Sense of Coherence (SOC) and Resilience Modify Occupational Stress

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To prevent poor mental health status in workers, it is necessary to minimize workplace stress and strengthen the stress resilience of individual workers. We focused on the sense of coherence (SOC) as an individual stress-coping ability and discussed SOC and occupational stress. Furthermore, we investigated previously published studies of resilience, which is a similar concept to SOC that has recently gained attention, and of occupational stress. The results indicated that specific support that was designed to increase SOC and resilience to prevent poor mental health status required the construction of a program including a cognitive–behavioral therapy approach, improvements to daily living habits, and acquisition of communication skills and that the effects of this program then need to be verified.

Key words: sense of coherence (SOC), resilience, occupational stress, mental health, health behavior

Introduction

In recent years, workers have been required to swiftly respond to continually changing technology and systems as computerization and globalization have been expanding rapidly. The collapse of the system of lifetime employment has also meant that marked changes have occurred in the types of employment. In a working environment in which ability and results are prioritized, the issue of employment disparity has emerged because the number of non-regular employees who are exploited with low wages has surged.

According to the 2012 Survey on State of Employees’ Health (Ministry of Health, Labour and Welfare)1), the proportion of workers experiencing strong anxiety, worry, and stress regarding their job or working life exhibited an increasing trend, reaching 60.9% (58.0% according to the 2007 survey). Workers were most troubled by problems with interpersonal relationships at the workplace (41.3%), which was followed by problems with work quality (33.1%) and workload (30.3%). The proportion of offices in which a worker or workers suffered from a mental disorder as a result of such worries regarding work and took a continuous leave of 1 month or longer or quit their job was 8.1% (number of offices: 9,283).

Poor mental health status includes “not only psychiatric disorders or suicidal behavior classified as psychiatric or behavioral disorders but also a wide range of psychiatric and behavioral problems that could affect the worker’s mental and physical health and the quality of their social life and lifestyle, such as stress, strong worries and anxiety” (Guidelines for Maintaining and Improving Worker Mental Health). The proportion of offices with mental health care initiatives in place for workers suffering from poor mental health or the workforce as a whole has increased to 47.2% (43.6% in the 2011 survey). Such initiatives are particularly common (over 90%) in offices with a total workforce of 300 employees or more.

However, many small- and medium-sized busi-
nesses (52.8%) with small numbers of employees have no mental health care initiatives in place for a number of reasons, including "do not feel it is necessary," "unsure how to put such initiatives in place," and "have no specialized staff." Although no mental health care initiatives were in place, the small number of employees at such companies may make it easier to make adjustments with interpersonal relations, allowing for the maintenance of an environment with a strong sense of interpersonal cooperation.

In mental health care, the prevention of poor mental health status requires not only the reduction of workplace stress factors but also the fortification of stress tolerance in individual workers. For workers to implement self-care to combat their own stress, it is important that they know and understand the skills required for dealing with stress, are aware of one's own early stress reactions, and improve one's stress-coping abilities. Based on these facts, we have focused on the sense of coherence (SOC) as individual stress-coping abilities.

**Sense of coherence (SOC) and occupational stress**

Approximately 30 years have passed since Aaron Antonovsky proposed the salutogenic model of health. Antonovsky (1987) conducted a study in Israel in the early 1970's that targeted menopausal women who had experienced incarceration in concentration camps in their youth and investigated how the trauma affected their mental and physical health. In the concentration camp survivor group, 30% of the women had good mental and physical health, whereas 70% had poor mental and physical health. In the control group, 50% had good mental and physical health and 50% had poor mental and physical health. The 30% of the concentration camp survivor subjects who had experienced extremely harsh conditions but who had subsequently maintained good health viewed their difficult experience as fodder for human growth and were living cheerfully.

Antonovsky (1987) proposed a global orientation to life-world that was composed of three types of confidence as psychosocial characteristics that were shared by the concentration camp survivors who were able to maintain good health and conceptualized this as sense of coherence (SOC). Antonovsky reported that people with high SOC mobilize generalized resistance resources comprising a combination of internal resources of the individual (personality, character, temperament, etc.) and external resources from around them (objects, people, networks, knowledge, etc.) to allow them to reduce stress-loading factors.

