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Development of the Occupational Stress Scale for Small and Medium-sized Enterprise Owners for Stress Prevention Measures

Original Article

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Abstract

Small and medium-sized enterprise (SME) owners are at an increased risk of mental disorders in addition to stress directly related to their business performance. However, steps to protect SME owners' mental health are lacking, and no occupational stress scale has been developed to accurately understand the real-world situation. Based on a nationwide internet survey of 1,000 Japanese SME owners aged 20–79 years with five or more employees, we developed a novel occupational stress scale for SME owners. The 43-item scale assesses job stress factors and modifying factors (individual, non-work, and buffering factors). The validity and reliability of the scale were verified. The job stress factors were unique among SME owners and differed from those of employees, with moderate positive correlations with both psychological distress and presenteeism. Further, the study revealed the roles of modifying factors; work-family conflict increased presenteeism and psychological distress, while self-care and social support decreased them. The findings provide important insights for assessing psychological stress among SME owners, informing future mental health intervention strategies among this population.

Keywords: Small and medium-sized enterprise (SME) owners, occupational stress, scale development, presenteeism, COSMIN

Introduction

Japan has 3,578,000 small and medium-sized enterprise (SME) owners¹⁾. In 2021, there were 1,298 suicides among these owners; health and economic problems accounted for approximately 70% of the causes of suicide²⁾. Cocker *et al.* reported that high occupational stress is strongly associated with absenteeism or presenteeism among SME owners³⁾. A high proportion of SME owners (71.3%) believe that their mental health influences business performance⁴⁾. Additionally, SME owners are at an increased risk of mental disorders, which could result in poor business performance⁵⁾. Therefore, SME owners are under high job stress, which has a direct impact on their management.

Considering SME owners' mental health status, its impact on business performance, and the absence of countermeasures, steps should be established to protect SME owners' mental health. However, unlike company employees, who are protected by a full range of mental health measures, such measures for SME owners are inadequate and fall under their self-responsibility. In addition, despite the large number of mental health intervention studies for employees, there are only a few intervention studies for owners^{6, 7)}.

Furthermore, the findings are inconsistent owing to the use of small sample sizes and different evaluation scales. A Japanese mental health survey of SME owners reported that 77% experienced mental stress⁴⁾, much higher than that in a similar study of employees (58.6%)⁸⁾. Moreover, a Swedish study reported that SME owners are under high psychological strain and are in a constant state of tension. Contrarily, a German study reported that SME owners have lower rates of mental illness than their employees⁹⁾, and a U.S. study reported higher levels of health and optimism among SME owners¹⁰⁾.

In Japan, the Stress Check Program under the Occupational Health and Safety Law requires owners to conduct self-administered questionnaires for employees that measure job stressors, modifying factors, stress responses, and other additional items once a year.

However, the stress check for SME owners has not been institutionalized, and there is no legal mental health support for owners. One study on SME owners that utilized the Brief Occupational Stress Questionnaire (BJSQ)¹¹⁾ reported low job stress factor scores despite high psychological distress scores¹²⁾. These findings suggest that the BJSQ does not adequately capture stress in SME owners. Hence, while the scale is appropriate for workers, it cannot measure occupational stress among SME owners¹³⁾.

Reported stressors of SME owners include economic problems, social isolation, long working hours, poor work/life balance³⁾, chronic overwork and a lack of job security, poor communication¹⁴⁾, and work-family conflict (WFC)¹⁵⁾. In addition, behavioral characteristics that increase stress levels, such as being unable to express one's vulnerability⁴⁾, managerial image, being invulnerable, and not asking for help¹⁶⁻¹⁸⁾, have also been reported. Thus, although the job stress factors of SME owners overlap with those of workers, many factors are different. Thus, a comprehensive scale is required to assess the occupational stress experienced by SME owners.

Therefore, SME owners are under high job stress, which has a direct impact on their management. To devise effective countermeasures, it is necessary to understand the actual state of job stress among SME owners. However, studies on occupational stress among SME owners are limited, and research results are inconsistent owing to different evaluation scales and lack of comprehensive scales. Therefore, this study aims to develop a novel job stress questionnaire for SME owners and verify its validity and reliability. Additionally, we identify the job stress and modifying factors that affect the psychological stress responses among SME owners, to consider effective mental healthcare measures that match the job stress characteristics of SME owners.

Subjects and Methods

Scale Development Procedure

The process of scale development is shown in Fig. 1. In Step 1, a systematic review of previous studies on stressors among SME owners was conducted. The results demonstrated that some work-related stress factors of SME owners overlapped with those of employees (e.g., overwork and WFC) and some factors differed from those of employees (e.g., lack of funds and human resources). We hypothesized that there would be associations between job stress and the psychological stress responses of SME owners (Occupational Stress Model for SME owners: OSMS) based on the NIOSH (National Institute for Occupational Safety and Health) job stress model¹⁹⁾ that can be applied to common occupations (Fig. 2).

The NIOSH model is a comprehensive framework that demonstrates how work-related stressors affect health. This model presents a sequence of acute stress responses (e.g., depression, somatic complaints, and sickness absenteeism) under the influence of job stress factors (e.g., workload, job control, and cognitive demand), which consequently lead to stress-related illnesses, reduced work efficiency, and other problems. Modifying factors influence this process, including individual (e.g., age, personality), non-work (e.g., WFC), and buffering factors (e.g., social support). This model was used to provide a primarily preventive approach to stress, as it identifies both job stress factors and modifying factors.

In Step 2, in accordance with the hypotheses, 11 interview items were developed by reviewing the job stressors and modifying the factors of SME owners from previous studies. The semi-structured interviews were conducted face-to-face with 19 SME owners.

In Step 3, verbatim transcripts of the interviews were prepared. Based on OSMS, codes were created and classified by factor. In total, 147 codes (10 categories and 31 subcategories)²⁰⁾ were obtained. In Step 4, based on the classification codes, we classified and integrated job stressors (29 items) and modification factors (48 items) to create a 66-item provisional questionnaire. In Step 5, an Internet survey was conducted using the newly

developed questionnaire to evaluate questionnaire validity and reliability. As a result, job stressors (16 items) and modification factors (27 items) were used to create a 43-item questionnaire according to our hypothesis.

Four researchers performed these procedures: an industrial physician who was a former SME owner, a clinical psychologist who was an occupational stress researcher, a licensed psychologist with a master's degree in business administration, and a management scientist who researched SME owners' health. The wording of the survey questions was revised for comprehensibility with further input from three active SME owners.

[Figs. 1 and 2 near here]

Participants and Study Time

The target population was 6,908 SME owners aged 20–79 years with five or more employees (but no more than 300 employees). Participants were selected from among 2,212,088 survey panel members of a Japanese Internet research firm. Eligible respondents completed the survey until the number of respondents reached 1,000. Following the research summary description, the outline of the study and the protection of privacy were explained to participants online. We established a system in which only those who agreed to participate could respond. The survey period was from December 12 to 15, 2020 (four days). The relevant Ethics Committee (19-15-12) approved the study.

Measures

The questionnaire consisted of a total of 66 items: 29 work stressor items and 37 modifying factor items (personal factors, non-work factors, and buffer factors). Further, we included 11 items of psychological stress response (psychological distress, presenteeism) and five items regarding demographic characteristics (age, type of industry, working hours,

number of days off per week, and status as owner) for a total of 82 items. Participants were asked about their state of mind over the past 30 days.

