Oringal Articles

Reasons for Suicidal Ideation and Suicide Attempts during the COVID-19 Pandemic in Japan

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Abstract: ***Background:*** In Japan, the number of suicides increased rapidly during the COVID-19 pandemic. An investigation into the reasons for suicide was reported based on the official data based on information collected by the police. However, no studies have examined the reasons for suicide during the pandemic in Japan from a cross-sectional and longitudinal perspective based on the statements of individuals. ***Aims:*** Using the statements of people who experienced suicidal ideation or suicide attempts during the pandemic, we aimed to clarify (1) their reasons and (2) the reasons in overlapping cases that had reasons prior to the pandemic and developed reasons during the pandemic and in pandemic-emerging cases with only reasons that arose during the pandemic. ***Methods:*** An online survey obtained responses about 752 consultees involving suicidal ideation or suicide attempts during the pandemic from mental health and welfare professionals. Reasons were analyzed based on public suicide statistics categories for Japan. ***Results:*** (1) The many reasons for consultees included economy, health, and loneliness. (2) Health and family were the most frequent pre-pandemic reasons in overlapping cases. Economy followed by loneliness were frequent reasons that arose during the pandemic both in overlapping cases and pandemic-emerging cases. The reasons arising during the pandemic did not differ between the two groups. ***Conclusion:*** The results of the present study, based on statements from the individual people involved, may be closer to reality and show a stronger and more pervasive impact of the reasons than results based on data from suicide deaths. These results indicate that prevention of suicide requires economic and mental health welfare measures during a pandemic, in coordination with pre-pandemic mental health welfare measures.

Keywords: suicidal ideation, suicide attempt, reason, COVID-19, pandemic.

(Journal of Suicidology 2023; 18(4): 763-772. DOI:10.30126/JoS.202312_18(4).0008)

Introduction

The coronavirus disease 2019 (COVID-19) pandemic that started in January 2020 had a massive impact worldwide on mortality, economics, healthcare, relationships, and mental health [1]. In May 2023, the World Health Organization announced that COVID-19 no longer constitutes a public health emergency of international concern and Japan relaxed its infection control regulations. Nevertheless, the impacts of the pandemic are expected to continue for many years, and there are certain to be outbreaks and pandemics of infectious diseases from known or unknown microorganisms in the future as well [2]. We therefore need to continue to accumulate pandemic-related knowledge and apply it to ongoing and future measures.

Despite suicide being one major mental health problem arising during the COVID-19 pandemic, many countries did not show a clear rise in the number of suicides in pre- versus early pandemic comparisons or comparisons of early pandemic versus one year into the pandemic [3, 4]. In Japan, the number of suicides that had been decreasing since 2010 began increasing again in 2020 [5]. Multiple studies have been carried out on characteristics such as sex, age, and occupation in this rise in numbers using public suicide statistics from the Japanese National Police Agency [6-8]. Koda et al. [9] used that public data to show the reasons for suicide. However, the types of reasons in public data are based on information collected by the police [5], and the reasons are not reported by the people who died by suicide, creating a limitation to studies based on such data [9]. Statements from individual people experiencing suicidal ideation or who have attempted suicide can provide useful supplementary data. No studies to date have examined the reasons for suicide based on the statements of people who experienced suicidal ideation or suicide attempts during the pandemic in Japan.

Furthermore, stress factors related to the pandemic can exacerbate existing mental health problems [10] or create new problems in people who did not have them before [11]. This suggests that people who died by suicide during the pandemic may be a mix of two types of cases: those who experienced a combination of reasons from prior to the pandemic and reasons arising during the pandemic that led to suicidal ideation or a suicide attempt (overlapping cases) and those who had

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Received: 27 December 2023; **Accepted:** 15 January 2024.

only reasons arising during the pandemic (pandemic-emerging cases). Although Koda et al. [9] conducted a cross-sectional study during the pandemic on reasons for deaths by suicide, clarification of the above point requires a longitudinal examination of the situation before and during the pandemic.

