

Original Article

Comparison of resilience level among occupations and the relationship between resilience and relaxation in our recovery rehabilitation ward: a pilot study

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Abstract

Objective: The purpose of this study was to compare resilience among the occupations involved in a recovery rehabilitation ward of a hospital and to clarify the relationship between resilience and relaxation.

Subjects and Methods: A total of 133 subjects (56 in the rehabilitation department, 43 in the nursing department, and 34 in the care worker department) of physical therapists, occupational therapists, and speech-language-hearing therapists were surveyed using the Adolescent Resilience Scale (ARS) and a short-form self-report measure to assess relaxation effects (S-MARE).

Results: It was found that resilience was lower in the nursing department than in the rehabilitation and care worker department. Resilience was also found to be related to relaxation.

Conclusions: Many previous studies have reported the issue of stress in nursing. The low resilience in nursing departments may be a result of high stress among nurses, and a harsh working environment. Therefore, it is necessary to consider ways to reduce stress among nurses. On the other hand, the results of this study showed a relationship between resilience and relaxation. This result is considered to be useful data to verify the effects of relaxation in enhancing resilience in a nursing department of a hospital.

Keywords: Resilience, Relaxation, Stress, Resilience differences among departments

Introduction

At the hospital, a recovery rehabilitation ward is required to provide specialized care and team approaches by various professions for the early discharge of patients from the hospital. In order to provide high-quality rehabilitation, it is necessary to train staff based on individual skill development and career advancement and to collaborate with multiple professions.

However, according to Imai (2011) and Nakano (2019), there are chronic labor shortages in various nursing and elderly care fields. One of the causes of this is the harsh working conditions and working environment, which is claimed to be a cause of burnout and turnover in many nursing and elderly care facilities (Ramalisa,

2018). This is presumed that it could be a major detriment to strengthening multidisciplinary collaboration.

In response to these problems, previous studies have shown the significance of resilience in coping with individual difficulties, and complex situations (Ramalisa, 2018; Oginska, 2020; Emilie, 2019). According to Oshio (2002), psychological resilience refers to the ability to bounce back from a depressive state. Even after experiencing various stresses and negative events, people can recover to a good psychological and social state by increasing their resilience (Figure 1). Furthermore, Murden (2018) and Sekimoto (2013) concluded that resilience was an important factor not only in

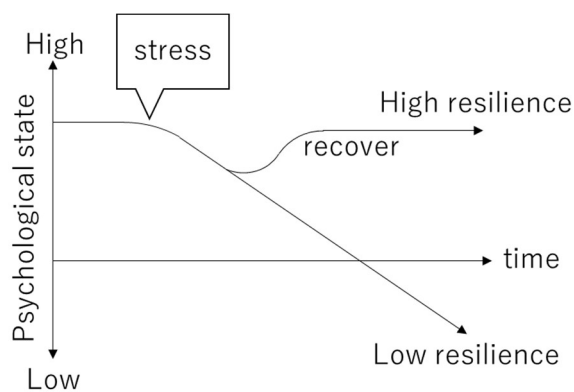


Figure 1: Image of resilience shown by this study

In modern society, individuals experience stress and negative life events caused by various events that affect their mental health. However, even in these situations, resilience enables individuals to recover from psychological depression caused by various difficulties (Oshio, 2002).

preventing burnout and turnover but also in strengthening collaboration with multiple professions and providing quality services to patients. This indicates that enhancing the resilience to cope with stress may make a certain contribution to the improvement of the team approach at hospitals in the future. In fact, numerous previous studies have shown a relationship between resilience and stress. It has been reported that resilience, a psycho-educational variable, is linearly related to stress coping in the academic performance of medical students (Banerjee, 2019) and that adverse physiological changes induced by stress are factors that cause a decrease in resilience (Park, 2013). It has also been reported that the introduction of mindfulness as part of stress coping training led to enhanced resilience (Denkova, 2020; Hwang, 2018; Kemper, 2015). Mindfulness is paying attention to what one feels as it is, rather than analyzing any value or adding judgment to the experience of here and now. It is a method developed by the Eastern practice of Zen meditation, which is used as a meditation program for stress reduction (Hirao,

