

Comprehensive analysis of depression-related factors among middle-aged residents in Japan, an Eastern culture

A cross-sectional study

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Abstract

There is a need to comprehensively identify depression-related factors, including individual and socioeconomic factors, in each country or cultural area, to consider effective measures to address depression within communities. However, there are not enough studies on middle-aged residents in Japan or other Eastern countries to currently achieve this. Thus, the aim of this study was to comprehensively identify factors related to depression in middle-aged residents in Japan, an Eastern country.

The study design was cross-sectional. A questionnaire survey was conducted among all community residents aged 40 to 59 in a rural municipality in Western Japan. The questionnaire contained items on demographic characteristics, psychological factors, health-related behaviors, and socioeconomic factors. A Chi-Squared test or Fisher exact test was used to analyze the relationships between depression and each assessed factor. Next, a logistic regression analysis was performed to identify comprehensive relationships between depression and its related factors.

Data from 362 participants were analyzed. The average age was 51.5 years; 148 were male. A Chi-Squared test or Fisher exact test demonstrated that many psychological factors, health-related behaviors, and socioeconomic factors were significantly related to depression. A logistic regression analysis showed that depression was significantly associated with male gender, low sense of coherence, high cognitive stress levels, low help-seeking behavior, poor quality sleep, and a lack of hobbies. Nagelkerke R^2 was 51%.

This study revealed through multivariate analysis that depression was primarily associated with personal behavioral and psychological factors in Japan, an Eastern country with a holistic cultural background. This result is consistent with findings from Western countries. This study can contribute the promotion and evaluation of preventive measures for depression in Eastern culture that focus on individual behavioral and psychological factors.

Abbreviation: SOC = sense of coherence.

Keywords: depression, health-related behavior, holistic cultural country, psychological factors, socioeconomic factors

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1. Introduction

Suicide is a health problem worldwide,^[1] including in Japan. Middle-aged people are the group in Japan most prone to suicide, and major depression is a primary prodromal symptom of suicide behavior.^[2] It is therefore important to address or take steps to prevent major depression among middle-aged people as part of suicide prevention plans.

Major depression can be associated with health-related behavior, as well as a wide range of demographic, psychological, or socioeconomic factors. For example, exposure to abuse and neglect in childhood may also be related to depression in adulthood.^[3] Regarding psychological factors, it has been reported that individuals with depression often have unique sensory processing patterns.^[4] Moreover, these factors are expected to have varying degrees of influence on major depression based on cultural context. Specifically, there is a great cultural difference between Western individualistic culture and Eastern holistic culture^[5]; thus, the factors related to major depression presumably also differ between these 2 cultural groups. Previous studies indicate that the prevalence of major depression in Japan, an Eastern country, is lower than in the US, a Western country.^[6,7] Furthermore, another study reported the prevalence and related factors of postpartum depression differ

between Turkey, an Eastern country, and Spain, a Western country.^[8] Thus, it is thought that the effects and degrees of influence of various factors on major depression likely differ between Western individualistic cultures and Eastern holistic cultures.

Many people experience subclinical depressive symptoms that may lead to major depression. Therefore, it is necessary to include people who have subclinical depressive symptoms in community activities geared toward prevention and awareness of major depression.

Previous studies have revealed that comprehensively identifying depression-related factors, such as individual and socioeconomic factors, in each country by cultural area is essential to developing effective measures to prevent depression within communities. Previous studies of middle-aged residents in Japan have examined the relationship between depressive tendencies, socioeconomic factors, and health-related behavior,^[9] or between depressive tendencies and unhealthy lifestyle habits.^[10] However, these studies are insufficient to comprehensively examine individual and socioeconomic factors related to depression. Therefore, a comprehensive study of these factors in Japan is necessary to establish preventive measures against depression that consider Japan's cultural characteristics.

In the present study, a questionnaire survey was conducted with middle-aged residents in a designated Japanese community to comprehensively determine depression-related factors within this demographic group. It was hypothesized that, in addition to personal factors, community-related factors, such as participation in local activities and social capital, are strongly related to depression in Japan, due to its holistic cultural background. Thus, the aim of this study was to comprehensively examine depression-related factors in middle-aged residents of Japan and use the findings to explore potential effective measures to alleviate or prevent depression within this population.