The SOC concept, which is based on the salutogenic model, has attracted research attention in the population health field. One's SOC is believed to express the extent to which they have a persistent, enduring, but dynamic feeling of confidence: (1) the stimuli deriving from their internal and external environments in the course of living are structured, predictable, and explicable (comprehensibility); (2) resources are available to them to meet the demands posed by these stimuli (manageability); and (3) such demands are challenges worthy of investment and engagement (meaningfulness).

Previous SOC studies targeting workers have reported the following findings. Several studies have indicated that SOC modifies job stress responses. For example, having a strong SOC protects individuals from the effects of stressors at work. Health social workers with a strong SOC experience less burnout than those with a weak SOC. SOC buffers the effects of stressful life events on individuals' mental health status. A study of Japanese civil servants indicated that having a stronger SOC was associated with fewer days of absence from work and fewer adverse physical health symptoms. Among resident physicians, an increase in psychiatric complaints, as measured by General Health Questionnaire (GHQ) scores, was associated with a weak SOC and adverse work conditions, as assessed by the Brief Job Stress Questionnaire (BJSQ).

Our previous study demonstrated that GHQ scores were positively associated with job demands as measured by the BJSQ, whereas the scores were inversely associated with SOC scores among Japanese workers in the manufacturing industry, suggesting that having a stronger SOC can reduce the adverse effects of job stress, such as psychiatric complaints.

The results of the gender-specific analysis were as follows. SOC was inversely associated with stress
responses, i.e., tension, fatigue, anxiety, depression, and subjective symptoms, and was positively associated with vigor. Stress responses and self-rated health were adversely associated with job stressors, such as job demand, low support, and job aptitude, in males. Similarly, SOC was inversely associated with tension, depression, and subjective symptoms and positively associated with vigor. Stress responses were adversely associated with job stressors, such as job demand and low support, in females.

The results of a survey conducted in 2013 were as follows. Self-administered questionnaires were distributed among 458 workers (clerical, trade, sales, personnel management, and transport workers, etc.) of a company in Tokyo and recovered by mail. The questionnaires included questions on the demographic variables and exercise habits of the subjects, the SOC (13-item scale), the Center for Epidemiologic Studies–Depression Scale (CES-D), and the International Physical Activity Questionnaire (IPAQ short and revised version). All of these scales were the Japanese version. Complete responses were returned from 115 workers (25.1%) and subjected to analysis. The mean age of the 115 respondents was 46.5 years with a standard deviation (SD) of 11.4 years. They consisted of 90 males (78.3%) and 25 females (21.7%), with mean ages of 49.4 (SD, 10.1) and 35.8 (SD, 9.5) years, respectively (p < 0.001). The results showed that the SOC scores (mean, 59.4; SD, 11.4) were significantly correlated with the CES-D scores (mean, 10.2; SD, 8.0) in 115 subjects (r = −0.679, p < 0.001, Figure-1). The IPAQ scores were significantly higher and the CES-D scores were significantly lower in 61 subjects who exercised regularly compared with those in 54 subjects who did not exercise regularly (Table-1). With a mean SOC score of 59, 115 workers were divided into the high and low SOC groups. In the 61 workers who exercised regularly, the proportion of subjects with high SOC was significantly higher compared with those who did not exercise regularly (Table-2). There were no significant differences in age or gender distribution between the workers with and without regular exercise (p > 0.05).

The conclusions from the survey results were that regular exercise appeared to be related to better mental health status. The CES-D scores correlated with the SOC scores as previously reported, suggesting that a higher SOC is a key for good mental health status. Statistical adjustment

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<table>
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<tr>
<th>Table-1</th>
<th>IPAQ, CES-D and SOC scores in 61 and 54 subjects with and without exercise practice, respectively</th>
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<tbody>
<tr>
<td>Scores</td>
<td>With exercise practice (n=61)</td>
</tr>
<tr>
<td>IPAQ [MET-minutes/week]</td>
<td>2194.1 (1616.1)</td>
</tr>
<tr>
<td>CES-D</td>
<td>8.6 (7.0)</td>
</tr>
<tr>
<td>SOC (13-item scale)</td>
<td>61.3 (10.8)</td>
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Values are mean (SD).

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<tr>
<th>Table-2</th>
<th>Comparison of exercise practice between low and high SOC subjects</th>
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<tr>
<td></td>
<td>Low SOC</td>
</tr>
<tr>
<td>Exercise (+)</td>
<td>24 (39.3)</td>
</tr>
<tr>
<td>Exercise (-)</td>
<td>31 (63.0)</td>
</tr>
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Values are n (%). p = 0.015 (chi-square test).
of the confounding factors is an issue to examine in the future.