1 Job Stress Factors

Job stress factors are psychological and social stressors that result from a job. The survey on industrial safety and health (actual condition survey) conducted annually in Japan reports that 80% of the stress factors among employees are the quantity and quality of work and human relations problems in the workplace²¹). We developed original questions regarding the job stress factors for SME owners based on the information obtained through the interviews. The questions concerned financial management (FM), human resource management (HRM), and workload. The questionnaire consisted of 29 items, and responses were rated on a 4-point Likert scale (where 4 = agree and 1 = disagree). Higher scores indicated stronger job stress factors (Appendix 1).

2 Modifying Factors

2.1 Individual Factors

The individual factors were five items asking about sex, years of experience as an owner, company size (Less than 10, 11–20, 21–50, 51–100, 101–300 employees), educational attainment (high school, college or higher professional school, or university or higher), and marital status. Additionally, we examined participants' self-efficacy. The results of interviews with SME owners displayed that many of them made confident statements regarding self-efficacy, such as "I am close to the image of my ideal company"¹²). Bandura (1977) suggested that mastery experience has the greatest impact on self-efficacy²²). Furthermore, it has been reported that individuals with high self-efficacy are able to bounce back more quickly and maintain their commitment to their goals when setbacks occur²³). However, as no self-efficacy scale for SME owners has been created, we

developed a self-efficacy questionnaire by extracting statements on mastery experience from the interviews. This questionnaire consisted of 14 items, and responses were rated on a 4-point Likert scale (where 4 = agree and 1 = disagree). Higher scores indicated higher self-efficacy.

2.2 *Non-work Factors*

2.2.1 *Work-Family Conflict*

Work-Family Conflict (WFC) is a role conflict that occurs when individuals experience multiple, incompatible demands between work and family roles. Judge *et al.* reported WFC as a stressor for SME owners¹⁵⁾, and similar factors were identified through our interviews¹²⁾. Questionnaire items were based on the Japanese version of the Survey Work-Home Interaction—Nijmegen (SWING-J) presented by Shimada *et al.*²⁴⁾. Four items with high factor loadings were used from the 22 items of the SWING-J. Additionally, wording from the interviews were employed. Responses were rated on a 4-point Likert scale (4 = agree and 1 = disagree). Higher scores indicated higher WFC.

2.2.2 *Family or Co-owner Illness*

A previous interview study on SME owners found that the illness or death of a family member or partner was strongly related to job stress for SME owners²⁰⁾. In Holmes and Rahe's study, the death or illness of a family member or close friend was reported as an important stressor²⁵⁾; in particular, the illness of the co-owner affected the business²⁰⁾. We used the wording extracted from the interviews to prepare the two original questions, and responses were rated on a 4-point Likert scale (where 4 = agree and 1 = disagree). Higher scores indicated more concern about family or co-owner illness.

2.3 Buffering Factors

2.3.1 Self-care

Self-care, including health management, is important in Japan, where 58.4% of SME owners are over 60 years old. Self-care questionnaires in previous studies were directed toward specific occupations, such as nurses, or toward patients with chronic diseases; there was no self-care questionnaire for healthy owners. Therefore, based on the results of the interview survey²⁰⁾, questionnaire items on self-care preventing stress were developed for SME owners. We used the wording extracted from the interviews to prepare the six original questions. Responses were rated on a 4-point Likert scale (4 = agree and 1 = disagree). Higher scores indicated higher engagement in self-care.

2.3.2 Social Support

Social support is emotional or material support that comes from interpersonal relationships in society. Support from supervisors or co-workers is important for workers. We identified 11 types of supporters for SME owners: close owners, professionals (e.g., tax accountants and lawyers), co-owners (co-managers), family members, friends, financial institutions, investors, trusted customers, business supporters (e.g., business coaches/consultants), mental health supporters (e.g., counselors), and personal life supporters (e.g., helpers with childcare, housework, and nursing care) using our interview survey²⁰⁾.

However, among the 11 types of supporters, there were some that many owners relied on and some that only a few relied on. Conversely, there are four main types of social support supporters in the questionnaire for employees (supervisors, co-workers, family, and friends). To simplify the questionnaire for SME owners, we narrowed down the supporter types. We asked the question, “Can you count on the following supporters?” for each support type, utilizing a four-point scale with options ranging from “4 = dependable” to “1 = not

dependable,” with an additional choice of “0 = not necessary (less necessary as a supporter).” We decided to exclude supporter types with low percentages of respondents who rated them as “4 = dependable” or “3 = fairly dependable” and high percentages of respondents who rated them as “0 = not necessary.”

3 Psychological Stress Responses

3.1 Psychological Distress

Psychological distress was measured using the Japanese version of the K6, a short screening scale for psychological distress developed by Kessler *et al.*²⁶⁾. The K6 scale has six items on the frequency of experiencing symptoms of psychological distress (e.g., feeling so sad that nothing can help you). Participants responded to the statements on a 5-point Likert scale (where 4 = all the time and 0 = none of the time). Total scores ranged from 0 to 24, with higher scores indicating greater psychological distress. The Japanese version of the K6 scale was developed following the World Health Organization’s translation guidelines by experts in psychiatric interviewing and/or psychiatric epidemiology^{27, 28)}. Its reliability and validity have been evaluated by community surveys in Japan. The K6 is strongly correlated with occupational stress^{29, 30)} and mental health problems such as depression²⁸⁾.

3.2 Presenteeism

Presenteeism, which is defined as “the phenomenon that people, despite complaints and ill-health that should prompt them to rest and take sick leave, go to work in any case”³¹⁾, is a major factor in declining productivity^{32–34)}. We conducted our study with five of the seven items of the Japanese version of the Presenteeism Scale developed by Arakida *et al.*³⁵⁾, with the exception of two items with low item-total correlations. Responses were rated on a 4-point Likert scale (where 4 = often and 1 = not at all), with the total used as the score. Higher scores indicated higher presenteeism.

4 Demographic Characteristics

We measured relevant confounding variables age, owner position (founder, non-founder, or other), and working hours/days off per week.

Statistical Analysis

Of the 1,016 responses, data from 16 individuals with missing values and 11 outliers were excluded (3 respondents reported 7 days off, 1 respondent worked 0 hours, 2 respondents had the same number of years of experience as a manager as their age, and 5 respondents had 301 or more employees). Hence, 989 individuals were included in the final analysis. Before factor analysis was conducted based on the hypotheses of the occupational stress model (Fig. 1), the exclusion criteria for the job stress factors and modifying factors were established. The inter-item correlation was $r \geq .7$, and I-T correlations were $r \geq .7$ and $r < .3$ for the job stress and modifying factors, respectively^{36, 37}).

To gather social support data, we limited the selection of supporters in our survey. After analyzing the results, we focused on the types of supporters that over 50% of respondents rated as "dependable" or "fairly dependable." Furthermore, we removed the types of supporters that were deemed "not necessary" by approximately 20% of the respondents. All the analyses were conducted using IBM SPSS Statistics version 28.0 (IBM Corp., Armonk, NY, USA) for Windows.

Validity and Reliability

Regarding reliability and validity, content validity, structural validity, criterion-relevant validity, and internal consistency are discussed along with COSMIN³⁸).

1 Content Validity

We evaluated relevance, comprehensiveness, and comprehensibility with reference to “The COSMIN criteria and rating system for evaluating the content validity of PROMs”³⁹).