2013). Park (2013), on the other hand, reviewed previous studies that produced various relaxation effects and noted that the introduction of relaxation programs for patients with chronic stress may contribute to the improvement of resilience. Relaxation is a counterpart to physiological changes caused by stress and has the characteristic of working on the tense state of mind and body and changing the balance of mind and body to a desirable state (Nakakita, 2010; Park, 2013). In other words, relaxation, which is the opposite of stress, is deeply related to resilience. However, there are few reports showing the relationship between resilience and relaxation. The aforementioned report by Park (2013), which describes the effects of a relaxation program focused on chronically stressed patients, shows that various relaxation methods are effective as indicators of anxiety and stress, but does not present a linear relationship between resilience and relaxation. Nevertheless, relaxation has been shown to reduce stress, suggesting that relaxation may make a certain contribution to resilience.

As it is indicated above, it is worthwhile to presume that clarifying the resilience of the staff in a rehabilitation ward will help to understand the stress and work content in relation to the duties of each job category. Furthermore, if the correlation between resilience and relaxation is clarified, it is expected to provide clues for finding the state of resilience and coping methods for staff in the future. Therefore, this research is designed to clarify whether resilience differs by job type and to find if any relationship between resilience and relaxation among the hospital staff will be found.

Subjects and Methods

1. Subjects

The subjects in this study were the staff at a rehabilitation department including physical therapists, occupational therapists, and speech-

language-hearing therapists. The department is hereafter referred to as "the rehabilitation department". Furthermore, staff in a nursing department, and an elderly care department in the recovery rehabilitation ward of this hospital were taken as subjects for this study.

2. Survey method

This study was conducted via the Internet, and Forms of Office365 was used. The "Required" function included in Forms was used to avoid any responses to be missed. The subjects were asked to read a document that included a description of the study, a QR code that was linked to the survey items, and the time required to respond (approximately 5 to 8 minutes), and only those who agreed to join the survey were proceeded to answer the questions. The survey was distributed to staff members in charge of the rehabilitation, nursing, and care worker departments. The survey was administered during the lunch break designated for each job category. The survey period was from September 1, 2019, to September 14, 2019. Approval to conduct this study was obtained from the research ethics committee of the relevant institution (date of approval: August 14, 2019).

3. Study 1: Study on the introduction of the Adolescent Resilience Scale (ARS)

In introducing a resilience scale at a hospital, the ARS developed by Oshio (2002) was chosen, considering that it was free of charge and that it was designed not to cast too much burden on the subjects. This Scale consists of 21 items with five items (5 for completely agree, 4 for somewhat agree, 3 for neither agree nor disagree, 2 for somewhat disagree and 1 for completely disagree). The scale comes with three subscales: novelty seeking, emotion regulation, and positive future orientation. The validity and reliability of this Scale have already been

verified (Oshio, 2002). However, this Scale was focused on adolescents, and the subjects of this Scale were university students when it was developed. The target population of this study was employees working in a convalescent care unit with a relatively wide age range. Therefore, Study 1 was conducted to verify the factor loadings, reliability coefficients, and inter-factor correlations of the 21 items by confirmatory factor analysis to determine that it would be reliable to introduce the ARS in the institution.

4. Study 2: Introduction of a relaxation scale and examination of the relationship between relaxation and resilience

Next, it was examined whether the ARS validated in Study 1 was related to relaxation. The short-form self-report measure to assess relaxation effects (S-MARE) was used as a relaxation scale. S-MARE is one of the psychological relaxation indices and consists of five items each for physiological tension, psychological rest, and cognitive anxiety, for a total of 15 items, and is designed to be less burdensome for subjects (Sakakibara, 2014). This scale has five items (5 for completely agree, 4 for somewhat agree, 3 for neither agree nor disagree, 2 for somewhat disagree, and 1 for completely disagree), and a higher score indicates a better state of psychological relaxation. Approval for use of this Scale was obtained from the authors and the Japanese Psychological Association (approval date: August 27, 2019, from the authors and August 28, 2019, from the Japanese Psychological Association).

5. Study 3: Resilience of the hospital staff and differences between jobs

The ARS used in Study 1 was administered to assess resilience among occupations. We compared three groups (rehabilitation, nursing, and care worker) to examine whether there were differences in the three ARS subscales and total

Resilience scores among occupations. In addition, to clarify whether the differences in the three ARS subscales and total resilience scores were due to basic attributes, we compared the differences in basic attributes among the three job groups.

