### Part II

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## Research Report from the Department of Preventive Psychiatry

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At the Department of Preventive Psychiatry, we continuously engage in support and research activities that will be of use to disaster survivors as a collaborative space for members of the Tohoku University Department of Psychoneurology and Tohoku University Hospital Department of Psychiatry. In FY 2017, we collaborated with the Miyagi Disaster Mental Health Care Center and affiliated organizations on research activities whose results we report below.

## 1. Research on the Mental Health of Supporters in Disaster-Affected Regions and on Support Methods

#### (1) Problems and Objectives

A great many individuals of different specialties participate in the recovery and reconstruction efforts that take place after a disaster. Previous research that examines the mental health of individuals working in the aftermath of a disaster focused primarily on professional rescue workers who are active in the emergency phase (JSDF troops, firefighters, policemen, etc.). On the other hand, municipal workers, medical officials, social welfare servicemen, educators, and other individuals in public sector jobs play an important role as supporters in the long-term support activities that encompass the recovery and reconstruction processes that take place after the emergency phase. Most of these individuals live in the area affected by the disaster; in addition to the stress the disaster places on their lives, they continue to be exposed to the stress of being involved in post-disaster support work, placing them at high risk for developing mental health problems. However, research on the long-term mental health of these individuals remains insufficient. Thus, starting from the year after the disaster, we administered health surveys to municipal, Social Welfare Council (hereafter, "Welfare Council"), and nursing employees from regions affected by the Great East Japan Earthquake. While providing these individuals with psychiatric support, we have clarified the state of their health and conducted longitudinal research to better help them receive the support they require.

In particular, though we continue receding from the event of the disaster itself, reconstruction work continues. The nature of this work eventually comes to include the resumption of normal work as well, and it changes from year to year. Finally, as supporters from around the country slowly leave, the environment of local supporters is also constantly in flux. In this report, we will use the results of health surveys conducted among welfare council employees and nurses to examine the long-term mental health of supporters who work in disaster-affected regions, determine the factors that contribute to declines in mental health, and consider what sort of policies would be best to protect the mental health of individuals participating in long-term support activities in the recovery and reconstruction periods after the occurrence of a disaster.

#### (2) Research Methods

(1) Health Survey Methods for Welfare Council Members

Our subjects were welfare council members living in disaster-affected coastal regions in the Tohoku area. We conducted surveys of 297 individuals from October 2016 to February 2017

and collected usable data from 287 of them (96.6%) (data analysis took place in FY 2017, and we reported our results to each welfare council between April and June 2017).

Surveys were self-administered. Survey items were as follows: The status of your current work and the extent to which the disaster is affecting you, current health status, a depression/anxiety disorders screening questionnaire (Kessler Psychological Distress Scale: K6), <sup>1-3</sup> evaluation of depressive symptoms and their severity using mental and physical health questionnaire (Patient Health Questionnaire: PHQ-9), <sup>4,5</sup> a three-item easy post-traumatic stress disorder screening test (PTSD-3), <sup>6</sup> and a simple workplace stress assessment <sup>7</sup> related to stress factors at work and social support.

The anonymity of participation was clearly communicated on the question form itself, and to ensure that responses would not be read by workplace superiors or colleagues, they were collected only after they had been sealed in envelopes by participants themselves. As a post-survey consideration, individuals who so desired were given the opportunity to receive counseling from a clinical psychologist or a psychiatric care nurse. This option was available even to individuals who did not submit a questionnaire response. This research was carried out with the approval of the Tohoku Graduate School of Medicine Ethics Review Board.

#### ②Health Survey Methods for Nurses

Our subjects were nurses living in disaster-affected coastal regions in the Tohoku area. Targeting nurses working in hospitals in the coastal areas of Miyagi Prefecture, we provided surveys to 144 participants between February and March 2017. We received 106 back (73.6%) (we carried out data analysis in FY 2017). The subjects of this study had been participating in a longitudinal study beginning in FY 2011.