2 Structural Validity

Validity was assessed using structural and convergent validity. For the assessment of structural validity, exploratory factor analysis (maximum likelihood method, Promax rotation) was conducted separately for job stressors and modifiers based on the OSMS (Fig. 2) hypothesis. Further, to determine the number of factors, eigenvalues greater than one and smoothing out of the scree plot transition were selected. For job stress and modifying factors, we selected items that exhibited factor loadings of .50 or greater for one factor and .30 or lesser for the other factors, respectively⁴⁰). We repeated the exploratory factor analysis of the chosen items and adopted the results that had high validity.

3 Convergent Validity

Convergent validity was assessed using criterion-related validation with the psychological stress responses. Spearman’s rank correlation coefficients between the job stress factors and modifying factors with psychological stress responses were determined. Spearman’s rank correlation coefficients of .40–.70 and $> .70$ were considered moderate and strong, while .20–.40 and $< .20$ were considered weak and poor correlations, respectively.

Next, we conducted hierarchical multiple regression analyses with psychological distress and presenteeism as the dependent variables. In the first step, we entered the job factor and potential confounders into the model. In the second step, we included the main effects of Self-efficacy, WFC, family or co-owner illness, and social support as modifying factors. In the third step, we included the interaction term of the job factor and modifying factor. We calculated the R-squared (R²), adjusted R², and ΔR^2 (i.e., increase in R²

compared to the previous value) at each step to assess the model fit.

4 Internal Consistency

To evaluate reliability, internal consistency was calculated. Cronbach's α coefficient for each factor of the questionnaire was examined to assess internal consistency. For the psychological stress response scale (psychological distress and presenteeism), which is already a reliable and valid measure, we obtained Cronbach's α for the participants of this study.

Results

Participant Characteristics

Table 1 exhibits the characteristics of the 989 participants (932 men and 57 women). The average ages were 56.0 ± 9.3 years; the mean years of experience as an owner were $15.0 (\pm 11.0)$. Regarding company size, 58.4% of the enterprises had 20 or fewer employees. Common industries were manufacturing (18.7%) and services (excluding lodging, food, and beverage services) (18.6%). The average number of working hours per week was $42.1 (\pm 12.7)$, and the average number of days off per week was $1.9 (\pm 1.1)$. The proportion of the participants with a partner was 79.9%. Regarding educational attainment, 64.2% of the participants had a university degree or higher.

[Table 1 near here]

Validity and Reliability

1 Content Validity

This study was conducted as both a qualitative (interview) survey (19 participants) and a quantitative survey (1,016 participants). The interviews were conducted based on an interview guide extracted from the literature review, and the interviews were recorded and

transcribed verbatim. Four researchers were involved in this series of surveys and analyses. In addition, the opinions of current SME owners were confirmed to modify the wording of the survey questionnaire in terms that would be easier for SME owners to understand. These studies were conducted in accordance with “The COSMIN criteria and rating system for evaluating the content validity of PROMs”³⁹⁾ and resulted in a rating of “+” which indicates relevance, comprehensiveness, and comprehensibility.

2 Structural Validity

Table 2 presents the factor analysis results of the job stress factor items. Of the initial 29 items investigated as potential job stress factors, five were excluded from the results of the item analyses (correlation analysis and I-T analysis) (Appendix 1). An exploratory factor analysis was conducted with the remaining 24 items, which resulted in identifying three factors that consisted of 16 items based on the items’ contents: HRM, FM, and workload (Table 2). During factor analysis, the 9 items with low factor loadings were deleted, including “5. I have difficulty making decisions regarding management and dealing with issues” (Appendix 1).

[Table 2 near here]

Before conducting the factor analysis of modifying factors, seven main supporters were selected for social support. Of the 11 types of supporters, seven types were rated as depended on by over 50% of participants: professionals, family members, trusted customers, co-owners, friends, close owners, and financial institutions (in order from most to least; Table 3). Table 4 presents the factor analysis results of the modifying factor items. Of the initial 33 items investigated as potential modifying factors, two were excluded from the results of the item analyses (Appendix 2). An exploratory factor analysis was conducted with the

remaining 31 items, which resulted in identifying five factors that consisted of 27 items based on the items' contents: self-efficacy (an individual factor), social support and self-care (a buffering factor), WFC and Family or co-owner illness (non-work factor). During factor analysis, the four items with low factor loadings were deleted.

[Table 3 near here]

3 Convergent Validity

Table 5 depicts Spearman's rank correlation coefficients between the job stress factors, modifying factors, psychological stress responses, and subscales of each factor. The association of job stress factors with presenteeism ($r = 0.608$, $p < .01$) was stronger than that with psychological distress ($r = 0.357$, $p < .01$). Among the job stress factors, HRM had a large impact on presenteeism ($r = 0.602$, $p < .001$), next was FM ($r = 0.429$, $p < .001$), and then workload ($r = 0.289$, $p < .001$). For psychological distress, all subfactors were significantly correlated, but the differences were small. Each subfactor was significantly positively correlated with WFC and family or co-owner illness and significantly positively correlated with self-care.

Table 6 illustrates a hierarchical multiple regression analysis with psychological distress as the dependent variable. ΔR^2 increased significantly in Step 1 ($\Delta R^2 = 0.137$, $p < 0.001$), Step 2 ($\Delta R^2 = 0.185$, $p < 0.001$), and Step 3 ($\Delta R^2 = 0.014$, $p = 0.001$). All the modifying factors had significant main effects on psychological distress in Step 2 (self-efficacy: $\beta = -0.126$, $p < 0.001$, WFC: $\beta = 0.126$, $p < 0.001$, family or co-owner illness: $\beta = 0.059$, $p = 0.033$, self-care: $\beta = -0.287$, $p < 0.001$ and social support: $\beta = -0.097$, $p = 0.002$). In Step 3, the interaction terms of job stress factors \times WFC and social support significantly contributed to the explanation of psychological distress ($\beta = 0.470$, $p = 0.001$ and $\beta = -0.401$, $p = 0.002$, respectively).

Table 7 depicts a hierarchical multiple regression analysis with presenteeism as the dependent variable. ΔR^2 increased significantly in Step 1 ($\Delta R^2=0.370$, $p<0.001$) and Step 2 demonstrated a significant main effect on presenteeism ($\Delta R^2=0.046$, $p<0.001$). However the increase in Step 3 was insignificant ($\Delta R^2=0.003$, $p=0.409$). Additionally, the family or co-owner illness, self-care and social support of the modifiers had significant main effects on presenteeism in Step 2 ($\beta = 0.141$, $p < 0.001$, $\beta = -0.076$, $p = 0.009$ and $\beta = -0.058$, $p = 0.043$, respectively).

4 Internal Consistency

The Cronbach's α coefficients for the total and subscales of job stress factors were .89 for the total, .90 for HRM, .84 for FM, and .74 for workload. Similarly, the Cronbach's α coefficients for the subscale of modifying factors were .88 for self-efficacy, .79 for social-support, .80 for self-care, and .85 for WFC and .77 for family or co-owner illness (Table 4). We evaluated psychological distress and presenteeism as the two stress responses. The Cronbach's α coefficients of the six-item psychological distress scale and five-item presenteeism scale were 0.93 and 0.83, respectively.