2. Methods

2.1. Data collection

This was a cross-sectional study conducted in 2017. The research scope included all community residents aged 40 to 59 of a rural municipality in Western Japan. The inclusion criteria were residents who were within the target age group (40–59 years) and listed in the Basic Resident Register of the municipality included as the study area. The exclusion criteria were residents who had been admitted to a nursing home, with mental or physical disabilities, and had no actual residence; 101 people met these criteria and were therefore excluded. The survey was sent by mail to 1209 residents.

2.2. Measures

2.2.1. Independent variable. The independent variable was depression, which was measured using the Hospital Anxiety and Depression Scale (HADS).^[11,12] The HADS is designed to measure depression. A score of 8 or higher indicates a suspected case of depression.^[11]

2.2.2. Dependent variables. Dependent variables included demographic characteristics, psychological factors, health-related behaviors, and socioeconomic factors. Demographic characteristics were age, gender, living arrangements, occupation, and medical treatment status.

Psychological factors were type A behavior pattern, sense of coherence (SOC), stress, and stress management. Type A behavior pattern was measured using a self-report questionnaire developed by Maeda,^[13] with respondents who scored at least 17 points considered to display a type A behavior pattern.^[13]

SOC was measured using the University of Tokyo Health Sociology version of the 3-item Sense of Coherence Scale Ver. 1.2 (SOC3-UTHS).^[14] The SOC3-UTHS comprises 3 items which represent subordinate concepts of SOC: comprehensibility, manageability, and meaningfulness.

Respondents were also asked about cognitive stress and stressors. Degree of cognitive stress was rated using a 4-point Likert scale. Regarding stressors, we asked about the stressful life events they had experienced in the past year, referring to previous research.^[15] Eight items were listed as stressful life events (e.g., “trouble with a boss or coworkers”).

Sense of stress control and acquisition of stress management skills were assessed using a 4-point Likert scale. Regarding stress management practice, the stage of behavior change was determined with reference to previous studies based on the trans-theoretical model.^[16] “Action” and “maintenance” stage were defined as practice and other stages were regarded as no practice.

For health-related behaviors, we asked about alcohol consumption habits (frequency and quantity), smoking habits, exercise frequency, sleeping habits (pattern and quality), and body mass index (height and weight), referring to previous studies.^[17]

Among socioeconomic factors, help-seeking behaviors, social capital, frequency, and positiveness of participation in local activities, the presence of hobbies, and economic conditions were included. Participants were asked if they had any people or institutions, they could consult if needed (help-seeking), which they responded to using a 4-point Likert scale. Based on previous research,^[18] social capital was determined by asking, “When someone in the neighborhood needs help, do others in the neighborhood mind helping them?” Answers were rated using 4-point Likert scale. The frequency and positiveness of participation in local activities were rated using a 5-point Likert scale. The presence of hobbies was rated on a 4-point scale. Respondents rated their subjective economic situation using a 4-point Likert scale.

2.3. Statistical analysis

The variables were converted into dummy variables except for age. First, a Chi-Squared test or Fisher exact test was used to analyze the relationships between depression and each assessed item. Next, a logistic regression analysis was performed to identify comprehensive relationships between depression and the items.^[19] Depression was used as dependent variable, and independent variables were gender, age, and items that showed significant association in the previous analysis. The significance level was $P < .05$. Analysis was performed using data excluding cases with missing values for each analysis. SPSS version 26.0 was used in all statistical analyses.

2.4. Ethical considerations

This study was conducted by secondary use of the data of an anonymous self-administered questionnaire survey conducted by the local government as part of a health promotion project. The data does not contain any information that can be used to identify participants. Informed consent was obtained from the person in

charge of the local municipality regarding the secondary use of the data. An explanation was given to the participants by disclosing information on the homepage of the author's institution and through posters at the government office. This study was approved by the Ethical Committee of the University at which the study was conducted (E-1136-1).

3. Results

3.1. Participant characteristics

Replies were received from 393 respondents (response rate: 32.5%), of which 31 had refused to answer the questionnaire. Thus, data from 362 participants were analyzed. The average age of participants was 51.5 years, and 148 participants were male. The total prevalence rate of depression in the sample was 32.9% (37.1% in male and 29.9% in female).

