〈Regular Article〉

Depression among human care service professionals and positive/negative work life events: a structural equation modeling analysis

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ABSTRACT　The aim of this study was to examine the relationships between Positive Work Life Events1-2 (PWLE1-2), Negative Work Life Events1-2 (NWLE1-2), and depression in human care service professionals (HCSP) by multiple group analysis using structural equation modeling. Furthermore, we discuss approaches to alleviating depression in this population based on the results. A survey was conducted of nurses and other professionals (*N*=891) using the internet in March, 2014 and September, 2015. Results suggested that the likelihood of depression increases either when the experience frequency of PWLE1-2 is low, or when NWLE1-2 is high. Therefore, we believe that it is possible to alleviate depression in HCSP by promoting PWLE1-2 and reducing NWLE1-2. PWLE1-2 and NWLE1-2 are familiar episodes in the HCSP workplace. Paying attention to experience PWLE1-2 and NWLE1-2 may help improve depression in the workplace via such practices as social sharing. Such a naturalistic approach would be particularly cost-effective.　doi：10.11482/KMJ-E44(2)53　*(Accepted on Oct 26, 2018)*

Key words：Depression, Human care service professionals, Positive/negative work life events, Structural equation modeling analysis

INTRODUCTION

Background of the study

The diversification of lifestyles and changes in Japanese population structure are expanding the activity domain of human care service professionals (HCSP) that are nurses, care workers and so on. Because the demand for HCSP is expected to remain high for the foreseeable future, it is necessary to consider how they can be fully active in the workplace.

However, there are indications that HCSP occasionally suffer harm to their mental health at the workplace. For example, HCSP often experience poor mental health such as burnout[1] and/or depression[2]. It is believed that these conditions can have an adverse effect on HCSP's performance and reduce the quality of their working lives.

In order to avoid negative impacts on work life quality and performance, it is necessary to prevent poor mental health outcomes in HCSP. What points should we focus on to help HCSP avoid falling into poor mental health at the workplace? In this study, we focus on depression as one poor mental health outcome in HCSP, so as to consider the above points

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by drawing upon the results of the authors' past research.

Morimoto, Kanda, and Osada[3] reported on events in the working lives of HCSP that were related to Positive Affect (PA) and Negative Affect (NA). Specifically, they found such events could be divided into Positive Work Life Events (PWLE) and Negative Work Life Events (NWLE), and that these could be further divided according to two factors: "Relationship with co-workers" and "occupational roles". In this study, we defined positive work life events stemming from relationships with co-workers as PWLE1 and from occupational roles as PWLE2, and negative work life events arising from relationships with co-workers as NWLE1 and from occupational roles as NWLE2.

Morimoto et al.[3] measured PA and NA using the Japanese version of the Positive and Negative Affect Schedule (PANAS) scales[4] (the original PANAS was created by Watson, Clark, & Tellegen[5]). In the model of emotions proposed by Watson et al.[5], PA and NA are placed on two orthogonal unipolar axes, and each axis is assumed to have a high arousal end and a low arousal end[6]. The PANAS aims at a pure marker measurement of PA and NA according to the Watson model, and is composed mainly of adjectives on the high arousal end, indicating high PA as well as high NA content[5]. Watson[7] has also reported that the emotional aspect of depression can be described using the two PA and NA factors. Specifically, the emotional aspect of depression can be described as low-arousal PA: low PA and high NA, and in particular Watson[7] recommended the measurement of low PA in terms of a relative absence of high PA. Accordingly, when assessing each PANAS item according to experience frequency, depressive affect should be captured by a combination of low frequency PA and high frequency NA. Furthermore, given the correlations between PA and PWLE1-2 and between NA and NWLE1-2, we can expect that experiencing low frequency PWLE1-2 in combination with high frequency NWLE1-2 would be associated with depression in HCSP.

