

ORIGINAL ARTICLE

Occupational engagement affects personal recovery in people with mental disorders, and cognitive dysfunction and occupational dysfunction affect occupational engagement

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INTRODUCTION

Recovery is a way of living life that is satisfying, hopeful and contributing, despite the limitations of an illness; it involves creating new meaning and purpose in an individual's life as they grow beyond the devastating effects of mental illness (Anthony, 1993). Recovery has been set as a mental health policy in several countries (Department of Health, 2001; New Zealand Ministry of Health, 1997; Australian Health Ministers, 2003). As a major goal in the area of mental health welfare, great importance is placed on recovery support. Recovery as a concept is divided into clinical recovery and personal recovery. Clinical recovery focuses on sustained remission and functional recovery, while personal recovery focuses on living a satisfying, hopeful, and contributing life, despite the limitations of the disease (Slade, 2008). In

Abstract

Background: Personal recovery is a major goal in the field of mental health and welfare, and recovery support is of great importance. However, there has not yet been a full exploration of the direct relationship between personal recovery and occupational engagement and occupational and cognitive dysfunction, which are commonly treated within the field of occupational therapy. The aim of this study was to identify factors that influence recovery.

Methods: Included in the study were 30 of our patients with schizophrenia or mood disorders. Recovery was measured by the Japanese version of the Recovery Assessment Scale (RAS), occupational engagement by the Self-completed Occupational Performance Index (SOPI), occupational dysfunction by the Screening Tool for the Classification of Occupational Dysfunction (STOD), and cognitive function by the Brief Assessment of Cognition in Schizophrenia (BACS). Correlation between each variable was examined by performing multiple regression analysis with RAS and SOPI as dependent variables.

Results: RAS had significant correlation with many domains of SOPI and with the occupational alienation domain of STOD, but not with BACS. SOPI and anti-anxiety medication dose affected RAS, while SOPI was affected by the occupational marginalization domain of STOD and the executive function domain of BACS.

Conclusions: Important factors in supporting recovery were focusing on the individual's independent decision-making and executive functioning, and helping the individual identify and engage in meaningful occupations.

this paper, we mainly consider the personal recovery aspect of recovery.

Recovery has been suggested to have five components: connection, hope and optimism, identity, meaning of life, and empowerment (Leamy, 2011), and focusing on these components is important in order to support recovery. In this context, occupational therapists assist subjects in occupational engagement, namely what the recipients want, need, or are expected to do (The World Federation of Occupational Therapists (WFOT), 2012). Engaging in meaningful and valuable occupation is thought to foster the aforementioned five components of recovery and thus facilitates recovery (Doroud, 2015).

Occupational engagement has been reported to be associated with occupational dysfunction (Teraoka, 2019). It is classified into four categories: occu-

pational alienation, occupational imbalance, occupational marginalization, and occupational deprivation (Kielhofner, 1999; Teraoka, 2019). Occupational alienation is associated with prolonged experiences of disconnection, isolation, emptiness, and a sense of meaninglessness; it is a state in which an individual is unable to find meaning in their occupation. Occupational imbalance is a state of temporal and semantic imbalance, while occupational marginalization is the limitation of opportunities for action through individual decisions about when, where, and how a person should engage in an occupation. In occupational deprivation, an individual is prevented from engaging in necessary and meaningful occupation due to factors beyond their control for an extended period of time (Townsend, 2004). Occupational engagement and occupational dysfunction have been reported to affect the recovery of people with mental disorders (Watanabe, 2022).

Meanwhile, cognitive dysfunction has also been implicated in the outcomes of people with mental disorders (Green, 1996, 2000). Associations have been reported between recovery and memory function (Cuesta, 2022) and with executive function (Zaytseva, 2012), suggesting that support for cognitive dysfunction may promote recovery and support social outcomes.

Although various factors are thought to influence recovery, previous studies have not sufficiently simultaneously measured and examined the strength of effects of the relationship between occupational engagement, occupational dysfunction, cognitive dysfunction, and recovery, which are often handled in occupational therapy. This study therefore aims to simultaneously and directly examine the associations between these variables and the strengths of the factors influencing recovery. With improved understanding, it may become possible to suggest what should be emphasized within recovery support in clinical settings.