[Tables 4, 5, and 6 near here]

Discussion

We conducted an Internet survey to develop the first occupational stress questionnaire for SME owners. As a result, we were able to develop a 43-item questionnaire with high validity and reliability based on the NIOSH occupational stress model. The developed scale was generally consistent with the hypotheses, and the items reflected the characteristics of SME owners. Further, the correlations between the job stress factors, stress responses, and modifying factors were in the theoretically expected directions.

The main feature of this questionnaire was that the job stress factors were related to

management (e.g., lack of human resources and funds), unlike individual stressors (e.g., quantity and quality of work) in the previous questionnaires for employees. Among the modifying factors, self-efficacy, WFC, and social support were existing factors, while co-owner illness and self-care were newly identified factors. In this study, WFC and family or co-owner illness increased the psychological stress response, while self-efficacy, self-care, and social support moderated the psychological stress response. These results were discussed individually using the COSMIN Risk of Bias checklist⁴⁰⁾ for content validity, structural validity, convergent validity, and internal consistency.

1 Content Validity

This study was conducted both qualitatively and quantitatively. Further, four researchers were involved in this series of surveys and analyses. In addition, these studies fulfilled a certain evaluation “The COSMIN Criteria and Evaluation System for Evaluating the Content Validity of PROMs.” Thus, the survey was considered appropriate and there is a certain level of content validity.

2 Structural Validity

Exploratory factor analysis revealed 16 items of the job stress factors (HRM, FM, and workload) and 20 items of the modifying factors (self-efficacy, self-care, WFC, and family and co-owner illness), which were consistent with the hypothesized model (OSMS, Fig. 2) and had high structural validity.

2.1 Job Stress Factors

Three subscales (HRM, FM, and workload) were identified as job stressors. The first factor, HRM, was an item indicating a lack of employee management and talented personnel. In Japan in particular, the chronic shortage of personnel in SMEs is an issue, and

in recent years, the sense of personnel shortage has become even stronger⁴¹⁾. It was suggested that the chronic shortage of personnel is a stress factor for SME owners who are unable to produce as much as they would like, despite demand.

Okamoto (2020) stated that there are two aspects to the shortage of human resources in SMEs: “quantitative human resource shortage” and “qualitative human resource shortage”⁴²⁾. Regarding the qualitative human resource shortage, there is a serious shortage of core human resources who are in a position to become a right-hand person of management and direct multiple employees⁴³⁾. Moreover, Takeuchi (1995) points out that as an organizational characteristic of SMEs, the qualitative imperfection of human resources must be supplemented by the competence of management, which increases the workload of management⁴⁴⁾, and this is thought to lead to the workload as the third factor.

The second factor, FM, was an item indicating monthly cash flow difficulties and the threat of bankruptcy. As reported by 60% of the SMEs who were “unable to respond to increased demand, resulting in lost opportunities” and experienced “difficulty in maintaining current enterprise scale”⁴³⁾, the inability to produce as planned leads to a decrease in income. In recent years, social risks such as the spread of the new coronavirus and natural disasters have taken a financial toll, especially on SMEs⁴⁵⁾.

For the third factor, workload, Takeuchi reported that occupational stress is high in SMEs due to a heavy workload and responsibility, as management responsibility is concentrated on individual owners in SMEs⁴⁴⁾. A recent survey found that small business owners’ average daily working hours are 9 hours and 26 minutes⁴³⁾, longer than employees’ average daily working hours of 7 hours and 42 minutes²¹⁾. In addition, the average number of holidays per week by small business owners is 1.17 days per week⁴³⁾, fewer than the 2.21 days for employees²¹⁾.

The reason for the shorter than average working hours and longer holiday hours of

the participants of this study compared to the statistical data may be that the majority (52%) of the participants in this study were in the manufacturing, construction, and services (excluding lodging, food, and beverage services) industries. The percentage of owners who worked less than 50 hours per week by industry was 67.3% overall, while the manufacturing, construction, and services industries accounted for higher percentages at 68.4%, 79.4%, and 76.0%, respectively⁴³⁾. Therefore, it can be assumed that the participants in this study were SME owners from industries with relatively short working hours. In future surveys, it is necessary to consider increasing the proportion of employees in the information and telecommunications industry, as well as the lodging, food, and beverage services industry, where the proportion of employees who work less than 50 hours per week is low, to avoid industry bias in future surveys.

2.2 Modifying Factors

Self-efficacy was extracted as the first factor in an exploratory factor analysis and was significantly negatively correlated with psychological stress responses, and significantly positively correlated with social support and self-care. Individual psychological capital⁴⁶⁾, characterized by self-efficacy and optimism, has been reported to positively influence work engagement (positive feelings toward work) by Xanthopoulos *et al.*⁴⁷⁾. The second factor, social support, was different from that of employees (supervisors and coworkers) in that it included professionals, family members, and trusted customers. Watanabe and Otsuka reported that self-efficacy was positively correlated with leisure time exercise activities and social support⁴⁸⁾. Self-care in the present study included leisure time exercise activities, suggesting that high self-efficacy cultivated by social support and self-care has a mitigating effect on psychological stress.

Moreover, the social support system among SME owners consisted of professionals, family members, and trusted customers, which was different from that of employees, who

relied on their supervisors and coworkers. The interviews conducted with SME owners revealed that their primary sources of social support were family members, business friends, and professionals⁴⁾, which aligns with the findings of this study.

3 Convergent Validity

3.1 Influence of Job Stress Factors

Three job stress factors were correlated with psychological distress and presenteeism, the association of the job stress factors with presenteeism was stronger than that with psychological distress. Moreover, Cocker *et al.* reported that high stress among SME owners is strongly associated with presenteeism³⁾, consistent with our findings. As SME owners are required to handle a wide range of tasks, including administrative and frontline tasks⁴⁹⁾, the impact of presenteeism is directly related to low firm performance⁵⁾.

3.2 Influence of Modifying Factors

In the hierarchical multiple regression analysis, the results exhibited a significant main effect for all modifying factors in Step 2 on psychological distress as the dependent variable. Additionally, in Step 3, it was observed that WFC increased psychological distress, while social support decreased psychological distress, and there was an interaction between the two.

WFC is often reported to be due to excessive workload and insufficient time for family^{46, 47)}. In Japan, time conflicts owing to balancing work and family life have also been reported^{48, 49)}. In particular, SME owners are on call 24 hours a day and on holidays⁹⁾, which could result in a higher frequency of time conflicts than employees, who generally have a five-day workweek. As a result, WFC is associated with impaired mental health⁵⁰⁾ and related outcomes such as depression, anxiety, and psychological strain⁵¹⁾, consistent with our findings.

To alleviate WFC, Japan recently implemented measures to improve employment conditions, such as reviewing work styles and enacting the Childcare and Family Care Leave Law⁵²). Reforms encouraging taking time off, securing replacement personnel, and improving employment environments have also been implemented to reduce presenteeism⁵³). However, although SME owners can improve the employment conditions in their firms, they are unlikely to personally benefit from such efforts, therefore, it was suggested that SME owners need to manage their own work style and healthcare.

Although many studies (e.g., Inoue R et al., 2022, George ES et al., 2020)^{54, 55}) have pointed out that social support alleviates psychological distress among employees, the results of this study demonstrated that social support suppressed psychological distress and presenteeism among SME owners.

It has been pointed out that the problem of organizational imperfections in SMEs, unlike large firms, is that the psychological burden increases due to the lack of personnel to support decision making by SME owners^{43,56}). These results suggest that the creation of personal networks among owners and individualized professional support for owners by management associations can lead to stress prevention measures.