Surveys were self-administered. Survey items were as follows: Basic attributes (age, sex), your own health and the health of your family, criticism at work, evaluation of depressive symptoms and their severity via a mental/physical health survey (PHQ-9),<sup>4,5</sup> and a PTSD severity evaluation using a 17-item checklist (PTSD Check List: PCL).<sup>8</sup>

Furthermore, this study made secondary use of health surveys carried out in collaboration with hospital organizations in disaster-affected regions. Individuals who indicated on their surveys that they would like in-person meetings and high-risk individuals received follow-up meetings, and to ensure that survivors were not negatively affected by this program, we supplemented our support network before carrying it out. Finally, when collecting and analyzing data, we used concatenably anonymized records. This research was carried out with the approval of the Tohoku Graduate School of Medicine Ethics Review Board.

#### (3) Research Results

①Results of Health Surveys Administered to Welfare Council Employees

We provided surveys to multiple social welfare councils in disaster-affected coastal areas of Miyagi Prefecture. The sex breakdown of respondents was 22.0% male and 77.0% female (1.0% unknown), and their mean age was 48.1 years. The results of our self-administered survey indicated that in FY 2016 health surveys, 11.6% of the people were K6 high-risk, 18.0% were PHQ-9 high-risk, and 6.8% were PTSD-3 high-risk. Changes in high-risk individuals according to K6 and PHQ-9 metrics are shown in Figure 1.

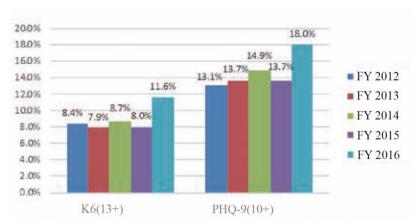


Figure 1: K6 and PHQ-9 High-Risk Individuals in Welfare Councils

Next, to determine the factors related to K6, PHQ-9, and PTSD-3 individuals, we performed a cross-sectional analysis. We carried out a logistic regression with K6, PHQ-9, and PTSD-3 high risk as the objective variable, and basic attributes (age, gender, occupation), personal factors (missing/dead persons in the family, criticism from residents, lack of community solidarity), workplace stress factors (quantitative psychological burden of work, qualitative psychological burden of work, physical burden, degree of control, degree of use of technology, stress of interpersonal relationships, workplace-environment-related stress, degree of aptitude for work, significance of work done, nutrition intake, amount of unpredictable work), and modifying factors (degree of support from one's superiors, degree of support from one's colleagues, degree of support from family/friends, degree of satisfaction with one's life and work) as the explanatory variables. Single regression analysis was carried out for each item, and those that showed significance were grouped together for multiple regression analysis to determine correlations (Table 1).

The factors that correlated with individuals with a K6 score of 13 or higher—individuals aware of their own mental instability—were as follows. "High stress from workplace interpersonal relationships" had the highest odds ratio. People who felt stress in interpersonal relationships were 4.8 times as likely to be aware of their own mental instability as those who did not. Next, people who felt they had "a large amount of unpredictable work" were 4.5 times as likely to be aware of their own mental instability as those who did not.

Table 1: Factors Correlated with the Mental Health of Welfare Council Employees 67–71 Months After the Disaster

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Factors Correlated with Psychological Stress (K6)	High stress in workplace interpersonal relationships Large amount of unpredictable work
Factors Correlated with Depressive Symptoms (PHQ)	Low degree of satisfaction with life/work Large amount of unpredictable work Low age
Factors Correlated with Trauma Symptoms (PTSD-3)	High stress in workplace interpersonal relationships High psychological work burden (qualitative) Criticism from residents caused painful feelings

The factors that correlated with individuals with a PHQ-9 score of 10 or higher—individuals with depressive symptoms who need care—were as follows. "Low degree of satisfaction with life/work" had the highest odds ratio; people with low satisfaction were 12.9 times as likely to show strong depressive symptoms as those without low satisfaction. Next, people with "large amounts of unpredictable work" were 2.9 times as likely as those who did not feel that way to show strong depressive symptoms. Finally, the lower a participant's age, the more likely they were to show strong depressive symptoms; a 10-year increase in a subject's age made them 0.58 times as likely to have depressive symptoms.

