場の心理社会的リスク要因の改善の進め方について資料を参考として整理した。また「労働者の心の健康の保持・増進のための指針」の考え方に基づき心の健康づくり計画をＰＤＣＡサイクルで展開する手順について、「労働安全衛生マネジメントシステムに関する指針」(2006 年 3 月改正)に合わせて整理した。

PRIMA-EF では、企業の日常の生産活動の中で職場の心理社会的リスク要因を改善することを計画的に実施すること、また実施状況を心理社会的リスク要因、対策活動、結果指標の３側面から評価することが提案されている。PRIMA-EF で提案されているステップは、①リスクアセスメントおよび既存の活動の監査、②計画の策定、③リスクの軽減（計画の実施）、④結果の評価、⑤組織学習というＰＤＣＡサイクルで実施されている。しかし単に職場の心理社会的要因のリスク軽減のみならず、より広い範囲の対策を含むことも許容されていることがわかった。一方、指針における心の健康づくり計画をＰＤＣＡサイクルで展開する手順は「労働安全衛生マネジメントシステムに関する指針」と整合性がとれていた。

これらの２つのアプローチには多くの共通点があり、PRIMA モデルを職場の心理社会的要因の改善よりもより広い視点の対策も取り入れてゆくこと、指針に基づく活動をより PDCA に基づく活動となるよう普及・推進してゆくことが重要と考えられる。

Ｆ．健康危機情報

該当せず。

Ｇ．研究発表

１．論文発表

該当せず。

２．学会発表

該当せず。

Ｈ．知的財産権の出願・登録状況

1.特許取得

該当せず。

2.実用新案登録

該当せず。

3.その他

該当せず。

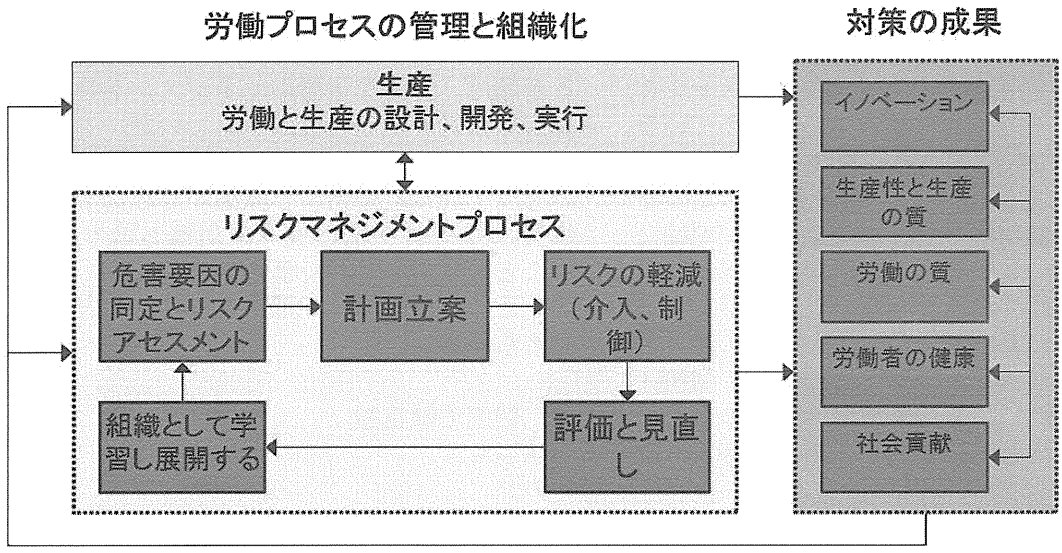

図１　European Framework for Psychosocial Risk Management (PRIMA-EF)プロジェクト(2007-2008)に基づいた英国規格協会 PAS 1010 における心理社会的リスクのマネジメント・プロセス.
用語は、わかりやすく意訳したもので、正式な翻訳ではない。