We therefore aimed to clarify (1) the reasons for suicidal ideation or suicide attempts during the pandemic and (2) the reasons that existed prior to the pandemic in overlapping cases and the reasons arising during the pandemic in overlapping cases and pandemic-emerging cases based on the statements of people who experienced suicidal ideation or suicide attempts during the pandemic.

Methods

Procedure

This survey was conducted online from May to August 2021 in Japan. In that period, in accordance with the national government's declaration of a state of emergency, the activities of shops, businesses, schools, and other institutions were restricted. The healthcare system was severely overwhelmed, and patients who were not eligible for inpatient care were asked to recuperate at home or in a hotel. The vaccination rate for the first dose was still low, and many people avoided going out unless necessary [12, 13]. The survey was given to mental health and welfare professionals who belong to the Japanese Association of Psychiatric Hospitals (1,118 members), the Japanese Association of Neuro-Psychiatric Clinics (1,639 members), and the Federation of Inochi No Denwa telephone counseling service. Participants who provided consent online to participate in the survey were shown the survey webpage. Responses were anonymous, and no information with personal identifiers was collected. The study was approved by the Teikyo University (No. 21-012) and University of Tsukuba (No. 1668-1) ethics committees.

Subjects and variables of analysis

Survey questions were (1) if they received any consultations about suicidal ideation or suicide attempts during the pandemic, (2) the number of consultees, (3) effective response methods, and (4) information about up to three most noteworthy consultees, including their sex and age, as well as an open-ended part for consultation details and reasons. In this study, 'suicidal ideation or suicide attempts arising during the pandemic' was defined as suicidal ideation or suicide attempts triggered by a problem that arose during the pandemic after January 2020.

Responses were received from 466 professionals. For this study, only the responses concerning consultations from question (4) were used as data for analysis, and analysis was performed on 752 consultees with no missing values.

The analyzed variables were the consultee's sex, age (10 to 39 years, 40 to 59 years, 60 years or older), and responses in the open-ended part. First, evaluators extracted the reasons for suicidal ideation or suicide attempts from the open-ended part for each consultee. Then, following Koda et al. [9], the reasons were grouped into 52 subcategories under seven categories for reasons for deaths by suicide used in the National Police Agency suicide statistics [5], as shown in Table 1.

Next, regarding the time period when the reason arose for the consultee, evaluators divided reasons into ones that could be determined to have existed prior to the pandemic and ones that could be determined to have arisen during the pandemic, and they grouped consultees into the overlapping group and the pandemic-emerging group. Overlapping cases had both reasons determined to have existed prior to the pandemic and reasons determined to have arisen during the pandemic, while the pandemic-emerging group had only reasons determined to have arisen during the pandemic.

Consultees were grouped independently by two evaluators, and discrepancies were resolved through discussion.

Data analysis

The frequency and occurrence rate were examined using descriptive statistics for categories and subcategories of reasons for all subjects, pre-pandemic reasons in overlapping cases, and pandemic-emerging reasons in overlapping cases and pandemic-emerging cases. When calculating the frequency of each reason, if there was more than one reason in a single consultee, each reason was counted as one case to find the cumulative total.

Chi-square tests were used to examine differences in occurrence rate in categories of reasons between sexes and age groups for all consultees, in pre-pandemic and pandemic-emerging reasons between them for the overlapping group, in pandemic-emerging reasons between them for the pandemic-emerging group, and in pandemic-emerging reasons between the overlapping and pandemic-emerging groups. To find clear trends, categories with an occurrence rate below 5% were removed from the analysis. If cells with an expected value of less than 5 exceeded 20% of all cells, the p-value was calculated using Fisher's exact test. All statistical analyses were performed using IBM SPSS version 28.0.

Results

After dividing consultees into categories, analysis was performed on 675 cases excluding 77 whose reasons were unknown.