METHODS

We conducted a cross-sectional survey between June 2021 and June 2023 based on subjective and objective evaluations. The study content was carefully explained to the heads of the facilities that took part in the study and their consent to cooperation in the research was obtained. The institution where the study was conducted is a general hospital with psychiatric beds and a relatively large number of chronically mentally ill patients. Data were

collected only from subjects who provided consent to the study.

Subjects

Patients with schizophrenia or mood disorders were included in this study, this included both patients in and out of psychiatric hospitals. Inclusion criteria were those who participated in psychiatric occupational therapy or psychiatric day care at least once a week, those who were at least 20 years of age with consent to participate in the study, and those who were deemed by the attending physician to be sufficiently competent to consent to and undergo the examination. Regarding the inclusion criterion of those who participated in psychiatric occupational therapy or psychiatric day care at least once a week, this criterion was included as a control condition for being engaged in some type of occupation because the study included an item measuring occupational engagement. Exclusion criteria were those with a history of cerebrovascular disease or alcohol or drug dependence within 6 months because it was thought these factors would obscure the results.

Measurements

Demographics data

Information on age, gender, diagnosis, duration of illness, years of education, employment history, marital status, the use of chlorpromazine (CP) equivalent, and the use of diazepam (DZP) equivalent was obtained from medical records.

Recovery

The Japanese version of the Recovery Assessment Scale (RAS) (Chiba, 2010) was used to investigate the recovery process. RAS consists of 24 items in five domains: goal/success orientation and hope (9 items), reliance on others (4 items), personal confidence (5 items), no domination by symptoms (2 items), and willingness to ask for help (4 items). Each item was answered by the subjects themselves on a five-point Likert scale. Scores range from 24 to 120, with higher scores indicating a higher degree of recovery.

Occupational engagement

The Self-completed Occupational Performance Index (SOPI) (Imai, 2010) was used to examine occupational engagement. SOPI consists of nine items in the three domains of leisure activities, productive activities, and self-care. Each of the three domains has three aspects: control of occupation, occupation-

al balance, and satisfaction with performance. Each item was answered by the subjects themselves on a five-point Likert scale. The scores given in response were converted to a 100-point scale from 0 to 100, with higher scores indicating better occupational engagement.

Occupational dysfunction

Occupation dysfunction was assessed by the Screening Tool for the classification of Occupational Dysfunction (STOD) (Seike, 2019). STOD consisted of four domains: occupational imbalance (4 items), occupational deprivation (3 items), occupational alienation (4 items) and occupational marginalization (3 items). There are thus 14 items, each of which was rated by an occupational therapist separate from the first author on a six-point Likert scale. Scores range from 6 to 84, with higher scores indicating greater occupation dysfunction.

Cognitive function

The Brief Assessment of Cognition in Schizophrenia (BACS) (Kaneda, 2007) was used to assess cognitive function. BACS consists of five tests of verbal memory, working memory, motor speed, verbal fluency, attention, and executive function. Each test and total score was converted to a z-score using the average score for each age group. The z-score is set at 0 as the age-specific mean, and the larger the z-score in the positive direction, the higher the cognitive function. The examination was performed by a different occupational therapist from the first author.

Statistical analysis

Descriptive statistics for each item were calculated, and RAS total scores and group comparisons for each domain were performed by Mann-Whitney's U test for the disease name, inpatient and outpatient, gender, employment history, and marital status. Due to the insufficient number of people analyzed in this study, a correlation analysis was conducted beforehand in order to select explanatory variables to be entered in the regression analysis. First, correlations between RAS and basic information, SOPI, STOD, and BACS were examined using Spearman's rank correlation coefficient. Multiple regression analysis using the stepwise method was then conducted with RAS as the dependent variable and the items that had significant correlation with RAS in the prior correlation analysis as independent variables. In addition, multiple regression analysis using the stepwise method was conducted again with items that were

significant in the first multiple regression analysis as the dependent variables and the item with significant correlation with the item in question in the prior correlation analysis as the independent variable. The significance level was set at 5%. For statistical analysis, Jamovi (2.4.0.0) (Fox, 2020; Kerby, 2014; R Core Team, 2022; The Jamovi project, 2023) was used for calculation of basic statistics, group comparisons, and correlation analysis, and EZR (Kanda, 2013) was used for multiple regression analysis. EZR is a graphical user interface for R (The R Foundation for Statistical Computing, Vienna, Austria), or more precisely, an improved version of R commander designed to add statistical functions that are frequently used in biostatistics.