Self-care was observed to have a significant main effect on both psychological distress and presenteeism. Self-care, such as getting enough sleep and exercising moderately, has been reported to be effective in preventing psychological stress among employees (Hammer LB & Sauter S, 2013, Calogiuri et al., 2016)^{57, 58}). Additionally, it was observed to be equally effective for SME owners. Hence, SME owners should focus on improving the robustness of their psychological distress by self-care, for example, by implementing adequate diet, sleep, and exercise into their lifestyle. The negative impact of self-efficacy on psychological distress was also observed. Bandura cites achievement experiences as one way to increase self-efficacy²²). Based on Bandura's theory and previous

studies on self-efficacy-related statements made by SME owners interviewed (e.g., "I am close to the image of my ideal company", "My employees have grown," etc.), it was suggested that accumulating a series of business achievements can lead to increased self-efficacy²⁰).

4 Internal Consistency

Cronbach's α was greater than .70 or higher for all factors including subfactors; both the job stress and modifying factors showed high internal consistency. For social support, the number of supporters was reduced from 11 to 7 items, but Cronbach's α was 0.81, showing high internal consistency. These results suggest that the scale is highly reliable.

In conclusion, we successfully developed an occupational stress scale for SME owners with high validity and reliability. Applying this scale enables the assessment of the overall stress among SME owners, facilitating the implementation of strategies to mitigate stress-inducing factors and enhance stress-alleviating factors. Future research for generalization of the scale and score rating is recommended.

Limitations

This study has some limitations. First, sampling bias could have occurred owing to the exclusive use of an Internet survey. Hence, efforts should be made to reduce sampling bias by conducting in-person surveys. Second, the survey was biased toward male participants, which could have hampered an investigation of the effects of sex differences. In Japan, 8.4% of the approximately 1.19 million companies nationwide have women owners⁵⁹), making it difficult to gather women survey targets. In the future, we would like to increase the number of women participants and aim for an analysis that takes sex differences into account. Third, the cross-sectional design of this study prevented confirmation of many

other properties, such as content validity, reliability (narrow definition), and measurement errors. Fourth, this study was influenced by socioeconomic statuses during the survey due to the COVID-19 pandemic. The revenue of some SMEs could have decreased at this time, while others could have seen their financial situation improve owing to pandemic-related subsidies provided by the government. Therefore, future research could readjust the survey items when surveying in the post-pandemic era. Fourth, as participants were those SME owners with the capacity to cooperate with the survey, only SME owners with relatively stable business conditions may have participated. Fifth, the survey items in this study were developed based on previous research on occupational stress among SME owners and interviews. Hence, the job stress factors of SME owners might have been inadequately understood. Improving the accuracy of the survey items and reconsidering the question items to reflect changes in socioeconomic conditions and the situation of SME owners is necessary in the future.

Future Research Directions

There are three directions for future research. First, after adjusting the number of items for each factor and the wording of the questions, we would like to conduct surveys in other countries to increase the number of participants, further improve the reliability and validity, and consider how scores and cutoff values are calculated for the questionnaire. Second, the results of the analysis suggested measures to reduce psychological stress responses, and we would like to examine measures to prevent stress. Third, this study develops a “job stress scale” to measure the degree of stress among SME owners; however, we have discovered that the job stress factors (human resource/FM) of SME owners are original (i.e., not the same stress factors as other employees). Thus, we would like to pursue another study for the “job stressors scale” for SME owners, not the “job stress scale.”

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[Appendix 1. and 2. near here]

Table 1. Participants' characteristics

Variable	Mean	SD	n	%
Age (years)	56.0	9.3		
Position as owner				
Founder			396	40
Years of experience as an owner	15.0	11.0		
Company size (Number of employees)				
5–10 employees			336	34.0
11–20 employees			241	24.4
21–50 employees			225	22.8
51–100 employees			104	10.5
≥ 101 employees			83	8.4
Industry				
Manufacturing			185	18.7
Services (excluding lodging, food, and beverage services)			184	18.6
Construction			145	14.7
Wholesale and retail trade			135	13.7
Information and communication technology industry			75	7.6
Transport and postal industry			49	5.0
Medical care and welfare			52	5.3
Lodging, food, and beverage services			31	3.1
Finance and insurance			25	2.5
Electricity, gas, heat supply, and water supply			9	0.9
Other			99	10.0
Working hours/week	42.1	12.7		
Days off/week	1.9	1.1		
Marital status				
With partner			790	79.9
Educational attainment				
High school			212	21.4
College or higher professional school			142	14.4
University or higher			635	64.2

Note. N = 989 (932 men and 57 women), average ages were 56.0 ± 9.3 years and 47.0 ± 12.7 for

men and women, respectively.

Table 2. Results from the factor analysis of question items related to the job factor questionnaire

Job stress factor item	Factor loading		
	1	2	3
Human resource management α : .90			
23 I have difficulty in responding to the diverse values of employees.	.85	-.02	.02
22 I have difficulty in providing guidance to veteran employees.	.79	-.05	.00
25 I have difficulty in communicating with employees.	.79	-.03	-.01
27 The awareness of work/life balance has made a difference to me and our employees.	.75	.01	.02
29 I have difficulty in changing the organizational culture.	.71	-.03	.00
26 There is emotional conflict among employees.	.69	-.03	.06
19 My company cannot get the personnel it needs.	.63	-.01	-.01
20 My company is losing talented employees.	.59	.08	.01
Financial management α : .84			
11 I struggle with monthly cash flow.	-.04	.90	-.05
13 I sometimes feel on the verge of bankruptcy.	.02	.80	.00
12 I am forced to invest my own funds to run my business.	-.16	.68	.14
14 My company revenues are low.	.26	.57	-.07
10 I cannot invest enough money in product development, technology, etc.	.27	.52	-.04
Workload α : .74			
2 It is a job that does not allow you to take time off.	-.01	-.01	.84
3 It is a job where work and personal life are inseparable.	.03	.10	.69
1 I have to be on call 24 hours a day.	.05	-.03	.56
Eigenvalue	6.11	1.45	1.04
Contribution rate	38.20	9.08	6.52
Cumulative contribution rate	38.20	47.29	53.81

Note. N = 989. The questionnaire for the job stress factors consisted of 29 items, and responses were rated on a 4-point Likert scale (4 = agree, 3 = agree to some extent, 2 = somewhat disagree, and 1 = disagree). Five items were excluded from item analyses' results (correlation analysis and I-T analysis), and an exploratory factor analysis (maximum-likelihood method, Promax rotation) was conducted with the remaining 24 items. To determine the number of factors, eigenvalues of > 1 and smoothing out of the scree plot transition were selected. We selected items that exhibited factor loadings of .50 or greater for one factor and .30 or lesser for the other

factors, respectively. The Cronbach's α coefficients for the subscale of job stress factors were .90 for Human resource management, .84 for financial management, and .74 for Workload, respectively, and .89 for the combined job stress factors.

Table 3. Social support supporters and level of need for each supporter

Type of supporter	Respondents who said they were a reliable supporter		Respondents who said they were not a necessary supporter	
	No.	%	No.	%
Professionals (e.g., tax accountants, lawyers)	707	71.5	40	4.0
Family members	646	65.3	46	4.7
Trusted customers	621	62.8	58	5.9
Co-owner	572	57.8	57	5.8
Friends	571	57.7	47	4.8
Close owners	545	55.1	50	5.1
Financial institutions	506	51.2	87	8.8
Personal life supporters (e.g., including childcare, housework)	324	32.7	201	20.3
Business supporters (e.g., coaches, consultants)	270	27.3	177	17.9
Investors	232	23.5	223	22.5
Mental supporters (e.g., mental coaches and counsellors)	154	15.5	231	23.4

Note. N = 989. In total, 11 different persons were listed and the question “Is the following person reliable supporter?” was asked.