3.2. Relationships between depression and assessed factors

Table 1 shows the relationships between depression and each assessed factor. Several psychological factors, health-related behaviors, and socioeconomic factors were found to be significantly related to depression.

3.3. Comprehensive associations of depression-related factors

In the logistic regression analysis, data were included from 310 participants, excluding those with missing values for the items used. The results showed that depression was significantly associated with male gender, low SOC, high cognitive stress levels, few help-seeking behaviors, low-quality sleep, and no hobbies (Table 2). Nagelkerke R² was 51%.

4. Discussion

4.1. Main findings of the present study

In the present study, we comprehensively analyzed depression-related factors in middle-aged residents in Japan, which is an Eastern country with a holistic cultural background. Univariate analysis significant associations between depression and several psychological factors, health-related behaviors, and socioeconomic factors. In addition, multivariate analysis indicated that depression is significantly associated with being male, low SOC, high cognitive stress levels, not seeking help, poor sleep quality, and a lack of hobbies. Given the holistic cultural background of Japan, it was hypothesized that depression would be strongly related to residents' connections with their local communities,

Table 1
Relationships between depression and its associated factors.

Variables	All cases					Male					Female				
	Depression		Non-depression		P	Depression		Non-depression		P	Depression		Non-depression		p
	N	%	N	%		N	%	N	%		N	%	N	%	
Demographic characteristics															
Gender															
male	53	37.1	90	62.9	.160										
female	60	29.9	141	70.1											
Living arrangements															
Living alone	13	38.2	21	61.8	.489	11	61.1	7	38.9	.035*	2	12.5	14	87.5	.157*
Other	100	32.4	209	67.6		42	33.6	83	66.4		57	31.1	126	68.9	
Occupation															
Full-time job	64	36.6	111	63.4	.193	37	39.4	57	60.6	.431	27	33.3	54	66.7	.440
Other	50	29.9	117	70.1		16	32.7	33	67.3		33	28.2	84	71.8	
Medical treatment status															
Receiving medical treatment	39	35.5	71	64.5	.497	16	34.0	31	66.0	.601	22	35.5	40	64.5	.225
Not receiving medical treatment	74	31.8	159	68.2		37	38.5	59	61.5		37	27.0	100	73.0	
Psychological factors															
Type A behavior pattern															
Type A	32	36.8	55	63.2	.304	11	29.7	26	70.3	.350	20	40.8	29	59.2	.049
Non-Type A	77	30.8	173	69.2		38	38.4	61	61.6		39	26.0	111	74.0	
Sense of coherence (SOC)															
High SOC	47	21.1	176	78.9	<.001	22	25.3	65	74.7	<.001	25	18.5	110	81.5	<.001
Low SOC	65	55.1	53	44.9		29	56.9	22	43.1		35	53.0	31	47.0	
Cognitive stress															
High stress	99	40.9	143	59.1	<.001	44	48.9	46	51.1	<.001*	54	36.0	96	64.0	<.001*
Low stress	11	11.1	88	88.9		7	14.0	43	86.0		4	8.2	45	91.8	
Life events															
Many life events	72	37.9	118	62.1	.031	27	40.9	39	59.1	.378	44	35.8	79	64.2	.021
Few life events	42	26.9	114	73.1		26	33.8	51	66.2		16	20.5	62	79.5	
Sense of stress control															
High stress control	75	26.6	207	73.4	<.001	34	29.8	80	70.2	.001*	40	24.1	126	75.9	<.001
Low stress control	36	60.0	24	40.0		17	65.4	9	34.6		19	55.9	15	44.1	
Stress management skills															
Acquisition	46	20.4	179	79.6	<.001	21	23.6	68	76.4	<.001	25	18.5	110	81.5	<.001
Non-acquisition	65	55.6	52	44.4		30	58.8	21	41.2		34	52.3	31	47.7	

(continued)

Table 1
(continued).