Analysis of all consultees

Of all consultees, 322 were men (47.7%) and 353 were women (52.3%). For age, 249 were aged 10 to 39 years (36.9%), 338 were aged 40 to 59 years (50.1%), and 88 were aged 60 years or older (13.0%).

The number of reasons per consultee was 1.85±0.92. In total, there were 1,300 consultees after dividing by reason. The frequencies and occurrence rates for each reason are shown in Table 1.

Among categories, the occurrence rate was highest for the economy (36.2%), with poverty and unemployment subcategories accounting for 70.2%.

The second-highest category was health(21.7%), with "other mental disorders" and "others (health)" accounting for 61.0%. We placed strong fear and anxiety about COVID-19 infection in the subcategory of "other mental disorders", and that reason accounted for 20.7% of the subcategory. In addition, the main reasons in the subcategory of "others (health)" were stress from activity restriction, a sense of burden from infection control work, and difficulty receiving outpatient care and exacerbation of existing physical conditions because of activity restrictions or financial problems. The third-highest category was others(18.8%), with loneliness accounting for 79.1%. Loneliness was the most frequent reason in all 52 subcategories.

After removing relationships and school, which had occurrence rates of less than 5%, the occurrence rates of categories were examined for age and sex differences (Table 1). A significant sex difference was observed ($\chi 2(4) = 57.8$, $p<.01$), with significantly higher occurrence rates of family and health for women (family: $Z=4.9$, health: $Z=2.9$, $p<.01$ for both) and significantly higher occurrence rate of economy for men ($Z=6.5$, $p<.01$). Reasons also differed by age ($\chi 2(8) = 24.2$, $p<.01$), with significantly higher occurrence rates of health and others among those aged 60 or older (health: $Z=2.0$, others: $Z=2.2$, $p<.05$ for both).

Analysis of the overlapping and pandemic-emerging groups

Of the 675 consultees, 108 (16.0%) were in the overlapping group and 567 (84.0%) were in the pandemic-emerging group.

In the overlapping group, 52 were men (48.1%) and 56 were women (51.9%). For age, 33 were aged 10 to 39 years (30.6%), 59 were aged 40 to 59 years (54.6%), and 16 were aged 60 years or older (14.8%).

The number of pre-pandemic reasons in overlapping cases was 1.12±0.35 per person. After grouping by reason, there were 121 cases in total. The frequency and occurrence rate of pre-pandemic reasons for suicide ideation or suicide attempt in the overlapping group are shown in Table 2. The occurrence rate was highest for the health category (69.4%: 84 cases), followed by family (19.0%: 23 cases).

After removing work, relationships and School, which had occurrence rates of less than 5%, the occurrence rates of categories of pre-pandemic reasons in the overlapping group were examined for age and sex differences (Table 2). A significant sex difference was observed ($\chi 2(3) = 10.8$, $p<.01$), with significantly higher occurrence rates of family for women ($Z=3.2$, $p<.01$) and significantly higher occurrence rate of economy for men ($Z=2.0$, $p<.05$). No significant differences for age were observed.

The number of pandemic-emerging reasons in overlapping cases was 1.49±0.63 per person. After grouping by reason, there were 161 cases in total. The frequency and occurrence rate of pandemic-emerging reasons in the overlapping group are shown in Table 2. The occurrence rate was highest for the economy category (36.0%: 58 cases), followed in descending order by others (21.7%: 35 cases), family (19.9%: 32 cases), health (16.1%: 26 cases), work (5.6%: 9 cases), relationships (0.6%: 1 case), and school (0.0%: 0 cases).

After removing relationships and School, which had occurrence rates of less than 5%, the occurrence rates of categories of pandemic-emerging reasons in the overlapping group were examined for age and sex differences (Table 2). No significant differences for sex and age were observed.

Within the overlapping group, the pre-pandemic reason and pandemic-emerging reason were the same in 35 cases (32.4%) and different in 73 cases (67.6%).