Responses were rated on a 5-point Likert scale (4 = dependable, 3 = fairly dependable, 2 = not much dependable, 1 = not dependable, and 0 = not necessary). We identified support types for whom respondents who answered 3 or 4 as a “reliable supporters.”

Furthermore, those supporters who were 0 = not necessary were identified as “not necessary supporters.”

Table 4. Results from the factor analysis of question items related to the modifying factor questionnaire

	1	2	3	4	5
Self-efficacy (individual factor) α: .88					
8 I feel that our employees have improved their motivation and skills.	0.82	-0.09	-0.06	-0.04	0.04
6 I feel that our employees have a challenging job.	0.79	0.04	-0.11	-0.07	0.05
12 I feel that my company has been able to handle difficult assignments from customers.	0.77	-0.03	0.02	0.04	-0.02
9 I feel that I am getting closer to the ideal image of my company.	0.74	-0.01	0.05	0.03	-0.08
7 I feel that our customers value our business and employees.	0.71	-0.05	0.02	0.00	0.00
10 I feel that our business is successful.	0.69	0.02	0.05	0.09	-0.04
11 I personally feel that I have done a good job.	0.63	0.05	-0.08	-0.06	0.08
14 I can cope well with stressful problems at work.	0.60	0.05	0.10	-0.05	-0.02
Social support (buffering factor) α: .79					
32 Close owners (are dependable).	0.00	0.70	-0.01	0.01	-0.06
33 Financial institutions (are dependable).	-0.07	0.68	-0.03	0.02	0.03
30 Co-owner (is dependable).	0.05	0.66	-0.04	-0.07	-0.02
27 Professionals (are dependable).	0.09	0.60	-0.05	-0.10	0.03
31 Friends (are dependable).	-0.01	0.58	0.09	-0.01	0.01
29 Trusted customers (are dependable).	0.11	0.53	0.02	-0.01	0.00
28 Family members (are dependable).	-0.04	0.50	0.05	-0.03	0.09
Self-care (buffering factor) α: .80					
19 I try to have time for diversions (exercise, hobbies, etc.).	-0.01	-0.02	0.84	-0.02	0.00
20 I balance my health care with my work.	0.05	-0.05	0.79	-0.03	-0.01
24 I have time for dinners, etc. with people close to me.	-0.02	-0.05	0.59	-0.09	0.03
22 I spend time alone.	0.01	0.03	0.55	-0.06	-0.02
21 I have regular checkups or continue to receive appropriate medical care.	0.04	0.07	0.54	0.13	-0.03
23 I spend time with my family.	-0.05	0.10	0.52	-0.03	0.09
Work-family conflict (non-work factor) α: .85					
17 I neglect housework/childcare/caregiving/study because of my job.	0.01	-0.01	0.06	0.92	-0.02
16 I am physically and mentally drained from housework, childcare, caregiving, etc.	-0.03	-0.02	0.07	0.79	0.02
18 I do not have the energy to engage in leisure activities with my spouse/family/friends because of my job.	0.03	0.01	-0.13	0.73	0.03

15	I have difficulty balancing work with family and personal time.	0.00	0.04	-0.17	0.54	0.06
Family or co-owner illness (non-work factor) α: .77						
26	I worry about my family member's illness.	-0.01	-0.04	0.06	0.02	0.90
25	I worry about the co-owner's illness.	0.01	0.07	-0.03	0.04	0.62
	Eigenvalue	6.76	3.19	2.45	1.62	1.49
	Contribution rate (%)	24.15	11.38	8.74	5.79	5.34
	Cumulative contribution rate (%)	24.15	35.53	44.26	50.06	55.39

Note. N = 989. The questionnaire for the modifying factors consisted of 33 items, and responses were rated on a 4-point Likert scale (4 = agree, 3 = agree to some extent, 2 = somewhat disagree, and 1 = disagree). The extraction method was an exploratory factor analysis (maximum-likelihood method, Promax rotation). To determine the number of factors, eigenvalues of >1 and smoothing out of the scree plot transition were selected. We selected items that exhibited factor loadings of .50 or greater for one factor and .30 or lesser for the other factors, respectively. Cronbach's α coefficients for the subscale of modifying factors were .88 for self-efficacy, .79 for social-support, .80 for self-care, and .85 for WFC and .77 for family or co-owner illness.

Table 5. Relationship between the job stress/modifying factors and job stress responses

Variable	α	M	SD	Job stress factors			Modifying factors					
				Total	1	2	3	4	5	6	7	8
Job stress factors												
1. HRM	0.90	2.23	0.66	.880**								
2. FM	0.84	2.22	0.78	.788**	.507**							
3. Workload	0.74	1.91	0.83	.588**	.305**	.350**						
Modifying factors												
4. Self-efficacy	0.88	2.65	0.55	-.071*	-.104**	-.071*	.072*					
5. WFC	0.80	1.90	0.71	.427**	.355**	.294**	.376**	-.160**				
6. Fa/Co-illness	0.85	2.45	0.89	.255**	.226**	.192**	.163**	.010	.170**			
7. Self-care	0.77	2.93	0.60	-.293*	-.236**	-.215**	-.244*	.320**	-.412**	-0.05		
8. Social support	0.81	2.80	0.61	-.098*	-.122**	-.060	-0.01	.393**	-.160**	0.05	.409**	
Psychological stress responses												
9. Psychological distress	0.93	4.82	4.98	.357**	.297**	.290**	.256**	-.320**	.391**	.168**	-.450*	-.298**
10. Presenteeism	0.83	10.45	3.02	.608**	.602**	.429**	.289**	-.222**	.425**	.203**	-.323*	-.184**

Note. N = 989. Spearman's rank correlation coefficient; * $p < .05$. ** $p < .01$.

1. HRM: Human resource management

2. FM: Financial management

5. WFC: work–family conflict

6. FaCo-illness: Family or Co-owner illness

Table 6. Multiple regression analysis with psychological distress as the dependent variable

Effect	Step 1				Step 2				Step 3			
	β	95% CI		<i>p</i>	β	95% CI		<i>p</i>	β	95% CI		<i>p</i>
		LL	UL			LL	UL			LL	UL	
Main factor												
Job Stress Factors (A)	0.365	2.621	3.619	0.000	0.196	1.167	2.189	0.000	0.078	-3.479	2.948	0.871
Sex	0.081	0.465	2.975	0.000	0.060	0.151	2.398	0.019	0.056	0.079	2.313	0.036
Years of owner experience	-0.044	-0.046	0.007	0.139	0.011	-0.019	0.029	0.693	0.006	-0.021	0.026	0.819
Modifying factor												
Self-efficacy					-0.126	-1.664	-0.612	0.000	-0.224	-3.569	-0.481	0.010
WFC ¹					0.126	0.463	1.307	0.000	-0.194	-2.740	0.012	0.052
Fa/Co-illness ²					0.059	0.026	0.632	0.033	0.153	-0.189	1.902	0.108
Self-care					-0.287	-0.287	-2.868	0.000	-0.380	-4.795	-1.459	0.000
Social support					-0.097	-0.097	-1.039	0.002	0.196	0.030	2.557	0.045
Interaction term												
A × Self-efficacy									0.102	-0.489	1.065	0.467
A × WFC									0.470	0.417	1.583	0.001
A × Fa/Co-illness									-0.125	-0.708	0.239	0.331
A × Self-care									0.132	-0.396	1.102	0.355
A × Social support									-0.401	-1.556	-0.354	0.002
Model fit indicates												
	Estimate	<i>p</i>			Estimate	<i>p</i>			Estimate	<i>p</i>		
R ²	0.137	-			0.322	-			0.336	-		
Adjusted R ²	0.134	-			0.316	-			0.327	-		
ΔR^2	0.137	<0.001			0.185	<0.001			0.014	<0.001		

Note. N = 989. We conducted a hierarchical multiple regression analysis consisting of four models with psychological stress(K6) as dependent variables.