Ethical considerations

The purpose and content of the study, the method of processing the data obtained from the survey, and the fact that there would be no disadvantage if the subject withdrew during the course of the study were carefully explained to the subjects orally and in writing. Only those who gave their consent were included in the analysis. This study was approved by the Osaka Kawasaki Rehabilitation University Research Ethics Review Committee (OKRU21-A011) and was conducted in accordance with the Declaration of Helsinki.

RESULTS

Descriptive statistics and group comparisons

Data were collected from 30 patients (61.9 ± 12.8 years old, 17 women). Descriptive statistics for each measure are shown in Table 1. For the DZP equivalents, the standard deviation values were larger than the mean, suggesting a floor effect. The median duration of disease was 29.0 years (14.5-39.3), suggesting that the patients as a whole were subject to a chronic course. There were no significant differences between the two groups in both the RAS total score and subfactors, either by inpatient or outpatient status, gender, work experience, or marital status.

Results of the correlation analysis

The results of the correlation analysis between each item are shown in Table 2. The RAS total score showed a significant positive correlation with the SOPI total score and with many of the individual domains and aspects, especially with the SOPI total score, ($\rho = 0.44$, $p = 0.014$) and occupational balance ($\rho = 0.56$, $p = 0.001$), with moderate positive correla-

tion. On the other hand, STOD was significantly negatively correlated only with the domain of occupational alienation ($\rho = -0.37, p = 0.041$), while BACS was not significantly correlated with it. There was a significant trend toward a negative correlation with CP equivalents and DZP equivalents, but no correlation with age, duration of illness, or years of education.

SOPI showed a moderately significant negative correlation with STOD total score ($\rho = -0.47, p = 0.008$) and occupational marginalization ($\rho = -0.51, p = 0.004$), a negative correlation with the STOD occupational deprivation domain, $\rho = -0.35, p = 0.055$) and a positive significant trend correlation with the BACS executive functioning domain ($\rho = 0.33, p = 0.076$).

Table 1. Descriptive statistics for each survey item

	Mean	Standard deviation	Median	25th	75th
Diagnosis		27 schizophrenia, 3 mood disorders			
Inpatient/Outpatient		25 inpatients, 5 outpatients			
Age	61.90	12.81	65.0	(50.25 -	70)
Gender		13 males, 17 females			
CP equivalent	413.39	407.65	282.6	(37.5 -	605.58)
DZP equivalent	2.08	3.76	0.0	(0 -	3.75)
Duration of disease (years)	28.17	16.93	29.0	(14.5 -	39.25)
Years of education	13.27	1.95	13.0	(12 -	14.75)
Work experience		10 with work experience, 20 without work experience			
Marital status		Married: 10; not married: 20			
STOD	53.07	12.63	56.0	(51 -	59.75)
Occupational imbalance	12.30	3.98	12.0	(10 -	15)
Occupational deprivation	15.03	5.53	18.0	(15.25 -	18)
Occupational alienation	13.53	4.06	13.5	(11 -	16)
Occupational marginalization	12.20	3.96	14.0	(11 -	15)
SOPI	51.67	26.58	52.8	(29.17 -	75)
Control of occupation	9.10	3.54	9.5	(6.25 -	12)
Occupational balance	9.40	3.40	9.0	(6.25 -	12)
Satisfaction with performance	9.10	3.68	9.0	(6 -	12.75)
Leisure activities	9.50	3.52	10.5	(6 -	12)
Productive activities	8.03	4.23	8.5	(3.25 -	11)
Self-care	10.07	3.71	11.0	(7 -	12.75)
RAS	82.50	14.34	80.5	(71.75 -	92.5)
Goal/success orientation and hope	31.63	7.30	30.5	(26 -	37.75)
Reliance on others	13.63	3.07	13.5	(12 -	15.75)
Personal confidence	17.00	3.84	17.0	(14.25 -	19.75)
No domination by symptoms	6.83	2.04	6.0	(6 -	8)
Willingness to ask for help	13.50	2.42	14.0	(12 -	14.75)
BACS	-2.80	1.53	-2.5	(-4.16 -	-1.77)
Verbal memory	-2.07	1.25	-2.3	(-2.9 -	-1.1)
Working memory	-1.84	1.25	-1.8	(-2.54 -	-0.7)
Motor speed	-1.46	1.20	-1.4	(-2.07 -	-0.68)
Verbal fluency	-1.61	0.95	-1.6	(-2.05 -	-1.1)
Attention	-1.85	1.47	-2.0	(-2.65 -	-0.88)
Executive function	-1.58	1.97	-1.2	(-2.89 -	-0.09)