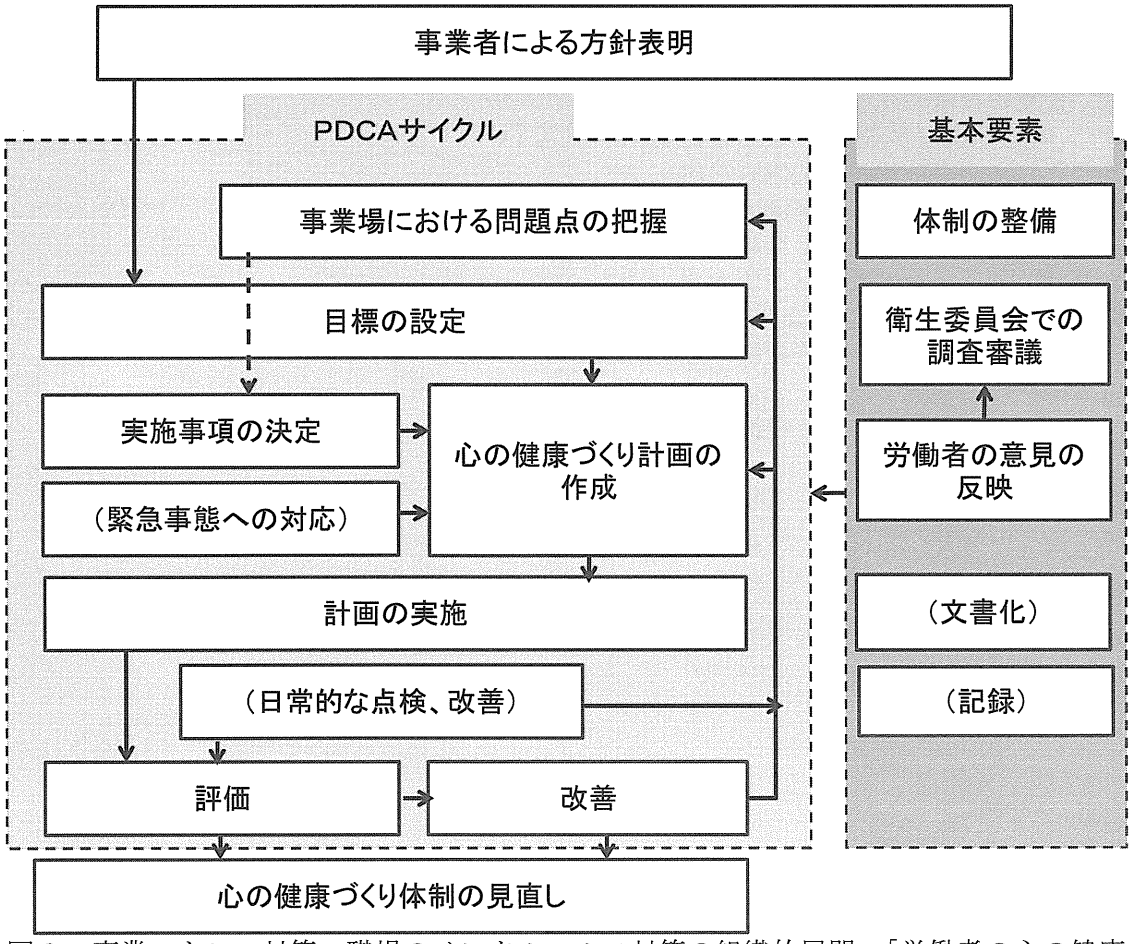

図２　産業ストレス対策・職場のメンタルヘルス対策の組織的展開：「労働者の心の健康の保持・増進のための指針」における心の健康づくり計画を、労働安全衛生マネジメントシステムによる計画(Plan)－実施 (Do) －評価 (Check) －改善 (Act) (PDCA)サイクルに合わせて書き直したもの. 括弧内は労働安全衛生マネジメントシステム指針にはあるが、心の健康づくり計画には記載がない.

Ⅲ. 研究成果の刊行に関する一覧表

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IV. 研究成果の刊行物・別刷

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Title:

Development of a Short Questionnaire to Measure an Extended Set of Job Demands, Job Resources, and Positive Health Outcomes: the New Brief Job Stress Questionnaire

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Abstract

This study aimed to investigate the reliability and construct validity of a new version of the Brief Job Stress Questionnaire (New BJSQ), which measures an extended set of psychosocial factors at work by adding new scales/items to the current version of the BJSQ. Additional scales/items were extensively collected from theoretical job stress models and similar questionnaires in several countries. Scales/items were field-tested and refined through a pilot internet survey. Finally, an 84-item questionnaire (141 items in total when combined with the current BJSQ) was developed. A nationally representative survey was administered to employees in Japan (n=1,633) to examine the reliability and construct validity. Most scales showed acceptable levels of internal consistency and test-retest reliability. Principal component analyses showed that the first factor explained 50% or greater proportion of the variance in most scales. A scale factor analysis and a correlation analysis showed that these scales fit the theoretical expectations. These findings provided a piece of evidence that the New BJSQ scales are reliable and valid. Although more detailed content and construct validity should be examined in future study, the New BJSQ is a useful instrument to evaluate psychosocial work environment and positive mental health outcomes in the current workplace.