The basic attributes of the subjects were based on the report of Nonaka (2008), who conducted a stress survey on a scale equivalent to that of this study. The age was defined as 20-29 years, 30-39 years, 40-49 years, and 50-59 years, the years of experience as 1-5 years, 5-11 years, and 11 or more years, and gender was defined as male and female.

6. Statistical analysis

In order to compare the basic attributes covered in this study across occupations, χ^2 independent tests were performed for age comparison, years of experience, and gender.

Factor analysis was conducted on 21 items of the ARS. Various ways of perceiving the value of the factor loadings have been cited, such as 0.3, 0.35, and 0.4 or higher (Harada, 2008). This study referred to the analysis methods of Harada (2014), Machida (2019), and Miyahara (2007), and excluded items with factor loadings of less than 0.35. Cronbach's alpha coefficient was used to verify the reliability of each subitem. Items that had a Floor effect and a Ceiling effect were excluded.

Spearman's rank correlation coefficient was used to examine the association between the ARS subscales and total resilience scores and relaxation.

The Kruskal-Wallis test was used for comparison of the ARS subscales and total Resilience scores between occupations, and the Bonferroni correction was used for multiple comparisons when significant differences were found. When significant differences were found between occupations in the ARS subscales and total Resilience scores, comparisons were made

based on the basic attributes of each occupation. Resilience by age and years of experience were compared using the Kruskal-Wallis test, with Bonferroni correction for multiple comparisons when significant differences were found. Resilience by gender was compared using the Mann-Whitney U test.

The significance level for all tests was set at 5%, and HAD, Ver 16.0 (Shimizu, 2016) was used for statistical analysis.

Results

As a result of this study, 133 responses were obtained, 56 from the rehabilitation department, 43 from the nursing department, and 34 from the care worker department; all 133 responses were valid.

Table 1 shows the results of basic attributes by job category. Items that showed statistically significant differences were age 20-29, years of experience 5-10, and gender male/female. In the age 20-29 category, 67.5% of all occupations were in the rehabilitation department. In the 5-10 year experience category, 50.0% of all occupations were in the rehabilitation department. Both were higher in the rehabilitation department than in the nursing and care worker departments. The male respondents in the nursing department accounted for 10.4% of all occupations, while the female respondents in the nursing department accounted for 54.5% of all occupations.

1. Results of study 1

Table 2 shows the results of confirmatory factor analysis on the ARS. All items examined showed high factor loadings. Cronbach's alpha, which indicates good internal consistency, was also high at 0.864, 0.718, and 0.853. The mean \pm standard deviation was neither less than the minimum value (1) nor greater than the maximum value (5) for all items, indicating that none of the items showed a Floor effect or a

Table 1: Basic attributes of each occupation

Attribute		A (%) n=56	B (%) n=43	C (%) n=34	Total n=133	p-value
Age	20-29	27 (67.5)	12 (30.0)	1 (2.5)	40	**
	30-39	23 (46.0)	13 (26.0)	14 (28.0)	50	n.s
	40-49	6 (18.8)	14 (43.8)	12 (37.5)	32	n.s
	50-59	0 (0.0)	4 (36.4)	7 (63.6)	11	n.s
Years of experience	1-4	19 (40.4)	13 (27.7)	15 (31.9)	53	n.s
	5-10	25 (50.0)	13 (26.0)	12 (24.0)	44	*
	over 11	12 (33.3)	17 (47.2)	7 (19.4)	36	n.s
Gender	Male	35 (52.2)	7 (10.4)	25 (37.3)	51	**
	Female	21 (31.8)	36 (54.5)	9 (13.6)	82	**

Independent test of χ^2 ** $p < .01$, * $p < .05$, n.s: not significant (comparing rehabilitation, nursing, and care worker departments at each level), A: Rehabilitation department, B: Nursing department, C: Care worker department

Percentage (compare the sum of the rehabilitation, nursing, and care worker department as 100% for each tier)

Table 2: Factor analysis subitem extraction and results of factor loadings and confidence