CP: Chlorpromazine, DZP: Diazepam, STOD: Screening Tool for the classification of Occupational Dysfunction, SOPI: Self-completed Occupational Performance Index, RAS: Recovery Assessment Scale, BACS: Brief Assessment of Cognition in Schizophrenia

Table 2. Results of correlation analysis

	RAS	Goal/success orientation and hope	Reliance on others	Personal confidence	No domination by symptoms	Willingness to ask for help	SOPi	Control of occupation	Occupational balance	Satisfaction with performance	Leisure activities	Productive activities	Self-care
SOPi	0.44 **	0.26	0.20	0.48 ***	0.44 **	0.38 **	—	—	—	—	—	—	—
Control of occupation	0.31 *	0.12	0.14	0.38 **	0.37 **	0.31 *	—	—	—	—	—	—	—
Occupational balance	0.56 ***	0.41 **	0.39 **	0.43 **	0.44 **	0.46 **	—	—	—	—	—	—	—
Satisfaction with performance	0.37 **	0.21	0.14	0.45 **	0.34 *	0.35 *	—	—	—	—	—	—	—
Leisure activities	0.38 **	0.34 *	0.09	0.27	0.26	0.49 ***	—	—	—	—	—	—	—
Productive activities	0.33 *	0.12	0.26	0.44 **	0.35 *	0.31 *	—	—	—	—	—	—	—
Self-care	0.38 **	0.16	0.21	0.37 **	0.43 **	0.17	—	—	—	—	—	—	—
STOD	-0.17	-0.03	-0.23	0.00	-0.43 **	-0.17	-0.47 ***	-0.38 **	-0.41 **	-0.42 **	-0.50 ***	-0.24	-0.49 ***
Occupational imbalance	0.15	0.21	0.06	0.25	-0.33 *	0.20	-0.24	-0.28	-0.11	-0.17	-0.21	-0.07	-0.33 *
Occupational deprivation	-0.02	0.17	-0.14	-0.02	-0.30	-0.19	-0.35 *	-0.28	-0.40 **	-0.28	-0.16	-0.35 *	-0.42 **
Occupational alienation	-0.37 ***	-0.35 *	-0.32 *	-0.24	-0.35 *	-0.10	-0.23	-0.09	-0.25	-0.23	-0.34 *	0.07	-0.31 *
Occupational marginalization	-0.13	0.00	-0.22	0.06	-0.28	-0.29	-0.51 ***	-0.53 ***	-0.39 **	-0.48 ***	-0.56 ***	-0.46 **	-0.36 *
BACS	0.16	0.21	0.01	-0.14	0.29	0.17	0.19	0.13	0.18	0.15	0.35 *	0.06	0.07
Verbal memory	0.10	0.19	-0.19	-0.11	0.16	0.09	0.08	0.02	0.03	0.06	0.24	-0.06	0.00
Working memory	0.13	0.09	0.08	-0.10	0.18	0.06	0.26	0.19	0.19	0.28	0.39 **	0.02	0.30
Motor speed	-0.05	-0.06	-0.01	-0.03	0.13	-0.20	-0.20	-0.25	-0.17	-0.15	-0.10	-0.26	-0.08
Verbal fluency	0.15	0.16	-0.05	-0.07	0.21	0.22	0.16	0.20	0.10	0.15	0.41 **	-0.05	0.13
Attention	0.09	0.10	0.12	-0.18	0.35 *	0.02	0.03	-0.04	0.12	-0.03	0.11	-0.05	0.05
Executive function	0.08	0.12	0.03	-0.13	0.14	0.31 *	0.33 *	0.31	0.24	0.33 *	0.36 *	0.35 *	0.06
Age	-0.06	-0.05	-0.16	-0.10	0.02	-0.21	-0.22	-0.29	-0.13	-0.18	-0.14	-0.33 *	0.03
Gender	-0.32 *	-0.43 **	-0.11	-0.09	-0.32 *	-0.09	-0.05	0.02	-0.02	-0.12	-0.01	0.00	-0.05
CP equivalent	-0.33 *	-0.46 **	-0.05	-0.33 *	-0.13	0.00	0.21	0.30	0.08	0.21	0.16	0.28	0.15
DZP equivalent	0.03	0.09	-0.09	0.02	-0.09	0.16	-0.13	-0.25	0.09	-0.12	0.05	-0.12	-0.19
Years of education	-0.15	-0.23	-0.23	-0.01	0.20	0.07	0.11	0.04	0.06	0.20	0.07	0.15	0.03