In the pandemic-emerging group, 270 were men (47.6%) and 297 were women (52.4%). For age, 216 were aged 10 to 39 years (38.1%), 279 were aged 40 to 59 years (49.2%), and 72 were aged 60 years or older (12.7%).

The number of pandemic-emerging reasons in pandemic-emerging cases was 1.80±0.89 per person. After grouping by reason, there were 1,018 cases in total. The frequency and occurrence rate of pandemic-emerging reasons for suicide ideation or suicide attempt in the pandemic-emerging group are shown in Table 2. The occurrence rate was highest for the economy category (39.9%: 406 cases), followed in descending order by others (19.8%: 202 cases), health (16.9%: 172 cases), family (13.6%: 138 cases), work (7.1%: 72 cases), school (2.4%: 24 cases), and relationships (0.4%: 4 cases).

After removing relationships and School, which had occurrence rates of less than 5%, the occurrence rates of categories of pandemic-emerging reasons in the pandemic-emerging group were examined for age and sex differences (Table 2). A significant sex difference was observed ($\chi 2(4) = 47.9$, $p<.01$), with significantly higher occurrence rates of family, health and others for women (family: $Z=3.6$, health: $Z=3.4$, $p<.01$ for both, others: $Z=2.0$, $p<.05$) and significantly higher occurrence rate of economy for men ($Z=6.2$, $p<.01$). Reasons also differed by age ($\chi 2(8) = 25.0$, $p<.01$), with significantly higher occurrence rates of family among those aged 40 to 59 ($Z=2.1$, $p<.05$) , health and others among those aged 60 or older (health: $Z=2.5$, others: $Z=2.0$, $p<.05$ for both).

Lastly, after removing relationships and school, which had occurrence rates of less than 5%, no significant group differences were observed in occurrence rates in categories of pandemic-emerging reasons (Table 2).

Table 1. Total number of people by reason for suicidal ideation or suicide attempt during the COVID-19 pandemic in all consultees.

	Total		Sex				Age group					
			Men		Women		10-39y		40-59y		Over 60y	
	(N=1300)		(N=658)		(N=642)		(N=476)		(N=678)		(N=146)	
	n	%	n	%	n	%	n	%	n	%	n	%
Family	193	14.8	66	10.0	**127****	**19.8**	56	11.8	113	16.7	24	16.4
Parent-child problems	19		5		14		10		9		0	
Marital discord	49		18		31		11		31		7	
Other family discord	35		17		18		5		27		3	
Death of family member	19		5		14		1		13		5	
Pessimism about the future of the family	4		2		2		1		3		0	
Abuse from family	1		0		1		1		0		0	
Child-rearing problems	8		0		8		4		4		0	
Abuse	11		1		10		9		2		0	
Caregiving fatigue	17		5		12		2		9		6	
Others (family)	30		13		17		12		15		3	
Health	282	21.7	121	18.4	**161****	**25.1**	106	22.3	134	19.8	**42***	**28.8**
Physical illness	31		12		19		7		19		5	
Depression	50		23		27		16		26		8	
Schizophrenia	10		6		4		6		4		0	
Alcoholism	4		3		1		3		1		0	
Drug and substance abuse	9		0		9		9		0		0	
Other mental disorders	111		49		62		43		54		14	
Physical disability	6		4		2		2		2		2	
Others (health)	61		24		37		20		28		13	
Economy	470	36.2	**294****	**44.7**	176	27.4	178	37.4	255	37.6	37	25.3
Bankruptcy	16		12		4		3		10		3	
Business slump	14		9		5		3		8		3	
Unemployment	163		108		55		62		92		9	
Job failure	61		43		18		24		34		3	
Poverty	167		96		71		60		93		14	
Multiple debts	1		0		1		0		1		0	
Joint guarantee	0		0		0		0		0		0	
Other debts	9		9		0		4		5		0	
Debt collection trouble	1		1		0		0		0		1	
Suicide for insurance	4		4		0		1		3		0	
Others (economy)	34		12		22		21		9		4	

Table 1 (cont'd). Total number of people by reason for suicidal ideation or suicide attempt during the COVID-19 pandemic in all consultees.