Recently, a concept similar to SOC has been proposed. This is the concept of resilience in educational sites and workplaces. People with high SOC can control their emotions and may have high human skill abilities that allow them to effectively utilize the human, physical, and psychosocial resources around them. That is, the elements shared by the concepts of SOC and resilience make up the strong communication ability to create interpersonal relationships and skillful utilization of the available resources for support.

### Resilience

There is no fixed definition of resilience, which is generally considered to refer to the ability to respond to adversity with elasticity or flexibility. When used in the field of physics, stress is "strain caused by an external force" and resilience is "the ability to bounce back in the face of strain caused by an external force." The Oxford dictionary definition is as follows: The term ‘resilience’ has been described as springing back, rebounding, returning to original form or position after being bent, readily recovering (The Oxford Modern English Dictionary 1996, p. 864). In the field of psychology, resilience may be interpreted as "recuperative power," "resistance," "restoring force," or "durability." In the field of psychiatry, the concept of resilience is the opposite to that of vulnerability and is used to mean "spontaneous healing power." According to Rutter (1985), resilience is related to the following factors: ‘Firstly, a sense of self-esteem and self-confidence; secondly, a belief in one’s own self-efficacy and ability to deal with change and adaptation; and thirdly, a repertoire of social problem solving approaches.'

Werner conducted a 32-year follow-up survey from 1955 on 698 children on the island of Kauai, Hawaii with risk factors such as poverty or parents with psychiatric disorders. The results indicated that approximately one-third of the children grew into capable and considerate adults, and Werner proposed the concept of resilience as a protective factor supporting growth in spite of adversity. Werner defined resilience as "the ability and psychological characteristics to grow and mature using confrontation with adversity or health disorders as a basis for improving one’s competence." Werner also reported the following protective factors: Three types of protective factors emerged from these analyses of the developmental course of high-risk children: 1) dispositional attributes of the individual, such as activity level and sociability, at least average intelligence, competence in communication skills (language, reading), and an internal locus of control; 2) a tie of affection within the family that provide emotional support in times of stress, whether from a parent, sibling, spouse, or mate; 3) external support systems, whether in school, at work, or church, that reward the individual’s competencies and determination, and provide a belief system by which to live. Another definition is as follows. The term ‘resilience’ is defined as the ability of an individual to bounce back from adversity, persevere through difficult times, and return to a state of internal equilibrium or a state of healthy being (Brodkin & Coleman 1996; Henderson 1998).

In general, mentally vulnerable people with low resilience are said to be subjected to being very moody and to alternate quickly between extremes, such as joy and sorrow. They are only motivated by results, become severely depressed when they fail, and tend to find it difficult to control their emotions. Moreover, when grappling with issues, many such people begin with the assumption that they will not be able to complete the task and tend to have a low self-esteem. In contrast, people who do not give up experience a sense of self-efficacy in which they are able to gradually develop as a person while grappling with issues. They also have an optimistic outlook in the hope that they will be able to achieve success at some stage in the future.

According to Kato et al. (2009), the term resilience contains two major meanings. The first is as a protective or recovery factor and the second is as a dynamic process toward protection and recovery. The concept of resilience as a protective or recovery factor also includes individual characteristics that are composed of biological and personality-related dimensions and population characteristics comprising family and society.
stressful situations and is thought to be similar to the process of stress coping (Lazarus & Folkman, 1984) because it contains different types of perceptions and flexibility in behavior.

The American Psychological Association (APA) (2008) defines resilience as follows: “Resilience is the process of adapting well in the face of adversity, trauma, tragedy, threats or significant sources of stress — such as family and relationship problems, serious health problems or workplace and financial stressors. It means "bouncing back" from difficult experiences”\(^ {19}\).

The APA indicates four components of resilience, stating that several additional factors are associated with resilience, including: 1) The capacity to make realistic plans and take steps to carry them out, 2) A positive view of yourself and confidence in your strengths and abilities, 3) Skills in communication and problem solving, and 4) The capacity to manage strong feelings and impulses.

Thus, the concept of resilience has started to also be applied to education in recent years. In Europe and America, the concept of resilience is already being utilized in actual educational programs. In Japan, however, courses teaching resilience have only begun recently. A survey of high school and college students found no gender difference in resilience. The results indicated that groups with strong resilience had high self-esteem and often took positive actions to combat stress. Groups with weak resilience often acted passively. The report also stated that promotional factors for resilience in high school students included healthy lifestyle habits, such as diet and hours of sleep\(^ {20}\).