The factors that correlated with individuals with PTSD-3 score of 2 or higher—individuals likely to have PTSD—were as follows. "High stress in workplace interpersonal relationships" had the highest odds ratio. People who felt stress in interpersonal relationships were 6.8 times as likely to have PTSD has those who did not. Next, people who had "high psychological work burden (qualitative)" were 5.2 times as likely to have PTSD, and people for whom "criticism from residents caused painful feelings" were 5.0 times as likely to have PTSD.

From the above results, we can see that workplace factors, such as "high stress in workplace interpersonal relationships," "large amount of unpredictable work," and "high psychological work burden (qualitative)" greatly affect mental health. Additionally, the experience of "criticism from residents causing painful feelings" was implied to cause PTSD symptoms.

#### (2) Results of Health Surveys Administered to Nurses

#### a. FY 2016 Cross-Sectional Survey

Of the respondents, 90.2% were women, and their mean age was 41.7 years. When asked about the degree to which they worried about their own health, 28% of respondents answered "almost always" or "frequently." 36% had a family member with some sort of health problem, and 9% had family who required nursing care. 44% needed childcare services. When asked whether they had received criticism from a workplace acquaintance (boss, colleague, staff from another department, etc.) over a work-related matter that had caused them to experience painful feelings, 33% answered that they "certainly had" or "probably had."

The results of the mental/physical health survey polling depression trends (PHQ-9) were as follows. The mean score was 6.3 points and 22.5% of respondents were at high risk of having depressive symptoms (PHQ-9 total score 10+). On the other hand, the mean score for the PCL, which surveys PTSD scores, was 27.0, and 10.4% of respondents were PTSD high-risk individuals (overall PCL score 44+).

#### b. Changes from FY 2011 Survey to FY 2016 Survey

Here, we will report the changes in the responses of our subjects from FY 2011 to FY 2016 and exclude those of the 35 nurses who were newly hired after the observation period began.

First, we will report changes in the results of the mental and physical health questionnaire used to survey depressive symptoms (PHQ-9, Japanese version). According to PHQ-9 results over the years, while the number of high-risk individuals dipped slightly in November 2012, for all other years, more than 20% of individuals polled were high-risk individuals (Figure 2). Furthermore, about half of these high-risk individuals indicated that their depressive symptoms did not affect their daily life. The factors that correlated with high-risk individuals were the following. Private factors: "family members needing nursing care" and "family members with health problems." Workplace factors: "Criticism at work caused painful feelings," "does not feel their work has any point to it," "lack of aptitude for their work," and "low satisfaction with work."

The changes in the results of the PCL survey, which indicates PTSD symptoms, show that until the end of 2014, mean scores dropped, but that downward trend stopped there. Even six years after the disaster, slightly less than 10% of individuals at high-risk for PTSD remain in the community (Figure 3). With regard to these high-risk individuals, nearly all of them responded that their PTSD symptoms made it "somewhat difficult" to go about their daily lives. Before the disaster, almost none of these individuals had received any kind of treatment for mental instability, but following the disaster, half of them ended up having to opt for that sort of treatment (the other half are as yet untreated). Finally, although the trend was weaker than that of "family members needing nursing care," individuals with personal health problems were also present to a large degree among the PTSD high-risk individuals.

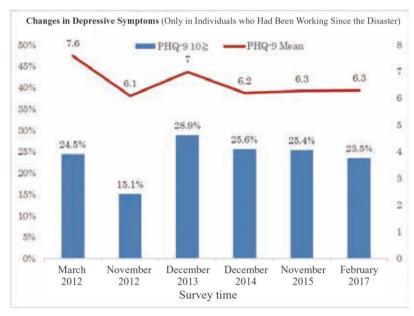


Figure 2: Changes in Trends in Depression among Nurses in the Disaster-Affected Region