	Total		Sex				Age group					
			Men		Women		10-39y		40-59y		Over 60y	
	(N=1300)		(N=658)		(N=642)		(N=476)		(N=678)		(N=146)	
	n	%	n	%	n	%	n	%	n	%	n	%
Work	82	6.3	48	7.3	34	5.3	36	7.6	41	6.0	5	3.4
Work failure	1		1		0		0		1		0	
Workplace relationships	16		9		7		6		10		0	
Work environment changes	20		12		8		7		11		2	
Work fatigue	14		10		4		7		6		1	
Others (work)	31		16		15		16		13		2	
Relationships	5	0.4	3	0.5	2	0.3	3	0.6	2	0.3	0	0.0
Marriage	1		1		0		0		1		0	
Heartbreak	2		1		1		2		0		0	
Infidelity	1		1		0		1		0		0	
Other relationship distress	1		0		1		0		1		0	
Others (relationships)	0		0		0		0		0		0	
School	24	1.8	12	1.8	12	1.9	24	5.0	0	0.0	0	0.0
Admissions	0		0		0		0		0		0	
Academic path	1		1		0		1		0		0	
Academic failure	3		2		1		3		0		0	
Issues with teachers	0		0		0		0		0		0	
Bullying	1		1		0		1		0		0	
Schoolmate trouble	1		1		0		1		0		0	
Others (school)	18		7		11		18		0		0	
Others	244	18.8	114	17.3	130	20.2	73	15.3	133	19.6	**38****	**26.0**
Discovery of a crime	1		1		0		1		0		0	
Victim of a crime	0		0		0		0		0		0	
Copycat suicide	17		3		14		8		8		1	
Loneliness	193		96		97		52		108		33	
Neighborhood trouble	4		1		3		0		3		1	
Others (others)	29		13		16		12		14		3	
p Value (x-square test)				p<.01						p<.01		

Notes: Percentages are shown with respect to the total number of people of that sex or age group.
p-values are by an x-square test (except for Relationships and School).
Bold numbers indicate occurrence rate over expected values based on residual analysis.
** p<.01 * p<.05.

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Table 2. Frequency and occurrence rate of reasons for suicide ideation or suicide attempts existing prior to the pandemic in overlaping group, and arising during the pandemic in overlapping and pandemic-emergimg groups.

	Reasons that existed prior to the pandemic in overlapping group											
	Total		Sex				Age group					
			Men		Women		10-39y		40-59y		Over 60y	
	(N=121)		(N=58)		(N=63)		(N=35)		(N=70)		(N=16)	
	n	%	n	%	n	%	n	%	n	%	n	%
Family	23	19.0	4	6.9	**19****	**30.2**	7	20.0	12	17.1	4	25.0
Health	84	69.4	**45***	**77.6**	39	61.9	27	77.1	47	67.1	10	62.5
Economy	6	5.0	4	6.9	2	3.2	1	2.9	4	5.7	1	6.3
Work	1	0.8	1	1.7	0	0.0	0	0.0	1	1.4	0	0.0
Relationships	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
School	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Others	7	5.8	4	6.9	3	4.8	0	0.0	6	8.6	1	6.3
p Value (χ-square test)$^{+}$				p<.01						N.S.		

Note: Percentages are shown with respect to the total number of people of that sex or age group.
p-values are by an χ-square test (except for categories with an occurrence rate below 5%).
Bold numbers indicate occurrence rate over expected values based on residual analysis. ** p<.01 * p<.05.
p Value (χ-square test)$^{+}$ =The test is using Fisher's exact test except for work, relationships and school.