¹ WFC: work–family conflict

² Fa/Co-illness: Family or Co-owner illness

Table 7. Multiple regression analysis with presenteeism as the dependent variable

Effect	Step 1				Step 2				Step 3			
	β	95% CI		<i>p</i>	β	95% CI		<i>p</i>	β	95% CI		<i>p</i>
		LL	UL			LL	UL			LL	UL	
Main factor												
Job Stress Factors (A)	0.608	2.895	3.412	0.000	0.502	2.316	2.891	0.000	0.573	1.319	4.618	0.000
Sex	-0.001	-0.667	0.632	0.958	-0.019	-0.878	0.387	0.446	-0.020	-0.891	0.376	0.425
Years of owner experience	0.010	-0.011	0.017	0.681	0.033	-0.004	0.022	0.188	0.031	-0.005	0.022	0.211
Modifying factor												
Self-efficacy					0.033	-0.576	0.016	0.188	0.031	-0.005	0.022	0.211
WFC ¹					-0.051	0.364	0.839	0.064	-0.055	-1.174	0.577	0.504
Fa/Co-illness ²					0.141	-0.664	-0.095	0.000	0.066	-0.498	1.062	0.478
Self-care					-0.076	-0.455	-0.008	0.009	-0.103	-1.458	0.434	0.288
Social support					-0.058	0.035	0.375	0.043	0.091	-0.354	1.080	0.320
Interaction term												
A × Self-efficacy									-0.020	-0.475	0.406	0.876
A × WFC									0.115	-0.182	0.479	0.379
A × Fa/Co-illness									0.042	-0.357	0.493	0.753
A × Self-care									-0.208	-0.640	0.041	0.085
A × Social support									-0.005	-0.274	0.263	0.967
Model fit indicates												
R ²	Estimate	<i>p</i>			Estimate	<i>p</i>			Estimate	<i>p</i>		
R ²	0.370	-			0.416	-			0.419	-		
Adjusted R ²	0.368	-			0.411	-			0.411	-		
ΔR^2	0.370	<0.001			0.046	<0.001			0.003	0.409		

Note. N = 989. We conducted a hierarchical multiple regression analysis consisting of four models with presenteeism as dependent variables.

¹ WFC: work–family conflict

² Fa/Co-illness: Family or Co-owner illness

Appendix 1. Job stress factor items

Item	M	SD	Deleted items and reason
1 I have to be on call 24 hours a day.	1.86	1.07	
2 It is a job that does not allow you to take time off.	1.70	0.92	
3 It is a job where work and personal life are inseparable.	2.16	1.08	
4 I am responsible for the lives of my company’s employees and their families.	3.34	0.90	Ceiling effect
5 I have difficulty making decisions regarding management and dealing with issues.	2.55	0.96	
6 I find it difficult to take over the business.	2.50	1.05	
7 I have diverse business responsibilities (multitasking).	2.85	0.97	
8 Customers look down on SME owners.	2.08	0.94	
9 Customers make strict demands on the company in terms of price, construction schedule, technical level, etc.	2.32	0.93	
10 I cannot invest enough money in product development, technology, and so on	2.37	0.95	
11 I struggle with monthly cash flow.	2.00	0.97	
12 I am forced to invest my own funds to run my business.	2.08	1.10	
13 I sometimes feel on the verge of bankruptcy.	2.11	0.98	
14 My company revenues are low.	2.52	0.97	
15 I am successfully dealing with various management problems.	2.27	0.77	I-T correlation: r < .3
16 My company is compliant with laws and regulations.	2.05	0.76	I-T correlation: r < .3
17 I lack basic knowledge of management.	2.27	0.84	
18 My company is able to cope with socioeconomic situations (infectious disease epidemic, financial crisis, etc.).	2.33	0.77	
19 My company cannot get the personnel it needs.	2.70	0.91	
20 My company is losing talented employees.	2.01	0.84	
21 My company cannot retain employees.	1.92	0.83	inter-item correlation: r > .7
22 I have difficulty in providing guidance to veteran employees.	2.21	0.90	
23 I have difficulty in responding to the diverse values of employees.	2.22	0.83	
24 It is difficult to improve employees’ work skills (human resource development).	2.40	0.87	inter-item correlation: r > .7
25 I have difficulty in communicating with employees.	2.13	0.85	
26 There is emotional conflict among employees.	2.04	0.85	
27 The awareness of work/life balance has made a difference to me and our employees.	2.20	0.81	
28 I have difficulty managing diverse human resources (e.g., foreigners and people with disabilities).	1.95	0.91	
29 I have difficulty in changing the organizational culture.	2.33	0.90	

Note. The questionnaire responses were rated on a 4-point Likert scale (4 = agree, 3 = agree to

some extent, 2 = somewhat disagree, and 1 = disagree).

Appendix 2. Modifying factor items (excluding the social support and family or co-owner illness items)

Item	M	SD	Deleted items and reason
1 I make management decisions that respect the social values of my company.	2.25	0.78	I-T correlation: r < .3
2 I try to manage my company in a way that is faithful to its management philosophy.	2.12	0.79	I-T correlation: r < .3
3 Our employees do not understand the management policy.	1.96	0.78	
4 I have a problem that I cannot discuss with anyone.	2.46	1.00	
5 I feel that I am ultimately responsible for my company.	3.09	0.94	
6 I feel that our employees have a challenging job.	2.67	0.72	
7 I feel that our customers value my business and employees.	2.81	0.74	
8 I feel that our employees have improved their motivation and skills.	2.67	0.72	
9 I feel that I am getting closer to the ideal image of my company.	2.43	0.72	
10 I feel that my business is successful.	2.51	0.74	
11 I personally feel that I have done a good job.	2.58	0.74	
12 I feel that my company has been able to handle difficult assignments from customers.	2.75	0.70	
13 I feel energized in my work.	2.72	0.77	
14 I can cope well with stressful problems at work.	2.74	0.73	
15 I have difficulty balancing work with family and personal time.	2.18	0.84	
16 I am physically and mentally drained from housework, childcare, caregiving, etc. by my job.	1.71	0.85	
17 I neglect housework, childcare, caregiving, and studying.	1.79	0.85	
18 I do not have the energy to engage in leisure activities with my spouse/family/friends because of my job.	1.92	0.88	
19 I try to have time for diversion (exercise, hobbies, etc.).	2.99	0.81	
20 I balance my health care with my job.	2.97	0.74	
21 I have regular checkups or continue to receive appropriate medical care.	3.03	0.90	
22 I spend time alone.	3.07	0.79	
23 I spend time with my family.	3.01	0.85	
24 I have time for dinners, etc. with people close to me.	2.50	0.98	
25 I worry about the co-owner's illness.	2.33	0.99	
26 I worry about my family member's illness.	2.57	0.98	
27 Professionals (are dependable).	2.85	1.04	
28 Family members (are dependable).	2.56	1.13	
29 Trusted customers (are dependable).	2.60	1.08	
30 Co-owner (is dependable).	2.57	1.11	
31 Friends (are dependable).	2.58	1.09	
32 Close owners (are dependable).	2.52	1.07	
33 Financial institutions (are dependable).	2.38	1.15	

Note. The questionnaire responses were rated on a 4-point Likert scale (4 = agree, 3 = agree to

some extent, 2 = somewhat disagree, and 1 = disagree).