* $p < .10$, ** $p < .05$, *** $p < .01$

CP: Chlorpromazine, DZP: Diazepam, STOD: Screening Tool for the classification of Occupational Dysfunction, SOPi: Self-completed Occupational Performance Index, RAS: Recovery Assessment Scale, BACS: Brief Assessment of Cognition in Schizophrenia

Results of multiple regression analysis

The results of multiple regression analysis with the RAS total score as the dependent variable and the SOPI, STOD, and BACS total scores and the CP and DZP equivalents as independent variables are shown in Table 3. There was more than significant correlation with the RAS total score and RAS sub-factors. The SOPI total score ($\beta = 0.72$, 95% confidence interval: 0.40-1.05, $p < 0.001$, VIF = 1.35) and DZP equivalent ($\beta = -0.53$, 95% confidence interval: -0.86- -0.21, $p = 0.003$, VIF = 1.38) were the factors that significantly affected the RAS (adjusted for degrees of freedom $R^2 = 0.48$, $F(5,24) = 6.27$, $p < 0.001$), and the effects of the other variables were rejected. Notably, the Durbin-Watson statistic was 1.54 ($p = 0.176$), which confirms that there was little or no autocorrelation.

The results of multiple regression analysis with SOPI total score as the dependent variable and

the STOD domains of occupational deprivation and occupational marginalization and the BACS domain of executive function as independent variables are shown in Table 4. More than a significant trend correlation was shown with SOPI total score. The STOD domain of occupation marginalization ($\beta = -0.69$, 95% confidence interval: -1.34- -0.05, $p = 0.037$, VIF = 4.41) and the BACS domain of executive function ($\beta = 0.32$, 95% confidence interval: 0.01- 0.64, $p = 0.043$, VIF = 1.05) were the factors that significantly affected the SOPI total score (adjusted for degrees of freedom $R^2 = 0.35$, $F(3,26)=6.27$, $p=0.002$), while the effect of the STOD domain of occupation deprivation was rejected. Notably, the Durbin-Watson statistic was 1.96 ($p = 0.962$), confirming that there was virtually no autocorrelation. A schematic diagram of the results of multiple regression analysis with RAS and SOPI as dependent variables is shown in Figure 1.

Table 3. Results of multiple regression analysis with RAS as dependent variable.

variable	estimated value	standard error	t	p	β	95% confidence interval	
						lower	upper
CP equivalent	0.00	0.01	0.11	0.914	0.02	-0.30	0.33
DZP equivalent	-2.03	0.60	-3.37	0.003	-0.53	-0.86	-0.21
SOPI	0.39	0.08	4.64	<0.001	0.72	0.40	1.05
STOD	0.33	0.18	1.81	0.083	0.29	-0.04	0.62
BACS	2.43	1.46	1.66	0.110	0.26	-0.06	0.58

Degrees of freedom adjusted $R^2=0.48$, $F(5, 24) = 6.27$, $p < 0.001$

RAS: Recovery Assessment Scale, CP: Chlorpromazine, DZP: Diazepam, SOPI: Self-completed Occupational Performance Index, STOD: Screening Tool for the classification of Occupational Dysfunction, BACS: Brief Assessment of Cognition in Schizophrenia

Table 4. Results of multiple regression analysis with SOPI as the dependent variable.

variable	estimated value	standard error	t	p	β	95% confidence interval	
						lower	upper
BACS Executive function	4.39	2.07	2.12	0.043	0.32	0.01	0.64
STOD Occupational marginalization	-4.64	2.11	-2.20	0.037	-0.69	-1.34	-0.05
STOD Occupational deprivation	1.13	1.50	0.75	0.458	0.24	-0.41	0.88