Key words: job stress, primary prevention, psychosocial risk management, reliability, stress assessment, validity

Introduction

In Japan, the number of workers with mental health problems is increasing[1] and thus primary prevention of mental health problems is a high priority for both employers and employees. Previous studies have shown that "assessing and improving work environment" effectively reduces mental health problems[2, 3]; thus, the Brief Job Stress Questionnaire (BJSQ)[4] and Job Stress Assessment Diagram (JSAD)[5] have been developed with an aim to assess and improve work environment in Japan. The BJSQ and JSAD have been widely used in research and practice in the field of mental health in the workplace in Japan[6, 7].

However, more than 10 years have passed since the development of these tools and since then, the field of prevention of job stress and workplace mental health has developed rapidly. First, in addition to the traditional job demands-control model[8], the effort-reward imbalance (ERI) model has been proposed[9] and found to be associated with various health problems, such as poor mental health and cardiovascular diseases (CVD)[10–13]. Second, recent research in this field has focused on higher-level organizational factors, such as organizational justice (i.e., the extent to which employees perceive workplace decision-making procedures and interactions to be fair)[14] and workplace social capital (i.e., shared values, attitudes, and norms of trust and reciprocity as well as practices of collective action in their work unit)[15]. These organizational factors were also found to be associated with poor mental health and CVD[12, 16–18]. Third, advancing research on work-family interference has indicated that both negative and positive spillovers from work life to non-work life are important factors in worker mental health[19–21]. Fourth, with the introduction of the positive psychology to this field, positive attitude at work, such as work engagement[22], has received an increased attention as an alternative mental health and well-being outcome among workers. Finally, workplace bullying or harassment at work has become a prominent problem in occupational health[23, 24]. However, these newly-proposed factors and outcomes cannot be measured by the current BJSQ; thus, they should be measured with a short questionnaire that would easily

assess psychosocial workplace environments as well as their employees (i.e., health-related) and organizational (i.e., business-related) outcomes in the practice.

Such multidimensional and comprehensive assessment of these traditional and newly-proposed psychosocial factors and outcomes complies with psychosocial risk management framework in European countries, such as Psychosocial Risk Management-European Framework (PRIMA-EF)[25] and the UK Health and Safety Executive's (HSE) Management Standards for work related stress[26]. PRIMA-EF is a part of the World Health Organization's Healthy Workplaces Framework[27] which proposes the healthy workplace model: a comprehensive way of thinking and acting that addresses work-related physical and psychosocial risks; promotion and support of healthy behaviors; and broader social and environmental determinants. On the other hand, the UK HSE Management Standards cover six primary sources of stress at work, such as demands, control, support (managerial support and peer support), relationship (conflict and unacceptable behavior), role (role ambiguity and role conflict), and change (preparedness to organizational changes),which are associated with poor health and well-being, lower productivity, and increased sickness absence.

Therefore, the purpose of the present study was to develop a new version of the Brief Job Stress Questionnaire (New BJSQ), which can assess job demands and job resources as well as employee and organizational outcomes multidimensionally and comprehensively by adding its scales/items to the current version of the BJSQ.

Methods

Development of an item pool

1) Review of the current BJSQ scales

First, we reviewed the current BJSQ scales to assess what scales should be newly added. The BJSQ is a 57-item questionnaire developed in Japan[4]. The items of the scales are

measured on a four-point Likert-type response option and assess a wide range of psychosocial work environments, stress reactions, and buffering factors based on the job stress model proposed by the group of researchers from the US National Institute for Occupational Safety and Health (NIOSH)[28]. Regarding job stressors, the instrument measures quantitative job overload (three items), qualitative job overload (three items), physical demands (one item), job control (three items), skill (under)utilization (one item), interpersonal conflict (three items), poor physical environment (one item), suitable jobs (one item), and intrinsic rewards (one item). For buffering factors, supervisor support (three items) and coworker support (three items) as well as support from family and friends (three items) are measured. An 18-item scale measures five aspects of psychological distress or mood: vigor (three items), anger-irritability (three items), fatigue (three items), anxiety (three items), and depression (six items). Another 11-item scale is prepared to measure physical complaints or physical stress reactions. The BJSQ also measures job satisfaction and life satisfaction (one item for each). All of these scales have been proven to show acceptable or high levels of internal consistency reliability and factor-based validity[4]. We concluded that the current BJSQ measured basic elements of task-level psychosocial work environment based on the job demands-control and demand-control-support models[8, 29] as well as psychological and physical health outcomes while it did not measure workgroup- or organizational-level factors or positive mental health outcomes.