Fig. 1. Scale development procedure for SME owners

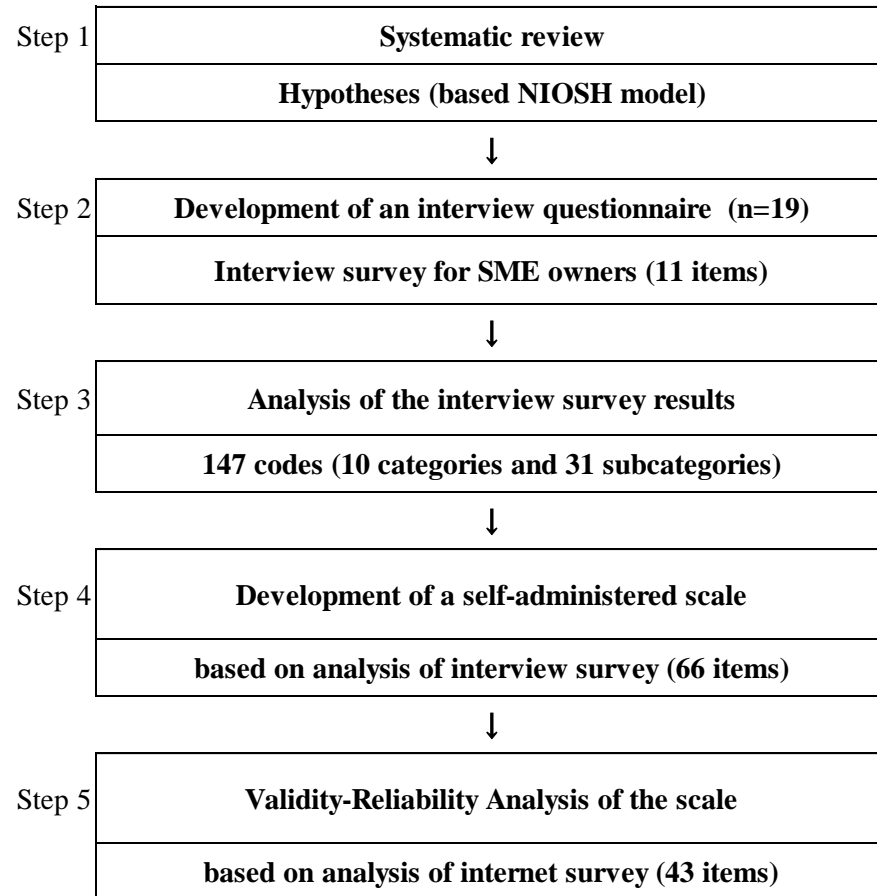
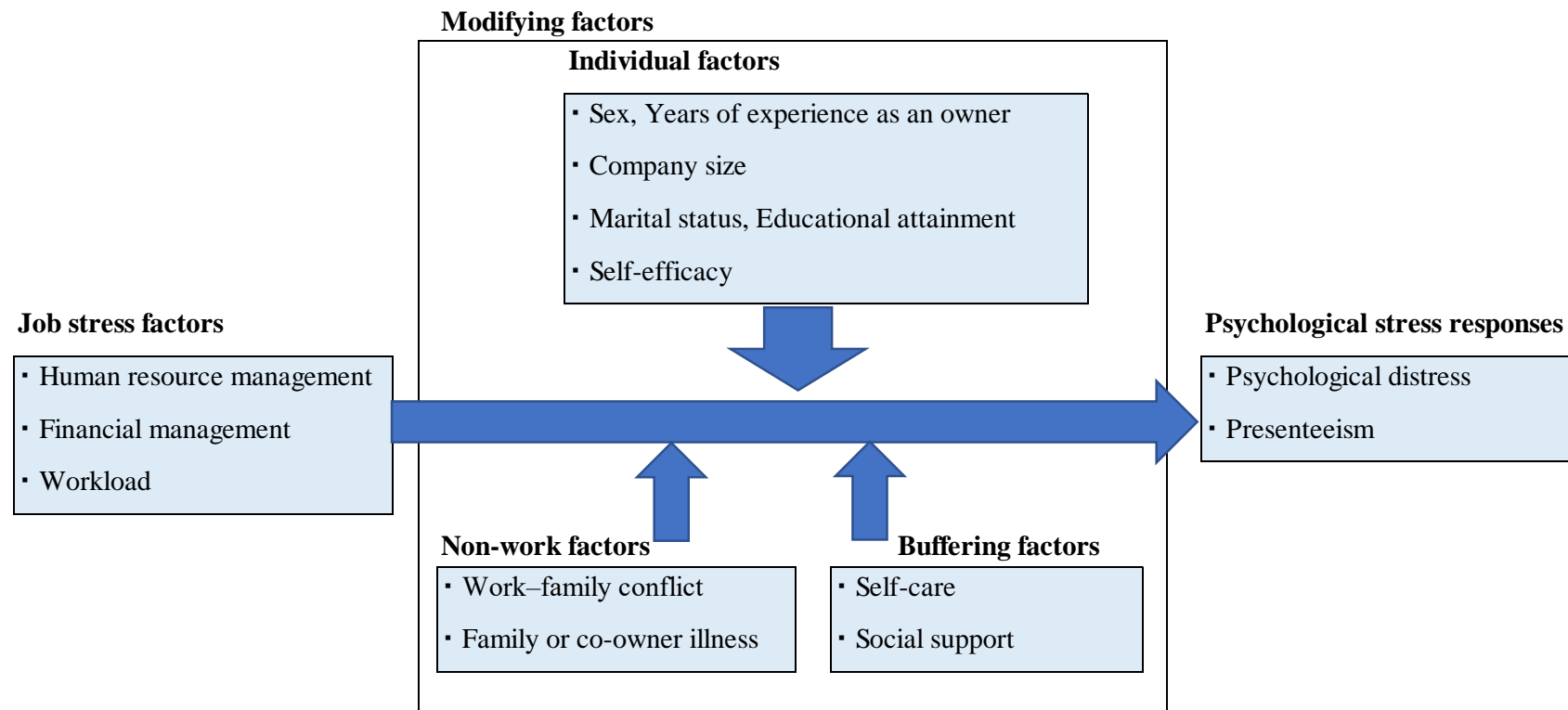


Fig. 2. Hypothesized occupational stress model for SME owners based on NIOSH job stress model



Note. We used the National Institute of Occupational Safety and Health (NIOSH) model of job stress and health as the theoretical model. The NIOSH model, proposed by Hurrell and McLaney (1988), is a comprehensive framework that demonstrates how work-related stressors affect health.