Table 2 (cont'd). Frequency and occurrence rate of reasons for suicide ideation or suicide attempts existing prior to the pandemic in overlaping group,and arising during the pandemic in overlapping and pandemic-emergimg groups.groups.

	Reasons that arose during the pandemic																							
	Overlapping group												Pandemic-emerging group											
	Total		Sex				Age group						Total		Sex				Age group					
			Men		Women		10-39y		40-59y		Over 60y				Men		Women		10-39y		40-59y		Over 60y	
	(N=161)		(N=77)		(N=84)		(N=46)		(N=93)		(N=22)		(N=1018)		(N=523)		(N=495)		(N=395)		(N=515)		(N=108)	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Family	32	19.9	11	14.3	21	25.0	10	21.7	18	19.4	4	18.2	138	13.6	51	9.8	**87****	**17.6**	39	9.9	**83***	**16.1**	16	14.8
Health	26	16.1	8	10.4	18	21.4	10	21.7	12	12.9	4	18.2	172	16.9	68	13.0	**104****	**21.0**	69	17.5	75	14.6	**28***	**25.9**
Economy	58	36.0	34	44.2	24	28.6	19	41.3	32	34.4	7	31.8	406	39.9	**256****	**48.9**	150	30.3	158	40.0	219	42.5	29	26.9
Work	9	5.6	5	6.5	4	4.8	2	4.3	7	7.5	0	0.0	72	7.1	42	8.0	30	6.1	34	8.6	33	6.4	5	4.6
Relationships	1	0.6	0	0.0	1	1.2	0	0.0	1	1.1	0	0.0	4	0.4	3	0.5	1	0.2	3	0.8	1	0.2	0	0.0
School	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	24	2.4	12	2.3	12	2.4	24	6.1	0	0.0	0	0.0
Others	35	21.7	19	24.7	16	19.0	5	10.9	23	24.7	7	31.8	202	19.8	91	17.4	**111****	**22.4**	68	17.2	104	20.2	**30***	**27.8**
p Value (χ-square test)+				N.S.				N.S.								p<.01						p<.01		
														N.S.										

Note: Percentages are shown with respect to the total number of people of that sex or age group.
p-values are by an χ-square test (except for categories with an occurrence rate below 5%).
Bold numbers indicate occurrence rate over expected values based on residual analysis. ** p<.01 * p<.05.
p Value (χ-square test)+ = The test is except for relationships and school.

Discussion

Reasons for suicidal ideation and suicide attempts during the pandemic

To our knowledge, this is the only study that has examined the reasons for suicidal ideation and suicide attempts during the pandemic in Japan based on the statements of the individuals.

Subjects had one to three reasons for suicidal ideation or suicide attempts during the pandemic, and the most frequent reason was economy (primarily unemployment or poverty). Horita and Moriguchi. [7] found a relationship between suicide rate and unemployment rate that rose during the pandemic in Japan due to employer or work circumstances [14]. We also confirmed unemployment and poverty to be important suicide risk factors during the pandemic in the present study. To explain the greater frequency of these reasons among men, Japan has a higher gender gap in employment rate compared to other countries, with about half of women working non-regular jobs [15]. The economic impact may therefore have been greater for men working full-time who were the main breadwinners for their family. Koda et al. [9] studied the reasons for deaths by suicide during the pandemic and found that the excess suicide rate from economy was lowest of all the seven categories, a different finding from the results of the present study. Background factors causing this difference may have been not only the difference of survey periods, but also the different type of information source used for categorizing reasons. The information source for categorizing reasons for deaths by suicide from public data is information collected by the police, while the source in the present study was the people who experienced suicidal ideation or attempted suicide themselves. While caution should be used when comparing excess suicide rate and occurrence rate, our finding that economic difficulty during the pandemic was a reason leading to suicide risk for many people may be more in line with reality.