2) Collection of scales and items based on recent theories on job stress

We collected scales and items related to "job demands (i.e., physical, social, or organizational job aspects that require sustained physical and/or psychological effort and are associated with certain physiological and/or psychological costs)", "job resources (i.e., physical, psychological, social, or organizational job aspects that may be functional in achieving work-related goals; reduce job demands and the associated physiological and

psychological costs; and stimulate personal growth and development)", or "outcomes" and evaluated suitability of these for the New BJSQ based on three sources: recent theories of job stress, already-established questionnaires of job stress, and a series of meetings with stakeholders. We first reviewed the relevant literature to find recent theories on job stress and their measures that were developed in the last 10 years but not used in the current BJSQ. This work indentified several theories, including ERI model[9], emotional demands[30], bullying and mobbing[23, 24], organizational justice (procedural justice and interactional justice)[31–33], and workplace social capital[15] as job demands and resources; and work engagement[22] as a potential outcome. Although a large part of these scales and items have been reported their reliability and validity, our original items were partly included in the item pool. The established scales for these constructs were also reviewed and their items were included in the item pool of the New BJSQ. Each "job resources" scale was classified into three levels, i.e., "task-level", "workgroup-level", and "organizational-level" in order to indicate targets of a relevant intervention. Some proposed scales were combined because of their conceptual overlap (e.g., role ambiguity and role clarity).

3) Collection of scales and items from previous questionnaires

We also reviewed questionnaires and/or published guidance of job stress and related variables, which were used in practice. These included PRIMA-EF[25], which provided a list of wide range of psychosocial work environments that could be related to worker mental health. The UK HSE Management Standards for work related stress[26] developed a questionnaire to measure six aspects of work environment mentioned earlier: demands, control, support, relationship, role, and change. The second version of the Copenhagen Psychosocial Questionnaire (COPSOQ II)[34] was designed to measure a wide range of psychosocial factors, but the instrument was particularly unique in that it measures emotional demands, predictability, possibilities for development, quality of leadership, social community

at work and trust (as a part of workplace social capital), justice and respect, and family-work (im)balance. The Korean Occupational Stress Scale (KOSS)[35], developed in an Asian country, was also used as a reference. It measures eight dimensions of psychosocial work environment: physical environment, job demand, insufficient job control, interpersonal conflict, job insecurity, organizational system, lack of reward, and occupational climate. We compared the scales included in these questionnaires to cover all these concepts in the New BJSQ.

4) Proposal of additional scales from stakeholder meetings

We held a series of stakeholder meetings, which were held twice a year attended by researchers from five institutes/departments of occupational safety and health, occupational health staffs (physicians, nurses, and hygienists), and representatives of two employer associations and one employee association. Based on group discussions in the meetings, several new concepts of job resources were proposed. (1) "Workplace where people compliment each other" measures a workplace in which workers are appropriately appreciated and comprises items that may overlap with items of reward at work to some extent even though the reward scale did not specifically intend to measure this aspect of work. (2) "Workplace where mistakes are acceptable" assesses a workplace in which workers have a chance to recover even if they failed or made a mistake at work. (3) "Diversity" concerns worker diversity, particularly in terms of psychological differences by gender, age, and employment status. These aspects of organizational characteristics were added to the scale/item pool to create the New BJSQ.

Candidate scales/items for the pilot study

Through the process described above, we developed the trial version of the New BJSQ comprising 34 scales (129 items). These were "quantitative job overload", "emotional

demands", "role conflict", "work-self balance (negative)", and "workplace harassment" classified as "job demands" (five scales, 14 items); "meaningfulness of work", "job control", "role clarity", "career opportunity", "novelty", and "predictability" classified as "task-level job resources" (six scales, 19 items); "monetary/status reward", "esteem reward", "job security", "leadership", "interactional justice", "workplace where people compliment each other", "workplace where mistakes are acceptable", "collective efficacy (i.e., team members' belief that they can successfully organize and execute the courses of action required to accomplish given goals)[36]", and "workplace social capital" classified as "workgroup-level job resources" (nine scales, 38 items); "trust with management", "preparedness for change", "procedural justice", "respect for individuals", "fair personnel evaluation", "diversity", "career development", and "work-self balance (positive)" classified as "organizational-level job resources" (eight scales, 33 items); and "work engagement", "performance of a duty", "realization of creativity", "active learning", "work performance", and "others" classified as "outcomes" (six scales, 25 items).