Item	Factor1	Factor2	Factor3	Cronbach α	Mean	SD
I seek new challenges	.840	.000	.000	.864	3.34	1.01
I like new or intriguing things	.809	.000	.000		3.60	0.96
I think I have a high level of interest and curiosity	.803	.000	.000		3.31	1.05
I like to find out about things	.864	.000	.000		3.79	0.87
I think difficulties form a part of life's valuable experiences	.795	.000	.000		3.74	0.96
I don't like to do unfamiliar things	.821	.000	.000		2.52	0.91
I find it bothersome to start new activities	.817	.000	.000		3.60	0.96
I think I can control my emotions	.000	.831	.000	.718	3.23	0.93
I can stay calm in tough circumstances	.000	.817	.000		3.13	0.97
I make an effort to always stay calm	.000	.845	.000		3.83	0.79
I think I have perseverance	.000	.787	.000		3.41	0.99
I find it difficult not to dwell on negative experience	.000	.616	.000		2.75	1.08
I cannot endure adversity	.000	.769	.000		3.14	0.94
My behavior varies with my daily moods	.000	.760	.000		2.86	1.04
I lose interest quickly	.000	.749	.000		2.78	0.97
I have difficulty in controlling my anger	.000	.765	.000		3.47	0.96
I am sure that good things will happen in the future	.000	.000	.837	.853	3.35	1.06
I think I have a bright future	.000	.000	.831		3.06	1.05
I feel positive about my future	.000	.000	.839		3.20	1.10
I have a clear goal for the future	.000	.000	.786		3.36	1.08
I am striving towards my future goal	.000	.000	.806		3.30	0.88

Factor1: Novelty Seeking, Factor2: Emotional Regulation, Factor3: Positive Future Orientation

SD: Standard Deviation

Table 3: Results of inter-factor correlations

	Novelty Seeking	Emotional Regulation	Positive Future Orientation
Novelty Seeking	1.000		
Emotional Regulation	.611	1.000	
Positive Future Orientation	.798	.757	1.000

Ceiling effect. In addition, correlations between factors were found for each sub-item (Table 3). Therefore, all 21 items of the ARS were used in this study.

2. Results of study 2

The correlation coefficients between the three subscales of the ARS, total Resilience scores, and S-MARE were determined, and significant correlations were found for each sub-item, total Resilience scores, and S-MARE (Table 4).

3. Results of study 3

The results of Study 3 are presented in Table 5. A Kruskal-Wallis test was used to compare the ARS subscales and total Resilience scores across occupations. The results showed significant differences ($p < .05$) in total emotion regulation and total psychological resilience. No significant differences were found between novelty seeking and positive future orientation. Next, Bonferroni's correction was used to compare the results of emotion regulation and total resilience scores across occupational categories. The difference of emotion regulation was significantly greater between rehabilitation and

nursing ($p < .05$, $r = 0.23$) and between nursing and care worker ($p < .01$, $r = 0.26$). The care worker department had the highest scores and the nursing department had the lowest. There were no significant differences between the rehabilitation and the nursing department. The total resilience scores were significantly different between the nursing and the care worker ($p < .05$, $r = 0.23$), indicating lower resilience in the nursing department. No significant differences were found between the rehabilitation and the nursing department, and between the rehabilitation and the care worker departments. This indicated that the nursing department had the lowest resilience in this facility.

Next, each of the three subscales of the ARS and the total Resilience scores was compared according to the basic attributes of each profession. The results showed no significant differences by age, years of experience, or gender among the rehabilitation, nursing, and the care worker department. The results indicated that the differences in resilience among the rehabilitation, the nursing, and the care worker department were not influenced by the basic attributes, but it was presumed that it would be by the occupational differences.

Table 4: Rank correlation coefficients for each

	1) Positive Future Orientation	2) Novelty Seeking	3) Emotional Regulation	4) ARS total score	5) S-MARE
1) Positive Future Orientation	1.000				
2) Novelty Seeking	.488 **	1.000			
3) Emotional Regulation	.392 **	.204 *	1.000		
4) ARS total score	.798 **	.728 **	.705 **	1.000	
5) S-MARE	.491 **	.271 **	.421 **	.495 **	1.000