Degrees of freedom adjusted $R^2=0.35$, $F(3, 26) = 6.272$, $p = 0.002$

SOPI : Self-completed Occupational Performance Index, STOD : Screening Tool for the classification of Occupational Dysfunction, BACS : Brief Assessment of Cognition in Schizophrenia

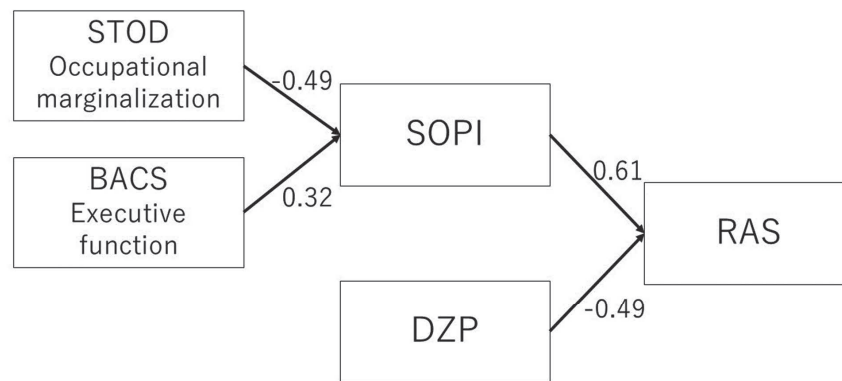


Figure 1. Schematic of the results of the multiple regression model. The numbers represent standardization coefficients (β). DZP: Diazepam, STOD: Screening Tool for the classification of Occupational Dysfunction, SOPI: Self-completed Occupational Performance Index, RAS: Recovery Assessment Scale, BACS: Brief Assessment of Cognition in Schizophrenia

DISCUSSION

This study aimed to investigate recovery and occupational engagement, occupational dysfunction, and cognitive dysfunction among people with mental disorders, and to identify factors associated with recovery. The results of the survey and analysis revealed that occupational engagement and the amount of anti-anxiety medication had a direct and significant impact on recovery, while occupational marginalization and executive dysfunction had an impact on occupational engagement.

The five key components of recovery are connection and belonging, hope and optimism, identity and self-concept, meaning and purpose, and empowerment (Leam, 2011). Occupational engagement is closely related to these five components; it has been reported to be associated with social contact, positive effect (Eklund, 2012), and identity (Hitch, 2013). A close relationship between recovery and occupational engagement was also reported in the scoping review by Doroud (2015). Recovery requires the specific experience of being engaged in occupation in an individual's usual context, which facilitates the recovery component (Doroud, 2015). The present findings are consistent with these previous studies, and suggest that good occupational engagement is closely related to recovery and it may even be a facilitator of recovery. Regardless of gender, disease name, or whether an individual is an inpatient or outpatient, the ability to engage in daily occupations that are important to the individual is associated with recovery. It is especially important to have a balance of occupation that is commensurate with an individual's own abilities and energies, and the individual is not over- or under-working. Better occupational balance is associ-

ated with greater well-being and recovery (Eklund, 2016), and occupational balance is suggested by the results to be an important factor in promoting recovery. Medication content was also added as a variable in the current study, and recovery was shown to be significantly influenced by the DZP equivalent, a measure of the dose of anxiolytic medication. Generally, antipsychotic drugs are used to treat schizophrenia, and the CP equivalents are those in the current study. Antipsychotic side effects do not reportedly affect subjective recovery (Concerto, 2023), and the present results support this. On the other hand, a direct relationship with recovery for anxiolytic medications has not been found in previous reports, so this study is perhaps the first to do so. Benzodiazepines, the leading class of anxiolytics, are relatively safe, but side effects include decreased psychomotor activity, memory impairment, muscle relaxant effects, tolerance and dependence (Longo, 2000). In particular, muscle relaxant effects and the formation of tolerance and dependence are uncommon side effects of antipsychotics and are specific to anxiolytics. These muscle relaxant effects and the formation of dependence are thought to impede recovery in those who take the drug. For example, the muscle relaxant effects may cause a lack of motivation to engage in any activity and the user may lose sight of goals, such thoughts and actions may continue, and the formation of dependence may cause a loss of confidence in the individual without the anti-anxiety medication. However, it is not sufficient to clarify the mechanism of the negative effect of the DZP equivalent on recovery only from the present results. It is however possible that the side effects described above may have affected the subject's thinking and behavior. The