A pilot internet survey

On March 17, 2010, Japanese employees aged 15 years or older who registered with Yahoo! Research monitors were invited to complete an anonymous web-based self-administered questionnaire including the current BJSQ and a trial version of the New BJSQ. On the same day, the number of respondents reached 1,000 (687 men and 313 women) and the survey was terminated. Based on the data from these 1,000 respondents, we further reduced the number of items and developed a final "standard" version of the New BJSQ. We calculated Cronbach's alpha coefficient and item-total correlation coefficients (ITCs) for each candidate scale, and if possible, limited the number of items to two or three, five at maximum, in reference to opinion of occupational health staffs (e.g., occupational physicians, occupational health nurses, and clinical psychologists). Finally, the final

"standard" version of the New BJSQ comprised 30 scales and 84 items (49 scales and 141 items in total when combined with the current 57-item BJSQ) (see Table 1). All New BJSQ scales are available at http://www.jstress.net (only in Japanese language).

Insert Table 1

Reliability, validity, and normative scores of the New BJSQ

1) Participants

To test reliability and validity and obtain normative scores of the New BJSQ, we conducted cross-sectional and one-year prospective studies of a nationally representative sample of workers in Japan. In November 2010, a self-administered questionnaire was mailed to 5,000 Japanese people aged 20–60 years selected by a two-stage random sampling. More specifically, we firstly selected 100 municipalities randomly by considering the population size and then selected 50 residents randomly from each municipality using the population registry. If the selected municipality did not allow us to access population registry, we randomly selected another municipality. By February 2011, we received 2,400 completed questionnaires, of which 2,384 were valid (response rate, 47.7%). Among the respondents, 1,633 respondents (847 men and 786 women) were classified as being employed. Out of these 1,633 employed respondents, 479 agreed to participate in a follow-up survey. In November 2011, the same questionnaires were sent to these participants and 417 questionnaires (202 men and 215 women) were returned by December 2011 (response rate, 87.1%). Detailed characteristics of participants are shown in Table 2. The Ethics Committee of the Graduate School of Medicine/Faculty of Medicine, The University of Tokyo reviewed and approved aims, designs, and procedures of the internet-based pilot study, the cross-sectional and prospective studies, as well as the aforementioned pilot internet survey (No. 2953).

Insert Table 2

2) Measures

The self-administered questionnaires at baseline and follow-up included all scales of the current BJSQ and New BJSQ.

3) Statistical analysis

Based on the baseline cross-sectional data (1,633 employees), a national average and standard deviation of each scale of the current BJSQ and New BJSQ were calculated for the total sample. Unlike calculating a scale score as a sum of the item scores, in this analysis, a scale score was calculated as an average item score (i.e., a sum of the item scores divided by the number of items) ranging from 1 to 4 for all the scales of current BJSQ and New BJSQ after converting all item scores so that higher scores indicated better status (e.g., a higher score of job demands means lower job demands and a higher score of psychological stress reaction means low level of psychological distress; on the other hand, a higher score of job resources means higher job resources; for novelty, the score was transformed that the higher score means greater frequency of encountering new things at work). This procedure allowed us to standardize averages and ranges of scores across scales and to interpret scale scores easier, making the comparison of the scale scores more convenient.

Cronbach's alpha coefficient for each scale was calculated to evaluate internal consistency reliability. A proportion of variance explained by the first factor was calculated for scales with more than one item to examine their factor-based validity. Furthermore, based on the data from 417 respondents who completed the one-year follow-up, Pearson's correlation coefficients were calculated to evaluate one-year test-retest reliability. For these analyses, a pair-wise deletion of cases rather than list-wise deletion was used when items had a missing response.