**Resilience and occupational stress**

Many studies concerning resilience and occupational stress have targeted nurses as subjects. The nursing practice environment is a special type of work environment in which working hours are long because of shift work and mental and physical tension is high owing to demands of knowledge and skill to assist medical treatment. Additionally, detailed care must be provided to patients and inter-medical team communication ability is required. Therefore, nurses experience strong mental and physical stress, and there is a high job separation rate. The ability of some nurses to deal with stress and exhibit resilience in continuing with their jobs in harsh workplaces, such as this, without burning out has gathered attention and is the reason for their being targeted as subjects for the following studies.

A study of the literature regarding resilience in nurses from 1996 to 2006\(^ {21}\) recommended the following methods to increase personal resilience: ‘Building positive nurturing professional relationships and networks; maintaining positivity; developing emotional insight; achieving life balance and spirituality; and becoming more reflective.’

Thus, in Europe and America, methods of intervention to increase resilience in nurses have been investigated, but in Japan, we have not yet reached the stage of being able to implement such support. Koizumi et al. (2014) have demonstrated a negative correlation between occupational stress reactions and resilience in 225 female nurses. In particular, the fact that nurses in their 20's with less than 5 years of nursing experience, single nurses, and nurses with no strong reason to work exhibited high anxiety, somatic symptoms, and depression scores as stress reactions indicated the necessity of support to increase resilience in the future\(^ {22}\).

Ideas for the construction of a clinical educational system and preceptor system are being investigated to prevent the turnover of newly graduated nurses, who are susceptible to a reality shock. However, we believe that support to increase resilience is needed at an earlier stage for students aiming to become nurses. In fact, there is a tendency in nursing education to give utmost priority to the acquisition of knowledge and skills required to pass the national nursing examination. However, we believe that the four-year training of nurses at universities requires not only the creation of individual values and motivation for nursing but also the implementation of high-quality nursing education that improves the resilience of students to allow them to overcome the harsh clinical environment.

With regard to studies not targeting nurses as subjects, an increasing number of studies have targeted medical staff and public servants working to offer disaster support after the Great East Japan Earthquake. According to Kitamura et al. (2013), it was presumed that the harsh post-disaster environment would be associated with fatigue and psycho-
logical stress but that individual resilience and stress-vulnerable personalities might affect this perception as preventive or risk factors\textsuperscript{23}. However, it appears that there were issues with resilience measurement in this study so the anticipated figures were not obtained. In the future, it appears that the statistical reliability and validity of a major scale that is used to measure resilience need to be confirmed\textsuperscript{24}.

In an intervention study, Steensma \textit{et al}. (2007) administered a resilience training program to 20 subjects with long-term mental health disorders caused by workplace stress or burnout, and the results suggested that subjects used effective coping methods more often after this program and that depression was also reduced\textsuperscript{25}. Fifteen females and 5 males participated in the resilience training program for 24 weeks. The program appeared to have a low reproducibility as it included 9 instruments that interacted in a multiplex manner. In the future, we believe that a comparative study needs to be conducted regarding the measurement of the effects of a program to improve resilience that takes into account factors, such as subject gender, age differences, and protocol uniformity.

The results of the aforementioned studies clarified that future resilience studies will require measurement scales with both higher reliability and validity. Furthermore, the evidence gained from intervention studies needs to be more generalized.

\textbf{Conclusions}

The results regarding the relationship between SOC and lifestyle habits indicated that, in general, people with high SOC do not smoke, engage in regular exercise\textsuperscript{12}, and have a strong subjective state of health, suggesting that they maintain healthier lifestyle habits\textsuperscript{20}. The 3 factors of SOC, mental health, and lifestyle habits interacted.

An investigation of resilience-promoting factors indicated that healthy lifestyle habits, such as a healthy diet and appropriate hours of sleep, were related to resilience\textsuperscript{20}. This suggested that the factors in common with SOC and the similar concept of resilience developed from the aforementioned communication ability to create interpersonal relationships, the ability to skillfully utilize available support resources, and healthy lifestyle habits.

Thus, for support that can improve SOC and resilience to prevent poor mental health, the construction of a program that specifically includes content, such as a cognitive–behavioral approach, improvements in lifestyle habits, the acquisition of communication skills, and the verification of effects of such a program are required.

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