Variables	All cases					Male					Female				
	Depression		Non-depression		P	Depression		Non-depression		P	Depression		Non-depression		p
	N	%	N	%		N	%	N	%		N	%	N	%	
Stress management															
Practice	33	24.3	103	75.7	.004	11	25.0	33	75.0	.042	21	23.1	70	76.9	.041
No practice	79	39.5	121	60.5		42	42.9	56	57.1		37	36.6	64	63.4	
Health-related behaviors															
BMI															
Moderate	66	29.9	155	70.1	.254	30	34.5	57	65.5	.334	36	26.9	98	73.1	.701
Not moderate	39	36.1	69	63.9		23	42.6	31	57.4		16	29.6	38	70.4	
Frequency of drinking															
Not everyday drinker	77	30.9	172	69.1	.199	25	32.1	53	67.9	.174	51	30.2	118	69.8	<1.000*
Everyday drinker	37	38.1	60	61.9		28	43.1	37	56.9		9	28.1	23	71.9	
Quantity of drinking															
Less drinking	75	33.0	152	67.0	.998	25	38.5	40	61.5	.752	49	30.4	112	69.6	.717
More drinking	39	33.1	79	66.9		28	35.9	50	64.1		11	27.5	29	72.5	
Smoking															
Non-smoker	85	31.5	185	68.5	.242	29	35.4	53	64.6	.573	55	29.6	131	70.4	.773*
Smoker	29	38.7	46	61.3		24	40.0	36	60.0		5	33.3	10	66.7	
Exercise															
High exercise	25	24.5	77	75.5	.031	13	27.7	34	72.3	.103	12	22.2	42	77.8	.152
Low exercise	89	36.5	155	63.5		40	41.7	56	58.3		48	32.7	99	67.3	
Sleeping pattern															
7 or 8 hours	21	36.2	37	63.8	.563	14	53.8	12	46.2	.050	7	22.6	24	77.4	.398*
Other	93	32.3	195	67.7		39	33.3	78	66.7		53	31.2	117	68.8	
Quality of sleep															
Enough	43	19.9	173	80.1	<.001	23	24.7	70	75.3	<.001	20	16.4	102	83.6	<.001
Not enough	71	54.6	59	45.4		30	60.0	20	40.0		40	50.6	39	49.4	
Socioeconomic factors															
Help-seeking behaviors															
Many	44	21.1	165	78.9	<.001	14	20.6	54	79.4	<.001	29	20.9	110	79.1	<.001
Few	67	50.4	66	49.6		37	51.4	35	48.6		30	49.2	31	50.8	
Social capital															
High social capital	42	25.6	122	74.4	.004	20	29.4	48	70.6	.076	22	22.9	74	77.1	.032
Low social capital	71	40.1	106	59.9		32	43.8	41	56.2		38	36.9	65	63.1	
Frequency of participation															
Often	24	24.5	74	75.5	.029	14	24.6	43	75.4	.013	10	24.4	31	75.6	.355
Rarely	89	36.8	153	63.2		38	45.2	46	54.8		50	31.8	107	68.2	
Positiveness of participation															
Positive	31	27.0	84	73.0	.071	16	26.7	44	73.3	.025	15	27.3	40	72.7	.565
Negative	83	36.7	143	63.3		37	45.1	45	54.9		45	31.5	98	68.5	
Hobbies															
Hobbies	36	19.5	149	80.5	<.001	15	20.8	57	79.2	<.001	20	17.9	92	82.1	<.001
No hobbies	77	49.4	79	50.6		37	53.6	32	46.4		40	46.0	47	54.0	
Subjective economic conditions															
Comfortable	48	24.9	145	75.1	<.001	23	31.1	51	68.9	.094	25	21.0	94	79.0	.001
Uncomfortable	66	44.3	83	55.7		30	44.8	37	55.2		35	43.2	46	56.8	

* Fisher exact test.

such as frequency of participation in local activities and social capital. However, no significant associations were found in the multivariate analysis to support this hypothesis. Similar to in the individualistic cultural background of Western countries, the present study demonstrated that the promotion and evaluation of preventive measures for depression in Eastern culture that focus on individual behavioral and psychological factors.

4.2. Relationships between depression and each measured factor

The present study explored the relationship between depression and several variables in middle-aged residents in rural Japan and

found many psychological factors, health-related behaviors, and socioeconomic factors were significantly related to depression. There was significant relationship between living alone and depression in male, which is consistent with a previous study.^[20] Japanese middle-aged male tend to focus on relationships at work, but often have weak relationships in other aspects of their lives, such as their residential community. As a result, male who live alone tend to have difficulty obtaining support; therefore, living alone is associated with depression. To prevent depression among middle-aged people within the community, it is important to work with male who live alone.