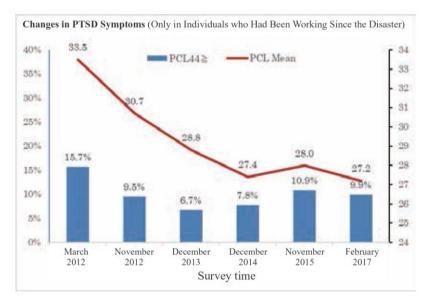


Figure 3: Changes in Trends in PTSD among Nurses in the Disaster-Affected Region

#### (4) Discussion

#### (1) Discussion of Health Survey for Welfare Council Workers

If we chronologically compare the results of this past health survey for welfare council workers with those of the cross-sectional survey that measured results from FY 2012 to FY 2015, we see that K6 high-risk individuals changed thus:  $8.4\% \rightarrow 7.9\% \rightarrow 8.7\% \rightarrow 8.0\% \rightarrow$ 11.6%; their number rose this past year. Furthermore, for some time now, this percentage has been higher than the pre-disaster average across all of Miyagi Prefecture (~6%, according to the 2010 National Census). PHQ-9 high-risk individuals changed thus:  $13.1\% \rightarrow 13.7\% \rightarrow 14.9\%$  $\rightarrow$  13.7%  $\rightarrow$  18.0%. For the evaluation of the severity of PTSD symptoms, we used the PTSD (PCL) until FY 2015, and PCL high-risk patients changed  $4.1\% \rightarrow 4.1\% \rightarrow 3.7\% \rightarrow 3.3$ . However, for this past survey, we used the PTSD-3 survey. These results indicated a slight increase in high-risk individuals, at 6.8%. However, the PCL and the PTSD-3 surveys are different scales, and their results cannot be so easily compared.

Six years have passed since the disaster. This year, measures of mental instability that had remained constant since the occurrence of the disaster rose. Psychological stress and depression develop and perhaps even worsen as reconstruction and support grow more and more long-term, whereas PTSD improvement appears to have reached its peak. Because the welfare councils that participated in this research changed from year to year, we cannot so easily compare our results. However, the councils that participated in this year's research were all cities and towns in coastal regions, where the impact of the disaster was particularly severe. In these areas, even after six years have passed, it is likely that chronic stress situations greatly affect the mental health of employees and workers.

After considering the factors that influence mental health 67 months after the disaster, we found the following. In addition to workplace factors like "high stress in workplace interpersonal relationships," "large amount of unpredictable work," and "high psychological work burden (qualitative)," employment factors, including "low satisfaction with work and life," were also found to negatively influence mental health. In particular, high stress in workplace interpersonal relationships and large amounts of unpredictable work were found to be risk factors influencing the worsening of various kinds of mental health. In order to maintain employee mental health, problems in workplace communication should be highlighted and efforts to fix them should be undertaken. Additionally, some degree of ingenuity should be used to make work more predictable and attention should be paid to lightening not only the quantitative but also the qualitative burden of work issued. In any case, we believe that efforts throughout the workplace to better the working environment are essential. In addition to work related to reconstruction, peacetime work to support the welfare of the region is gradually returning to normal. Thus, rather than devising mental health policies specialized for disaster reconstruction, workplace-wide initiatives to improve working environment are necessary.

Finally, with regard to PTSD symptoms, the factor of "experiencing painful feelings after receiving criticism from a resident following the disaster" was also found to be correlated. An organizational structure that enables discussion of the labors of interpersonal support ought to be formulated or allowances for work-related conferences or supervision may be effective policies to enact as we transition from the disaster reconstruction period to peacetime workplace mental health policies.

#### (2) Discussion of Health Survey for Nurses

Now, approximately six years after the disaster, a stable number of PTSD high-risk individuals exist—as they have for some time—in the community. While the mean score of the "trauma symptoms" group has decreased, very little change has been observed in the number of PTSD high-risk individuals. We believe this is because there are cases were individuals have comparatively serious symptoms which have now become chronic. While this survey did not evaluate the degree to which daily life has become difficult for respondents, we worry that at least some high-risk individuals are experiencing difficulty in their daily lives as a result of these symptoms. About half of these high-risk individuals have at some point been seen by medical personnel, but the other half have not. The sorts of measures that are being taken to address trauma symptoms in these individuals, as well as whether or not the untreated individuals really do not require any sort of treatment at all are both points which give cause for worry. As a workplace organization, we should keep the possibility of situations like this arising among our employees at the front of our mind, and we should strive to create an organizational structure that allows us to address them should they indeed arise.