The second most frequent reason was health, which was especially frequent among women and older people. This result is similar to the finding by Koda et al.[9] that the excess suicide rate was highest for health and was particularly high for women in this category. The difference between the two studies is the subcategories. In the study by Koda et al. [9], the main subcategories with a high excess suicide rate among the people who died by suicide were physical illness and physical disability for men and depression, schizophrenia and alcoholism for women. The latter three mental disorders are already known suicide risk factors [16]. However, the subcategories in the present study that were the most frequent reasons for suicidal ideation or suicide attempts were “other mental disorders” and “others (health)”, and 20% of those who gave “other mental disorders” as a reason complained of a strong fear of or anxiety about COVID-19 infection. In other words, this indicates that 80% of subjects developed or experienced an intensification of a mental disorder other than depression, alcoholism, or schizophrenia as an indirect result of the pandemic. This indirect impact widely contributed to poor mental and physical health is also backed by the finding that the main reasons in the subcategory of “others (health)” were stress from activity restriction, a sense of burden from infection control work, and exacerbation of existing physical conditions due to difficulty receiving outpatient care. This result suggests that the indirect impact of the pandemic contributed widely through various mental disorders and poor mental and physical health and may have also increased the suicide risk.

The third most frequent reason was others (especially loneliness). This is in agreement with the fact that loneliness is a known suicide risk factor due to a weakened sense of belonging [17], and the finding that loneliness during the pandemic in Japan was strongly associated with suicidal ideation [18]. The Japanese government called for people to maintain social distance to prevent infection, and loneliness from the resulting drop in socialization may have been a major suicide risk factor during the pandemic. To explain the greater frequency of these reasons among older people, the rate of developing severe COVID and the COVID mortality rate were especially high among the older population [19], and the ratio of older adults living alone is increasing in Japan [20]. Older people living alone whose activities were being carefully restricted may have felt a heightened sense of loneliness. In data on suicide deaths by Koda et al. [9], the excess suicide rate was fourth highest in the others category, and the loneliness subcategory of others was only high for men, not exceeding expected values for women. The others category was the third most frequent in the present study on suicidal ideation and suicide attempts. Within that category, the subcategory of loneliness was the most frequent reason for all consultees together for women and the second most frequent for men. The different sources of information used in the two studies may also have contributed to this different result. Our findings, which are based on statements from the individual people themselves, suggest that loneliness may have been more intense during the pandemic or may have been a factor that increased the suicide risk for more people, both men and women.

Reasons that existed prior to the pandemic and reasons that emerged during the pandemic

The present study also examined, from a longitudinal perspective, the reasons that existed prior to the pandemic and the reasons that emerged during the pandemic.

Many consultees in the overlapping group had health or family problems that had begun prior to the pandemic. This is in agreement with the fact that mental disorders and relationship conflict, discord, or loss are known suicide risk factors [16], and the finding that health was the most frequent reason and family the third most frequent reason for suicide prior to the pandemic in Japan [21]. Health was especially frequent among men, and family was among women. The former is in agreement with the trends in public suicide statistics from the Japanese National Police Agency prior to the pandemic [21]. The latter, however, is not in agreement with it. This discrepancy may also be due to the different type of information source. In the overlapping group, these pre-pandemic problems may have been preparatory

factors that, combined with reasons described below, emerged during the pandemic, increasing the suicide risk.

The most frequent reasons that emerged during the pandemic in the overlapping group were economy, others, family and health, in that order. No significant differences for sex and age were observed. The most frequent reasons that emerged during the pandemic in the pandemic-emerging group were economy, others, health and family, in that order. In the pandemic-emerging group, economy was especially frequent among men, others and health were among women and older people and family was among women and middle-aged people. These results are similar to the results in all consultees in the present study. Horita and Moriguchi [22] found a significant increase in deaths by suicide among women during the pandemic in Japan, suggesting that the loss of human contact, partly due to social lockdowns, might have had a more severe impact on women. The result that others (mainly loneliness) was especially frequent among women in the present study is in agreement with this. One possible reason for the greater frequency of family problems among middle-aged women is that they spend more time at home. About half of the Japanese women work as a non-regular employee [15]. In addition, spousal violence against women has increased due to the anxiety and stress of living with the spread of infection and the increase in time spent at home due to activity restriction [15].