Spearman's rank correlation coefficient ** $p < .01$, * $p < .05$

Table 5: Comparison of resilience across occupations

Attribute	A (<i>n</i> =56)		B (<i>n</i> =43)		C (<i>n</i> =34)		<i>p</i> -value
	Median	(Min~Max)	Median	(Min~Max)	Median	(Min~Max)	
Novelty Seeking	24.0	(8.0~33.0)	22.0	(11.0~31.0)	24.0	(13.0~30.0)	n.s
Emotional Regulation	28.0	(17.0~37.0)	28.0	(16.0~37.0)	32.0	(19.0~39.0)	A-C* B-C**
Positive Future Orientation	17.0	(6.0~25.0)	15.0	(6.0~21.0)	16.5	(6.0~23.0)	n.s
ARS total score	69.5	(31.0~92.0)	66.0	(43.0~80.0)	72.0	(50.0~87.0)	B-C*

Bonferroni correction ** $p < .01$, * $p < .05$ n.s. : not significant, A: Rehabilitation department, B: Nursing department, C: Care worker department

Total score

Novelty seeking (7 items): 35 points

Emotion regulation (9 items): 45 points

Positive future orientation (5 items): 25 points

ARS total scores (21 items): 105 points

Discussion

1. About study 1

This study attempted to introduce the ARS developed by Oshio (2002) in order to understand the resilience of the staff working in the Rehabilitation Ward of the hospital. However, the ARS was developed mainly for university students, and most of the subjects in this study were staff members engaged in recovery rehabilitation who was in the middle to late middle age group. In this study, confirmatory factor analysis was conducted on the ARS to examine factor loadings, reliability coefficients, and correlations between factors. The results showed that both factor loadings and reliability coefficients were high. In terms of inter-factor correlations, correlations were found for all the subscales. Therefore, it was decided to adopt the ARS for the hospital staff in this study.

Wakasaki (2016) analyzed factors related to resilience and quality of life (QOL) in adult breast cancer patients with an average age of 51 years who were not university students. They concluded that resilience varies depending on

the disease progression and socioeconomic status of the breast cancer patients and that this factor represents the quality of life of breast cancer patients. This study indicates that the ARS developed by Oshio (2002) may be applicable as a resilience scale to a wide range of age groups and people with various diseases. However, the attributes of the subjects validated in this study and those validated by Wakasaki (2016) were different, and these results alone do not allow us to conclude that the ARS can be used for all subjects who fall into the middle to late middle age range. Hotta (2012) is cautious about the use of various resilience scales developed to date, pointing out that there is a wide range of resilience constructs and thus there are too many differences among these scales. On the other hand, the ARS used in this study has been shown to be related to relaxation and quality of life in addition to stress in previous studies and is a useful scale that can be used in various fields. In the future, it is necessary to further examine the possibility of applying the ARS after a detailed classification

and analysis of the target attributes being conducted.

2. About study 2

The correlation coefficients between the three subscales of the ARS, total Resilience scores, and S-MARE were examined, and significant correlations were found between each subscale, total Resilience scores, and S-MARE. Thus, the relationship between resilience and relaxation was statistically supported. This result supports Park's (2013) theory that the relaxation effect reduces stress and consequently increases resilience. In other words, the role of relaxation as an opposite response to stress that affects resilience was inferred to underlie the results of this study. Sakakibara (2014) conducted an autonomic nerve system training method using subjective relaxation to test the validity of S-MARE and found that the autonomic nervous system (ANS) training method produced changes in S-MARE indicating relaxation effects. In addition to these ANS training methods, relaxation methods include breathing and progressive muscle relaxation are used in a variety of settings (Park, 2013). These methods do not require a specific time or place for implementation, and they do not depend on the workplace environment. They are easy to introduce on a regular basis. Furthermore, S-MARE has a clear three-factor structure (physiological tension, psychological rest, and cognitive anxiety) and a small number of questions. This means that the S-MARE can be introduced as a scale that is less burdensome for the hospital staff and it will be useful to use S-MARE to analyze problems.

In conclusion, the results of this study suggest that relaxation surveys can be easily introduced in a hospital and can serve as a means of improving resilience.