With regard to depressive symptoms, it is important that we recognize that approximately 20% of all workers are working with symptoms severe enough to interfere with their daily lives. In addition, based on the fact that home-life factors like "family members needing nursing care" and "family members with health problems" were also implicated, it is important that individuals in this sort of situation be afforded some degree of consideration. "Criticism in the workplace leading to painful feelings" was another factor that was correlated, meaning that anti-harassment policies and the improvement of communication/collaboration should be continuously developed and implemented. "Does not feel work has any point to it," "lack of

aptitude for work," and "low satisfaction with work" were also correlated factors. For these, managers should periodically interview staff and be sure not to let individuals with negative opinions about their work go unheard. They should be followed up with afterwards as well.

# 2. Research on Psychological Support Methods in Disaster-Affected Regions: Research on the Spreading During Disaster Reconstruction of a Psychological Support Method, the Skills for Psychological Recovery (SPR) Protocol, and the Development of a DVD for Supporter Skill Improvement

#### (1) Problems and Objectives

SPR is a practical psychological support method that can be widely applied to the sorts of mental problems survivors are likely to face during the recovery/reconstruction phases following a disaster. It was developed by the American National PTSD Center and the American National Child Traumatic Stress Network and released in 2010. In June 2011, the Hyogo Prefecture Disaster Mental Health Care Center Research Team developed a Japanese version. It is a very new psychological support method. Following the Great East Japan Earthquake, we educated specialists in Miyagi Prefecture by conducting a training session for specialists in disaster-affected regions aimed at spreading and improving one's skill at SPR. We also undertook a research effort in regions affected by the Great East Japan Earthquake designed to provide SPT to residents and determine whether or not the technique can be used throughout Japan.

In the SPR spreading and skill-improvement training sessions held for mental health care specialists working in support in areas affected by the Great East Japan Earthquake, basic training workshops 2–3 days in length were held a total of five times in disaster-affected regions between June 2012 and July 2014, and a total of 151 individuals participated. After this, follow-up training sessions for individuals who requested them were held in disaster-affected regions a total of four times between November 2012 and October 2014, which a total of 56 people attended.

As a result, the degree of participant satisfaction with training protocols and interest in the SPR program was high, but we found that confidence in participants' ability to successfully use SPR was low. Additionally, while participants believed to some extent that SPR could be used in a variety of situations, including outreach activities or visitations, there were outstanding issues related to interview techniques to be resolved in order for it to be actually used. Finally, we found that participants desired modeling, roleplay, case studies, and supervision as they attempted to learn and implement this new technique. From these findings, we realized that in order to raise public awareness about this support method, we needed to develop a tool that could provide some sort of modeling-like function.

Thus, for this research, we produced a DVD to serve as a modeling tool that would help achieve skill improvement in SPR among supporters, and thereby increase their ability to implement the SPR technique, a psychological support method recommended for use during disaster reconstruction. We decided to conduct research whose objective would be monitoring the effect that using this DVD would have.

#### (2) Research Methods

#### (1)Outline of Produced DVD

#### a. DVD Usage and Expected Effect

We would provide the DVD to participants at SPR training sessions in Japan as a supplemental teaching material and ask them to use it. We expected that the DVD would increase the learning ability of future students of the SPR method, as well as provide an opportunity for those who had already learned it to brush up on their skills. In addition, we believe this research effort will both enable large-scale validation research on the effects of SPR and promote the idea of psychological support during disaster reconstruction.

#### b. DVD Contents

We decided that in order to ensure the DVD would improve the usability of SPR, we would focus on the inclusion of demonstrations (roleplay) for each SPR skill. In order to ensure that this DVD would be of particular use to public health nurses, psychiatric social

workers, and psychologists as they engage in outreach or visitations, the scenes included involve support staff visiting patients in temporary housing.

#### c. DVD Structure

We decided that playback time would be between 90–120 minutes, and the DVD would be separated into chapters, enabling viewers to see only the sections they want to. The chapter list is given below.