CP equivalent ranged from 37.5 to 605.58 mg, which is close to the usual dosage, while the DZP equivalent ranged from 0 to 3.75 mg, which is extremely small. Based on this statistical analysis, it cannot be said that the CP equivalent is irrelevant and that only the DZP equivalent affects the RAS. Given that the CP-equivalent dose was close to the normal dose, it is reasonable to interpret that the CP-equivalent dose could also affect recovery, and that DZP could also affect recovery on top of that.

Occupational dysfunction had no direct impact on recovery. While the RAS and SOPI contain questions that easily reflect the wishes and intentions of the individual, those in STOD are objective indicators that are evaluated by observation, and are sensitive to factors other than the individual, such as the surrounding environment, as well as the individual's intentions and behavior. Such differences may be related to STOD having no effect on the RAS. Meanwhile, occupational dysfunction was found to have an impact on occupational engagement. SOPI has also been found to be highly to moderately negatively correlated with occupational dysfunction (Teraoka, 2019). Our results showed only moderate correlations with some domains, but generally the same results as in previous studies. In particular, this study showed that among the occupational dysfunctions, the effect of occupational marginalization on SOPI was significant. An example of the marginalization of occupation in the life situations of the mentally disabled people who were the subjects of this study could be 'I want to go shopping, but the hospital staff is against it', or 'I want to work, but my family is against it, so I can't'. Given that work imbalance, occupational deprivation, and occupational alienation were not found to have a significant effect on SOPI, it can be said that the factor that inhibits occupational engagement of persons with mental disabilities is a situation against their will of occupational marginalization.

Recovery as measured by the RAS is also considered to be personal recovery, a somewhat different concept from clinical recovery, which includes cognitive function and the actual symptoms. Cognitive function as measured by BACS is likely to reflect clinical recovery, and it is likely that it had no direct impact on the RAS used in this study. Conversely, impairment of executive function, one of the components of cognitive function, was found to affect occupational engagement. Executive functions encompass a wide range of higher-order processes, such as working memory, cognitive flexibility, inhibition, behavioral and emotional control, initiation, and

planning, which are to be considered important for goal-directed behavior (Diamond, 2013). Executive functioning difficulties may negatively impact social competence and quality of life through pathways related to theory of mind and social cognition in children with developmental disabilities (de Vries, 2015; Leung, 2016). In other words, executive function is thought to be associated with planning, preparation, contextualization, and resourcefulness when a person performs some tasks, meaning that a strong executive dysfunction can also interfere with daily occupational engagement.

Although these occupational and executive dysfunctions had little direct impact on recovery, it was possible that they could have an indirect impact through occupational engagement. To support recovery, it is considered important to identify meaningful occupations for the subject and to help him or her engage in them. In addition, considering that occupational engagement is affected by marginalization and executive dysfunction, it is important to emphasize opportunities for the subject to make decisions and to take actions on his/her own, and to assist in executive dysfunction through cognitive function training, etc., so that marginalization does not occur.

Limitations of this study

The sample size for this study was limited and inadequate at 30 participants, due to the need to examine associations with other factors, to compare across groups such as by inpatient and outpatient status and by disease, and to use stepwise methods in multiple regression analysis. It is desirable to solve these problems by increasing the sample size, and to study the floor effect in the DZP equivalent amount, and by covariance structure analysis. This study was analyzed through a cross-sectional survey, so it is unclear whether the variables could actually be changed by the intervention, and therefore, the variables should be examined through a longitudinal survey.

CONCLUSION

Occupational engagement status and medication dosage may influence recovery, and occupational marginalization and executive dysfunction may influence occupational engagement. While items other than those included in this survey may have an impact on recovery, it is important in supporting the recovery of people with mental disabilities to properly assess whether they are working on occupations that are important to them as an individual. Recovery

support for persons with mental disabilities should also be addressed, taking into consideration the possibility that occupational engagement is affected by work marginalization, which refers to the limitation of opportunities for individuals to act on their own decisions, and executive function, among other cognitive functions.

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