Organization and Objectives of the Study

The model (Fig. 1) examined in this study was based on above-mentioned research[3, 5-7]. In this model, it is assumed that depression can be explained in terms of PA and NA, and that both PA and NA can in turn be explained by PWLE1-2 and NWLE1-2, respectively. Furthermore, it was assumed that PA is a negative path to depression and NA is a positive path to depression, while PWLE1-2 and NWLE1-2 are both positive paths to PA and NA respectively. Finally, because it was hypothesized that PWLE1 and PWLE2, NWLE1 and NWLE2, PWLE1 and NWLE1, PWLE2 and NWLE2 will have points of commonality and thus a covariant relationship respectively, covariance paths were established. In addition, "e1", "e2", and "e3" were error variance in Fig. 1.

The aim of this study was to verify the model described above, and to examine the relationships between PWLE1-2, NWLE1-2, and depression in HCSP. Furthermore, we discuss approaches to alleviating depression in this population based on the results.

METHOD

Survey Period and Procedure

The surveys were conducted using the internet in March, 2014 and September, 2015[1]. Specifically, the content of the surveys was delivered via the internet to HCSP working as monitoring members of the survey company, and their answers were obtained via the same internet interface. Respondents in 2014 did not overlap with respondents in 2015. Job contents and social background of HCSP did not change by two surveys opportunities. We believe that the difference of response opportunities did not affect survey contents
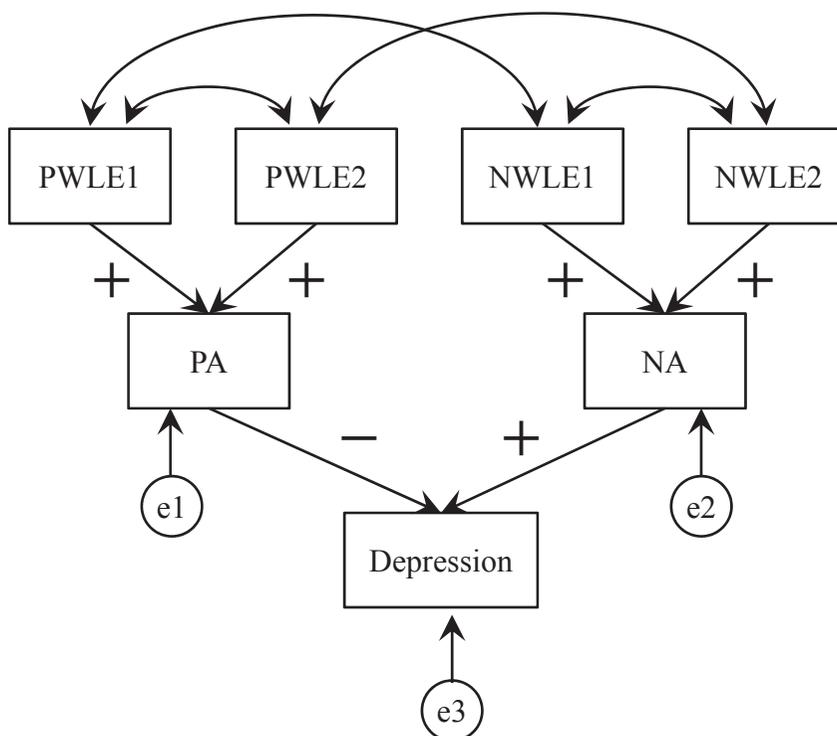
Fig. 1. The model that represented the arrangement of variables and positivity (+) and negativity (-) of connection between each variable in this study

and analysis results.