- 1. About SPR and the structure of the DVD
- 2. Gathering information and prioritizing support
- 3. Carrying out positive actions
- 4. Dealing with mental and physical reactions
- 5. Holding useful perspectives
- 6. Building good relationships with the people around you
- 7. Continuous interview
- 8. Production collaborators, etc.

#### d. Contents of Fictional Case

We collaborated with public health nurses from disaster affected areas on the content of the fictional case featured on the DVD. We designed a case that would allow us to make use of all SPR skills. Finally, we received guidance from a clinical psychologist and a qualified SPR trainer, Tomoko Ohsawa of the Hyogo Prefecture Disaster Mental Health Care Center.



Figure 4: SPR DVD Package



Figure 5: SPR DVD Introduction

#### (2)Methods

#### a. Subjects

Specialists who had participated in the SPR training sessions and worked in mental health care in disaster-affected regions.

#### b. Survey Methods

We sent the SPR demonstration DVD, research objective description, the survey, and a return envelope to the address given by SPR training session participants when they registered.

#### c. Survey Contents

We surveyed subject attributes (sex, age, occupation), opinions on the DVD (satisfaction, understandability, usability, chapter length, understandability of each skill), understanding and awareness of SPR (relatedness of their work and SPR, desire to use SPR, confidence in ability to use SPR, usefulness of each skill), and requested participants to provide us with their opinions and thoughts via free response.

#### (3) Research Results

#### 1)DVD Production

We shot footage for the DVD on October 14–15 and November 19, 2017, and the DVD was produced soon after. It was then sent to SPR training session participants, and we asked them to use it to further their learning.

#### 2 Survey Results

We received survey responses from 13 specialists who used the DVD. Subjects were in their 20s to their 60s, and 53.8% were female. Their occupations were as follows: nurse, clinical psychologist, psychiatric social

worker, psychiatrist, and public health nurse (Table 2).

**Table 2: Survey Subject Attributes** 

20s	1 subject
30s	4 subjects
40s	6 subjects
50s	2 subjects
Male	6 subjects
Female	7 subjects
Clinical psychologist	3 subjects
Psychiatric social worker	2 subjects
Psychiatrist	2 subjects
Public health nurse	1 subject
Nurse	5 subjects
	30s 40s 50s  Male Female  Clinical psychologist Psychiatric social worker Psychiatrist Public health nurse

#### (3)Opinions on the DVD

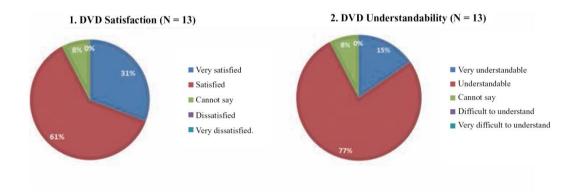
From our survey polling opinions on the DVD, we found that user satisfaction with and understandability were both greater than 90%, a very positive opinion. Usability was ~85%, a positive opinion. Approximately 40% of respondents found each chapter to be just the right length; the remaining 60% found them to be either slightly too long or too long.

As for the understandability of each skill, save "Holding useful perspectives," approximately 85% of respondents found the understandability to be good. On the other hand, approximately 15% of respondents found the "Holding useful perspectives" chapter to be difficult to understand (Figure 6).

#### (4)Understanding and Awareness of SPR (Figure 7)

As for the relatedness of participant work and SPR, approximately 70% of participants felt SPR was related to their current work. Approximately 70% also felt that they would like to try using SPR in their practice. On the other hand, only 30% of participants felt confident in their ability to use SPR.

As for skill usability, all skills were deemed useful by at least 70% of respondents. Among these, "positive actions" was found to be useful by 85% of respondents, indicating that it may be an easily implemented skill.