The occurrence rate of reasons emerged during the pandemic did not differ between the overlapping and the pandemic-emerging groups, indicating that these are unique pandemic-caused reasons for both groups. In addition, the majority of subjects who experienced suicidal ideation or suicide attempts were in the pandemic-emerging group. In these cases, suicide risk was only increased by multiple reasons emerging during the pandemic. And in the overlapping group, about 68% had different categories of pre-pandemic reasons and pandemic-emerging reasons, suggesting that more people experienced the addition of new reasons during the pandemic than the exacerbation of a previously existing reason due to the pandemic. These show the intensity of the impact of the pandemic itself.

Limitations

Limitations of this study are as follows. (1) As only the cases that mental health and welfare professionals found most notable were used as data, analysis was only performed on a subset of suicidal ideation and suicide attempts. (2) Concerning pre-pandemic reasons (health, family) in the overlapping group, it should be noted that the analysis focused on people who consulted mental health and welfare professionals and who were likely to have been receiving mental health and welfare support prior to the pandemic. (3) In terms of the urgency of suicide risk, caution is needed in considering those with suicidal ideation or suicide attempts in the same group as those who die by suicide. (4) We did not compare the reasons for consultees who only had suicidal ideation with those who attempted suicide during the pandemic. This is because we asked participants to respond without separating the two in survey questions. These two should be considered separately in order to know more elaborate risk factors related to suicide. This is a subject for future research.

Conclusions

Recent systematic reviews [23, 24] have identified economic downturn, psychiatric vulnerabilities, isolation and quarantine, health concerns, and relationship difficulties as risk factors for suicidal behaviors in the COVID-19 pandemic. The novelty of our study is that it is based on the narratives of the individual people involved and that it compares factors that occurred prior and during the COVID-19 pandemic. The results of our study, based on statements from the individual people involved, may be closer to reality and show a stronger and more pervasive impact of the reasons than results based on official statistical data from suicide deaths. Specifically, the three main results were as follows. (1) The main reasons for suicidal ideation and suicide attempts during the COVID-19 pandemic in Japan were economy, health (especially mental disorders other than depression, alcoholism, or schizophrenia), and loneliness. (2) Many who had reasons (primarily concerning health or family) as preparatory factors prior to the pandemic developed additional and pandemic-caused reasons during the pandemic rather than the exacerbation of a previously existing reason due to the pandemic. (3) Suicide risk increased for many people due to multiple and unique pandemic-caused reasons (primarily concerning economy or loneliness) that emerged during the pandemic. The results suggest that to prevent suicide during pandemics, it is necessary to implement economic and mental health welfare measures and provide psychological support for loneliness during a pandemic, in coordination with pre-pandemic mental health welfare measures. The risk factors obtained in this study are consistent with meta-analyses in other countries [23, 24]. However, it is not sufficient to stop there. Knowledge of risk factors prior and during the COVID-19 pandemic will be an important step in considering suicide prevention measures in the future. The results of the present study may aid in the development of effective suicide prevention measures.

Declaration of competing interest

The authors have no conflicts of interest relevant to this article.

Acknowledgments

An earlier version of this paper was presented at the 46th Convention Japanese Association for Suicide Prevention (Kumamoto, Japan, September 2022). This study was conducted under the auspices of the Japanese Association for Suicide Prevention. We wish to thank the Japan Psychiatric Hospitals Association, the Japanese Association of Neuro-Psychiatric Clinics, and Inochi no Denwa for their valuable contributions to this study. The authors thank FORTE Science Communications (https://www.forte-science.co.jp/) for English language editing.

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