Using 1,442 respondents who completed all the 34 psychosocial work environment scales (excluding "support from family and friends" scale because of non-work environment), exploratory and confirmatory factor analyses were conducted for 34 scales to see whether the

factor structure fit the job demands-resources (JD-R) model[37], in which psychosocial work environment can be classified into job demands and task-, workgroup-, and organizational-level job resources. For exploratory factor analysis, the principal factor method with Oblimin rotation was used to extract the number of factors based on the scree test criterion. The scree test involves plotting the eigenvalues in descending order of their magnitude against their factor numbers and determining where they level off. The break between steep slope and leveling off indicates the number of meaningful factors. For confirmatory factor analysis, model fit was assessed using fit indices including the goodness of fit index (GFI), adjusted goodness of fit index (AGFI), comparative fit index (CFI), and root mean square error of approximation (RMSEA) estimated by the maximum likelihood method. To examine whether the data fit the JD-R model[37], in which job demands predict negative emotional reactions (such as burnout) while job resources, including task-level, workgroup-level, and organizational-level, predict both negative and positive emotional reactions (such as work engagement), polychoric correlation coefficients were calculated between 35 scales (including "support from family and friends" scale) of psychosocial work environment and selected outcomes (psychological and physical stress reactions, work engagement, workplace social capital, and workplace harassment) using 1,398 respondents who completed all scales.

All the analyses were conducted using the IBM SPSS Statistics and Amos version 19.

Results

National average of the New BJSQ scores

For a nationally representative sample of 1,633 employees, average scores for most scales of the current BJSQ and New BJSQ fell between 2.0 and 3.0, with an average of 2.6 (Table 3). The average score was higher for workplace harassment (3.58), depression (3.27), and physical stress reactions (3.22) and lower for work-self balance (positive), respect for

individuals, quantitative job overload, and fair personnel evaluation (2.10–2.15). More detailed information about the national average scores by gender, occupation, employment type, and industry is available at http://www.jstress.net (only in Japanese language).

Insert Table 3

Reliability of the New BJSQ

Almost all scales showed high internal consistency reliability (Cronbach's alpha>0.70) (Table 4). The Cronbach's alpha coefficients were moderate for interpersonal conflict, role clarity, predictability, job security, and diversity (0.60–0.69). Furthermore, among 417 workers who completed one-year follow-up, one-year test-retest reliability as measured by Pearson's correlation coefficient was high (0.50 or greater) for most scales while it was slightly lower for skill utilization, role clarity, predictability, workplace harassment, and performance of a duty.

Factor-based validity of the New BJSQ

For most scales, the variance explained by the first factor in the principal component analysis exceeded 50% (Table 4). The variance explained was lower (30–50%) for psychological stress reaction and physical stress reaction scales of the current BJSQ.

Insert Table 4

Scale factor analysis

Figure 1 shows the scree plot for the exploratory factor analysis of 34 scales of the current BJSQ and New BJSQ, which measure psychosocial work environment. According to the scree test criterion, three-factor structure was thought to be meaningful because the break between the steep slope and leveling off was between factor number three and four.

Insert Figure 1

When we assumed the three-factor structure, most organizational-level job resources scales showed high loadings on Factor 1 (>0.70) (Table 5). Most scales from workgroup-level job

resources also showed moderate factor loadings (>0.50) on this factor. Factor 1 could be interpreted as workgroup- and organizational-level job resources. Most job demands scales showed higher factor loading on Factor 2, possibly representing a job demands dimension. Three out of eight scales of task-level job resources showed high loadings on Factor 3. Skill utilization and role clarity did not load on any factor (<0.50) while highest factor loadings were shown in Factor 3. Therefore, Factor 3 could be interpreted as task-level job resources. The inter-factor correlation between Factor 1 and 2 was 0.20; between Factor 1 and 3 was 0.56; and between Factor 2 and 3 was 0.09, respectively.

Insert Table 5

In the confirmatory factor analysis, assuming that there were four factors (i.e., job demands and task-, workgroup-, and organizational-level job resources), fit indices were 0.79, 0.76, 0.78, and 0.08 for GFI, AGFI, CFI, and RMSEA, respectively. Factor loading for each scale was all significant (p<0.001) (Table 6). When we conducted the same analysis assuming that there were three factors, based on the result of the exploratory factor analysis, these indices were 0.77, 0.74, 0.75, and 0.09, respectively. An additional analysis to compare the four-factor structure and the three-factor structure based on the result of the exploratory factor analysis indicated that the expected cross-validation index (ECVI) was 3.94 for the former model and 4.41 for the latter model, showing the former model had better fit.

Insert Table 6

Correlation with outcomes

Polychoric correlation coefficients between psychosocial work environment and outcomes were calculated using the data from 1,398 respondents who completed all scales (Table 7). In general, job demands scales correlated strongly with psychological and physical stress reactions but modestly with work engagement and workplace social capital. Job resources scales correlated with psychological and physical stress reactions to a similar extent. However, these scales, particularly workgroup- and organizational-level job resources,