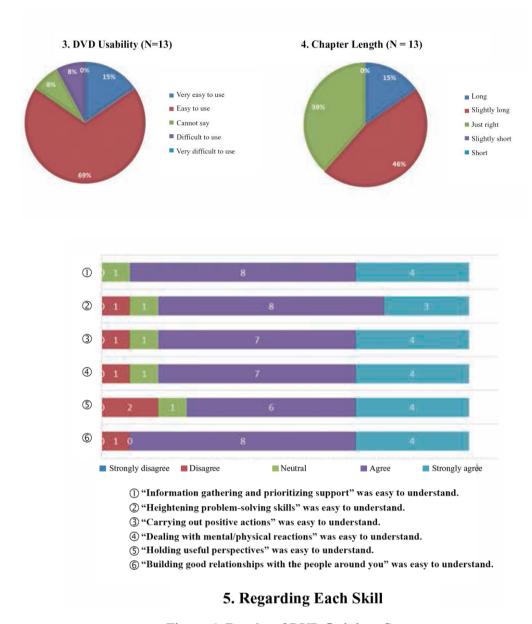


Figure 6: Results of DVD Opinions Survey

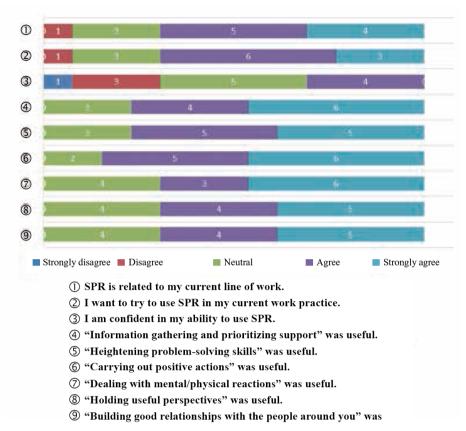


Figure 7: Results of Survey on SPR Understanding and Awareness

#### (4) Discussion

The objective of this research was to produce a DVD to serve as an SPR instructional aid and to examine its effects. For this DVD aid, we designed a fictional case involving a visitation to temporary housing wherein the use of all SPR skills could be demonstrated. As for the appropriateness of our fictional case, in the free response section of our survey, we received the following comment: "The visitation scene felt very real, and I thought 'This is just like how it feels in real life!' while watching." We therefore believe the DVD was an appropriate aid.

The understandability and usability of the DVD were both high, and learners reported high satisfaction with it. The free-response comments we received were quite positive and included the following: "I thought it was constructed in a very easy-to-understand manner," and "Watching the DVD made things much clearer." Additionally, someone said, "I wasn't able to follow along with the roleplay demonstration given at the training session, but the content of the DVD made it easy for me to supplement and confirm my understanding." It is therefore possible that the DVD helped supplement the lecture and the roleplay activities used therein.

However, many respondents indicated that they felt that chapters were either "slightly long" or simply "long," indicating that time-based restraints on video viewing can become a burden for learners. With regard to this point, this study included only individuals who had already participated in at least one SPR training session, meaning that it was quite likely that the content on the DVD repeated learning material presented during a lecture or roleplay session. This may have led users of the DVD to feel that some of the chapters were long. Consequently, individuals learning SPR for the first time may have a different impression of chapter length. In addition, we received the following positive comments with regard to length: "It felt long, but it had a lot of useful, important information like how to ask questions or how to offer advice. Specifically

speaking, then, it was long, but worthwhile." Thus, it is quite possible that length, content richness, and degree of satisfaction are related.

With regard to the understandability of each skill, nearly every skill received positive feedback, but some individuals found the "Holding useful perspectives" skill difficult to understand. This is because the cognitive reconstruction method is one of the more difficult cognitive behavioral skills. With regard to confidence in using SPR, only 30% of respondents felt confident in using the technique. We believe this to be one of the barriers preventing use of learned skills in the field. We believe a desirable way to address skill acquisition, application to cases, and confidence in SPR use would be to have users implement the technique on individual cases with supervision and slowly build up their proficiency. When beginning learners use SPR in a real situation, consideration should be paid to the fact that time and repetitions are now limited and supervision can help lessen the anxiety and bewilderment they may feel regarding which skill is most appropriate, etc. Because respondents indicated that all skills were useful, we believe that supervised practice of the material presented in the DVD can help improve confidence and proficiency with SPR skills.

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