There was no significant association between depression and type A behavior pattern, which is supported by some previous

Table 2
Logistic regression analysis for identifying comprehensive relationships between depression and its related factors.

Variable	OR	95%CI	P
Demographic characteristics			
Age (yr)	1.00	0.95, 1.06	.923
Gender			
Male(1)/Female(0)	2.02	1.01, 4.05	.048
Psychological factors			
Sense of coherence (SOC)			
High SOC (1)/Low SOC (0)	0.33	0.17, 0.64	.001
Life events			
Many life events (1)/Few life events (0)	1.38	0.69, 2.75	.365
Cognitive stress			
High stress (1)/Low stress (0)	4.44	1.83, 10.73	.001
Sense of stress control			
High stress control (1)/Low stress control (0)	0.72	0.31, 1.67	.441
Stress management skill			
Acquisition (1)/Non-acquisition (0)	0.56	0.26, 1.23	.147
Stress management			
Practice (1)/No practice (0)	1.15	0.53, 2.54	.722
Health-related behaviors			
Exercise			
High exercise (1)/Low exercise (0)	1.31	0.63, 2.72	.465
Quality of sleep			
Enough (1)/Not enough (0)	0.28	0.15, 0.53	<.001
Socioeconomic factors			
Help-seeking behaviors			
Many (1)/Few (0)	0.40	0.20, 0.77	.007
Social capital			
High social capital (1)/Low social capital (0)	0.73	0.38, 1.40	.345
Frequency of participation			
Often (1)/Rarely (0)	0.46	0.21, 1.00	.050
Hobbies			
Hobbies (1)/No hobbies (0)	0.30	0.16, 0.59	<.001
Subjective economic conditions			
Comfortable (1)/Uncomfortable (0)	0.67	0.35, 1.26	.211

95% CI = 95% confidence interval, OR = odds ratio.

results.^[21] However, 1 previous study did find a significant relationship between depression and type A behavior pattern,^[22] demonstrating that there is currently no consensus about this relationship.

However, there was a significant relationship between depression and SOC. This result was consistent with a previous study.^[23] Furthermore, there was a significant relationship between depression and number of life events and subjective stress, thus indicating the need to limit the effects of stressors on mental health. As SOC neutralizes these effects,^[24] improved SOC could be an effective preventive measure to decrease the negative effects of stressors on mental health. In addition, there were significant relationships between depression and sense of stress control, acquisition of stress management skills, and stress management practice. Being able to cope with stress is related to high manageability of SOC sub-concepts. This suggests that conducting stress management education may lead to an increase in SOC, thus serving as an effective preventive measure against depression.

Depression was significantly associated with exercise frequency and sleep quality, which was consistent with previous studies.^[25,26] When considering measures to combat depression, in addition to increasing exercise frequency, improving sleep quality matters more than increasing sleep duration. The relationship between depression and alcohol consumption was rejected in a long-term

cohort study,^[27] which was consistent with the results of this study. The relationship between smoking and depression is less clear, as previous studies have both supported^[28] and denied^[10] the association between smoking and depression. In present study, no significant relationship was found between depression and cigarette smoking. Thus, for middle-aged people in Japan, exercise frequency and sleep quality were shown to be the important behavioral factors related to depression.

Depression was significantly associated with not having a hobby. Previous research on Japanese workers has shown that a combination of distraction and problem-focused coping reduces stress responses.^[29] Distractions include having a hobby, which is considered to be an important stress-coping method. Thus, hobbies may be able to help prevent depression.

In male, depression was significantly associated with a lack of participation in community activities, while a previous study demonstrated that community support can prevent depression.^[30] Insufficient participation in community activities indicates a lack of involvement with local residents, which may make it difficult to obtain necessary social support.

4.3. Comprehensive association of factors related to depression

It was thought that factors related to residents' connection with their local communities would be strongly related to depression in Japan; however, personal behavioral factors were found to be more strongly associated with depression, which is consistent with previous studies in Western countries.^[31–33] In recent years, individualism has been introduced to Japan,^[34] which has given momentum to the call for work-life balance and placing value on individual life choices. In human relationships, traditional kinship, or neighborhood relationship are weakening. This may explain why the results of this study are consistent with previous studies conducted in Western countries, as attitudes and values in Japan have recently become more Westernized. It is possible to make use of the items found to be related to depression in this study, to narrow down the targets of depression prevention measures, and to give priority to support.