3. About study 3

Using the ARS, the resilience of rehabilitation, the nursing, and the care worker department staff were compared in order to examine differences in resilience levels among different occupational groups. The results revealed that the nursing department had lower emotional regulation and total Resilience scores than those of the rehabilitation and the care worker departments. Although there were no statistically significant differences in novelty seeking and positive future orientation among the professions, the median values were the lowest in nursing. There were more women in the nursing department than in the rehabilitation and care worker departments. It was necessary to verify if gender was the only reason which resulted in low resilience scores in the nursing department. The differences in basic attributes for each occupational category were examined and comparisons were made by age, years of experience, and gender. The results showed that all three subscales and the total Resilience scores obtained in this study did not differ significantly by basic attributes. In other words, low resilience in the nursing department was not influenced by gender but may be due to the characteristics of the nursing profession. In fact, a number of studies on stress and nurses which were related to resilience levels have been reported (Khamisa, 2015; Nowrouzi, 2015; Pamela, 2018). Although it is not clear whether these reports directly indicate low resilience among nurses, the findings of this study suggest that working conditions in the nursing department may have an impact on resilience. Kashima (2016) has identified the importance of improving and enhancing the work environment for nurses. Kashima (2016) analyzed the criteria of "comfort at the working place" perceived by nurses working in hospitals and claimed that it would be very important to create a comfortable workplace for nurses. According to this analysis,

39 categories were formed as criteria that determine the "comfort at the working place" perceived by nurses working in hospitals. These criteria include both hardware and software aspects. Specifically, to create a comfortable working place, it is necessary to have good facilities and equipment, a reasonable workload, enough staffing, a reasonable level of salary, and avoid the imposition of unagreeable values. Furthermore, hospitals should maintain a good balance of the number of doctors and patients.

As it is already clear, the working conditions for nurses include extremely complex features. It will not be easy to make major improvements in the working environment so quickly. Kashima (2016) claims that it is necessary for nurses to make individual efforts, not to mention organizational efforts, to create a comfortable working environment. One way to make it easier for nurses to work is to strengthen their resilience. In light of this, more detailed studies are needed to clarify the factors that contribute to the low resilience of the nurses. It shall be effective to identify the factors of working conditions in the nursing department using resilience and relaxation as indicators.

4. Limitations and future prospects of this study

The study population in this study was limited to the employees of the hospital, therefore, the study should be positioned as a pilot study. According to Ishida (2018), a sample size of approximately 200 or more is required to examine the validity of the ARS through confirmatory factor analysis. In addition, to examine goodness-of-fit indices for the model, Standardized Root Mean Residual (SRMR), Comparative Fit Index (CFI), Root Mean Square of Approximation (RMSA), and Akaike Information Criterion (AIC) shall be conducted in the future. It will be important that these conditions are satisfied in order to be accepted

as the goodness-of-fit of the model (Tanaka, 2013). The ARS used in this study was examined only at one institution. Therefore, it is premature to introduce this scale to the recovery wards of various hospitals.

In rehabilitation departments, physical therapists, occupational therapists, and speech-language-hearing therapists have different job descriptions, therefore, differences in resilience among them must be examined. On the other hand, the Resilience scores of the nursing department showed the lowest, and that of the care worker department showed the highest. However, it is still premature to claim any general statement that the resilience of the nursing department is low or the resilience of the care worker department is high. In order to examine the criteria for resilience, it is necessary to conduct a survey not only at this facility but also in other institutions with a wider range of subjects.

In this study, the hospital's employees were asked to participate in the study and they were given the survey materials by their supervisors. As the subjects were asked by their boss to fill in the questionnaire, some kind of bias may have affected the survey results. In the future, it is necessary to consider a procedure that allows direct distribution from the researcher to the respondents.

Although the relationship between resilience and relaxation was demonstrated, more analysis based on various confounding factors is necessary for addition to verification of the impact of relaxation on resilience. If the effects of relaxation on resilience are clarified, it would be worthwhile to introduce a relaxation method that can be easily and effectively implemented to strengthen the resilience of employees. At the same time, it is necessary not only to introduce the relaxation method but also to examine the causes of low resilience in the nursing department from various perspectives.

In conclusion, this study is a pioneering study that clarifies the effects of relaxation on resilience and can contribute to the development of approaches to resilience. In the future, it is necessary to review the procedures for subjects, including those at other facilities, and to verify the validity of the ARS used in this study by confirmatory factor analysis. Then the differences between occupations shall be examined.

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