Target Group

   The target group consisted of six types of HCSP in Japan, including nurses, certified care workers, nursery teachers, elementary school teachers, physical therapists, and occupational therapists. They were members that registered with the survey company, and had been employed in respective workplace. Not including one-sided responses, there were 287 nurses, 214 certified care workers, 100 nursery teachers, 224 elementary school teachers, 31 physical therapists, and 35 occupational therapists, for a total target group of 891 individuals. The average age for each of these groups was 43 for nurses (age range = 24-65), 44 for certified care workers (age range = 22-65), 40 for nursery teachers (age range = 20-64), 48 for

elementary school teachers (age range = 25-64), 39 for physical therapists (age range = 24-55), and 40 for occupational therapists (age range = 26-58). Classified by gender, the target group consisted of 31 male and 256 female nurses, 124 male and 90 female certified care workers, 12 male and 88 female nursery teachers, 133 male and 91 female elementary school teachers, 22 male and 9 female physical therapists, and 14 male and 21 female occupational therapists.

Survey Content

   PWLE and NWLE. PWLE and NWLE were measured using the items created by Morimoto *et al.* [3], with some additions and modifications. Further, Morimoto & Suzue [8] verified validity of PWLE and NWLE items in elementary school teachers because these items were not created for

Table 1. Items of PWLE 1-2 and NWLE 1-2

Work Life Events	Items
PWLE1	I could exchange ideas with my co-workers.
	I was thanked by my co-workers.
	Teamwork at the workplace was good.
	I received acknowledgemets by my co-workers.
	There was a person whom I could respect as a human care service professional.
	I received the support of my co-workers.
	I cooperated with my co-workers.
	I had the consent of my co-workers.
PWLE2	I accomplished a demanding job.
	I learned to do a job I had not been able to do before.
	I completed my work smoothly.
	I was put in charge of a worthwhile job.
	I provided care that satisfied recipients.
	I understood the essence of the job.
	I obtained good results from my job.
NWLE1	I was unable to share information with co-workers.
	My co-workers were unreasonable toward me.
	I paid careful attention to my co-workers.
	My mistakes were pointed out by my co-workers.
	I had different opinions about work from my co-workers.
	It was hard for me to consult with my co-workers.
	I was compared with my co-workers.
	My co-workers became emotional about me.
	My co-workers did not cooperate well.
NWLE2	I was responsible for an important job that was beyond my abilities.
	I was charged with an unfamiliar job.
	I made mistakes at work.
	I was not confident in my role at my workplace.
	I could not perform ideal work.
	My expertise was useless for the job.
	I was suddenly required to be flexible in my performance at work.
	I was inexperienced in the knowledge and skills required for my job.

Note. Surveys conducted for Japanese respondents and in Japanese.

educational but medical personnel. The measure consisted of 8 and 7 items each for PWLE1 and 2, as well as 9 and 8 items for NWLE1 and 2, respectively. Respondents evaluated each item based on their experience frequency from the usual time to last six months on a four-point scale (1: never, 2: not often, 3: sometimes, 4: regularly). PWLE and NWLE items are listed in Table 1.

PA and NA. PA and NA were measured using the Japanese version of the PANAS scales[4]. In the Japanese version of the PANAS scales, the PA and NA subscales each consist of 8 items. Respondents evaluated each item by indicating the workplace experience frequency. The evaluation period and four-point scale was used for the method as employed for PWLE and NWLE.

Depression. Depression was measured using the Japanese version of Center for epidemiologic studies Depression (CES-D) scale, developed by Shima, Shikano, Kitamura, and Asai[9]. The Japanese version of the CES-D consists of 20 items (4 items reverse scored) related to depression. Respondents evaluated their experiences of each item on a 4 point scale (1: rarely or none of the time (less than 1 day during the past week), 2: some or a little of the time (1-2 days), 3: occasionally or a moderate amount

Table 2. Fit indices of multiple group analysis using structural equation modeling

Analysis model	Fit indices				
	GFI	AGFI	CFI	RMSEA	AIC
Nrs	0.917	0.788	0.891	0.168	—
CCW	0.926	0.811	0.910	0.152	—
NT	0.938	0.842	0.952	0.111	—
EST	0.960	0.898	0.957	0.094	—
RS (PT/OT)	0.945	0.859	0.970	0.082	—
Configral invariance	0.934	0.832	0.922	0.061	407.875
Measurement invariance 1	0.918	0.856	0.910	0.055	413.185
Measurement invariance 2	0.900	0.874	0.892	0.051	423.158
Measurement invariance 3	0.892	0.878	0.886	0.050	424.825

Note . Nrs:Nurse, CCW:Certified Care Worker, NT:Nursery Teacher, EST:Elementary School Teacher, RS:Rehabilitation Specialist(PT:Physical Therapist, OT:Occupational Therapist)

of time (3-4 days), 4: most or all of the time (5-7 days)).