The results of this study revealed that individual behavioral factors, such as proper sleep habits and stress coping skills, are important preventative factors for depression. Further, the findings indicated the validity of promoting existing measures to prevent depression among middle-aged residents in Japan, such as providing interventions for reconstructing stress-sensitive cognition,^[35] encouraging help-seeking behavior,^[36] and improving sleep quality.^[37] However, it is difficult to promote these interventions in the community because they can be burdensome for busy middle-aged people. For example, previous studies that implemented interventions based on cognitive behavioral therapy to reduce stress consisted of 2 hours of group education and 3 months of web-based homework.^[35] For the general, healthy population, attending a group health education class and continuing homework for 3 months would likely be too burdensome to complete the program. Furthermore, while intervention programs to improve SOC are being developed, the current programs still lack sufficient evidence regarding their effectiveness.

Interventions that encourage hobbies are easy for individuals to participate in. To have a hobby is to have personal enjoyment, and hobbies can generally be performed without creating a burden. In a previous study that examined the differences

between how Easterners and Westerners perceived the causes and risk factors of depression, Japanese people were more likely to attribute personal weakness to depression.^[38] From this viewpoint, Japanese people tends to think that depression prevention requires individual effort to overcome weakness. Therefore, it is important to educate people that depression is not due to personal weakness, and that too much exertion can instead lead to depression. In addition, individuals need to be able to find what is enjoyable for them and have the time to do so. Having time for self-reflection may influence the relationship between having a hobby and depression. Thus, health education also includes taking the time to discover what you enjoy. After that, encourage people to have enjoyable time. As a specific method of health education, it may be possible for government organization to create and distribute a pamphlet focusing on individual behavior change. In addition to encouraging hobbies, this pamphlet should include knowledge and skills regarding stress control and proper sleep habits, which the findings of this study showed to be associated with depression.

However, it is well-known that people with lower incomes and less education are less likely to have hobbies.^[39] Thus, hobbies may have an economic and educational burden. Previous research has shown that cultural activities provided by a company can improve employees' mental health.^[40] Providing club activities as part of a well-being program could be a company effort to improve the mental health of employees and reduce the financial burden of a hobby. Furthermore, by belonging to groups outside of their work department, people can establish additional personal connections and various support networks. Working on reducing stressors by using multiple types of support is considered to be a problem-focused coping method. As Japanese society traditionally values group connections, there is a culture of group members helping each other in Japan. Thus, encouraging participation in hobbies with others would be an appropriate Japanese-style stress coping method that would utilizes the characteristics of Japanese culture.

However, the results of this study also validate promotion of measures to prevent depression that focus on personal behavioral and psychological factors in Japan, similar to countries with individualistic cultural backgrounds. Community-based hobbies may incorporate traditional kinship or neighborhood relationships. Furthermore, as some individuals, such as introverts, are often hesitant to interact with others, public activities are not suitable for everyone. It is therefore necessary to provide various opportunities according to each individual's situation and preferences, such as activities that are not community based or that can be performed alone.

There are several limitations to this study. First, the study was conducted in 1 municipality, and the results may not be generalizable. Second, the design was cross-sectional; thus, causal relationships between factors cannot be determined. Third, the analysis was performed without considering depression severity among participants. Therefore, it is possible that related factors may vary depending on depression severity. In future studies, factors associated with the severity of depression may need to be considered. Despite these limitations, this study recruited participants from all residents aged 40 to 59 in a municipality, and it is one of few studies that has comprehensively examined factors related to depression among middle-aged residents in Japan. In future research, the causal relationships between depression and related factors should be investigated using a longitudinal study design.

5. Conclusion

The present study comprehensively explored depression-related factors among middle-aged residents in Japan, which has a holistic cultural background. Given this cultural background, depression was expected to be strongly related to community factors; however, depression was primarily associated with personal behavioral and psychological factors, as shown in a multivariate analysis. These results are consistent with those reported in Western countries. Thus, this study can contribute the promotion and evaluation of preventive measures for depression in Eastern culture that focus on individual behavioral and psychological factors.

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