Interpretation of Data

The responses on PWLE1-2, NWLE1-2, PA, and NA were each totaled. Additionally, the Japanese version of CES-D was scored according to Shima *et al.*[9]. Furthermore, in this study, the physical therapist and occupational therapist categories were treated as the single category of rehabilitation specialist, and therefore their data were combined for the analysis.

Ethical Considerations

The survey was conducted after being reviewed and receiving approval from the College Ethics Committee (to which the first author of this study belongs). On the start page of the internet survey, we informed the survey subject, and obtained the consent of the respondents.

RESULTS AND DISCUSSION

Multiple group analysis using structural equation modeling was implemented to verify our model (Fig. 1). Fit indices in the analysis are listed in Table 2. First, multiple group analysis was implemented using the data from each occupation category. Furthermore, the analysis was conducted using "the configural invariance model" that assumes the arrangement of variables indicated by our model will apply to the data from all occupational categories. Subsequently, taking the configural invariance model as a base, analysis of "measurement invariance models" were conducted on path coefficients, variance and covariance for each variable and among variables, and error variance with equality constraints between occupational categories in our model. Equality constraints were conducted in stages, from path coefficients only (measurement invariance model 1), path coefficients and variance/covariance (measurement invariance model 2), to path coefficients, variance/covariance and error variance (measurement invariance model 3).

As can be seen in Table 2, the data from nurses only did not fit our model. However, continuing analysis with the configural invariance model and measurement invariance models, the data were best fit to the configural invariance model (Goodness of Fit Index (GFI) = 0.934, Adjusted Goodness of Fit Index (AGFI) = 0.832, Comparative Fit Index (CFI) = 0.922, Root Mean Square Error of Approximation (RMSEA) = 0.061, Akaike Information Criterion (AIC) = 407.875). In addition, it is thought that the measurement invariance model 1 also matched data due to fit indices (GFI = 0.918, AGFI = 0.856, CFI = 0.910, RMSEA = 0.055). These suggested that the arrangement of variables and positivity or negativity of connections between each variable by our model did not change across occupational categories.

Path coefficients calculated from the analysis of the measurement invariance model 1 are shown in Table 3. All of these values are statistically significant. Furthermore, four indirect effects leading to depression were analyzed in measurement invariance model 1, from PWLE1-2 and NWLE1-2 through PA and NA. These indirect effects are expressed by multiplying path coefficients from PWLE1-2 and NWLE1-2 to depression. Here, bias-corrected 95% confidence intervals of the indirect effects were calculated by bootstrapping method. We found that all of the indirect effects (from PWLE1 to depression: [-0.489 -0.302], from PWLE2 to depression: [-0.445 -0.226], from NWLE1 to depression: [0.280 0.446], from NWLE2 to depression: [0.275 0.466]) were significant.

From these results, we were able to show that the likelihood of depression increases either when the experience frequency of PWLE1-2 is low, or when the experience frequency of NWLE1-2 is high. Therefore, we believe that it is possible to alleviate depression in HCSP by promoting PWLE1-2 and

Table 3. Path coefficients calculated from the analysis of the measurement invariance model 1

Predictor Variable	Criterion Variable		
	PA	NA	Depression
PWLE1	0.402 **		
PWLE2	0.342 **		
NWLE1		0.377 **	
NWLE2		0.389 **	
PA			-0.948 **
NA			0.953 **

**$p < .01$

reducing NWLE1-2.

There are various ways to promote PWLE1-2 and to reduce NWLE1-2. For example, we have been examining such an approach by focusing on social sharing[10]. Social sharing is behavior that involves sharing emotional experiences with peers[11]. We specifically defined social sharing as disclosing PWLE1-2 or NWLE1-2 and responding to disclosing behavior. We predict that when HCSP do social sharing of PWLE1-2, ratings of PWLE1-2 increase, and that when they do social sharing of NWLE1-2, ratings of NWLE1-2 decrease. It is assumed that social sharing could ease depression in HCSP.

Social sharing is related to a general collaborative work style in human care service. It is likely that HCSP disclose PWLE1-2 or NWLE1-2 and respond to disclosures of others as they collaborate with co-workers. PWLE and NWLE are familiar episodes in the human care service workplace. Paying attention to PWLE and NWLE experiences can help improve depression via collaboration as social sharing in the workplace. Such a naturalistic approach in human care service would be particularly cost-effective.

AUTHOR NOTE

Part of this study was presented at 31th International Congress of Psychology (ICP2016). The authors have no conflicts of interest directly relevant to the content of this article.

FOOTNOTE

[1] The data from the survey conducted in March, 2014 and September, 2015 have been analyzed from a different perspective than that used in this study; this is described in Morimoto & Suzue[8], Morimoto & Osada[10], and Morimoto & Inada[12].

REFERENCES

1) Kubo M, Tao M: Burnout: Concepts and methods. Japanese Psychological Review 34: 412-431, 1991. (In Japanese)

2) Koyama A, Yasuda, K, Niki M, Santo M, Hirano T, Jinnai R, Iwagami K, Nagano K: Occupational stress and mental health in human service professionals: Health care, education and welfare professionals. Japanese Journal of Psychosomatic Medicine 43: 679-688, 2003.

(In Japanese)

3） Morimoto H, Kanda Y, Osada H: Work life events correlated to affective states of human care service professionals. Journal of Human Care Studies 12: 35-51, 2011. (In Japanese)

4） Sato A, Yasuda A: Development of the japanese version of positive and negative affect schedule (PANAS) scales. Japanese Journal of Personality 9: 138-139, 2001. (In Japanese)

5） Watson D, Clark LA, Tellegen A: Development and validation of brief measures of positive and negative affect: The PANAS scales. Journal of Personality and Social Psychology 54: 1063-1070, 1988.

6） Watson D, Tellegen A: Toward a consensual structure of mood. Psychological Bulletin 98: 219-235, 1985.

7） Watson D, Kendall PC: Understanding anxiety and depression: Their relation to negative and positive affective states, In Anxiety and Depression: Distinctive and overlapping features. Personality, psychopathology, and psychotherapy (Kendall PC, Watson D, eds). San Diego, Academic Press, 1989, pp.3-26

8） Morimoto H, Suzue T: Investigation of work life events

related to negative or positive affect in elementary school teachers: Contributing to primary prevention of poor mental health. Journal of Health Education Research 19: 97-106, 2016. (In Japanese)

9） Shima S, Shikano T, Kitamura T, Asai M: New self-rating scales for depression. Seishin Igaku 27: 717-723, 1985. (In Japanese)

10） Morimoto H, Osada H: The preservation of mental health in terms of social sharing for positive/negative work life events in human care service professionals. Paper presented at Japanese psychological academy for human care the 17th annual meeting (Tokyo, Japan), 43, 2015. (In Japanese)

11） Rime B, Mesquita B, Philippot P, Boca S: Beyond the emotional event: Six studies on the social sharing of emotion. Cognition and Emotion 5: 435-465, 1991.

12） Morimoto H, Inada M: Prevention of depression in human care service professionals caused by work life events that evoke negative or positive affect. Bulletin of Kawasaki College of Allied Health Professions 35: 1-8, 2015. (In Japanese)