Understanding the Challenges Faced by Foreign Residents in Japan During the COVID-19 Pandemic

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1. Abstract

Background: This study investigates the unique challenges faced by foreign residents in Japan during the COVID-19 pandemic. With Japan's significant international community, understanding these challenges is vital. The primary objectives of this study were to explore the mental, behavioral, and financial differences encountered by foreign residents in comparison with Japanese nationals, and to determine the impact of these on their overall well-being and integration into Japanese society.

Methods: A secondary data analysis was carried out on a cross-sectional survey conducted from April to July 2022, which included data collected from both Japanese and non-Japanese residents. Descriptive statistics and non-parametric tests were used to compare the differences between the Japanese and non-Japanese responses across aspects of demographic, COVID-19-related behaviors, mental health status, trust in government, and financial impact.

Results: The study revealed significant demographic differences between Japanese and non-Japanese residents in terms of age, family structure, and vaccine preference. Notably, non-Japanese residents were younger (median age 33 vs. 42, $p= 0.004$) and had smaller family sizes (median 0.5 vs. 2, $p<0.001$) compared to their Japanese counterparts. Full vaccination rates were higher (92.9% vs. 86.9%) with a distinctive preference in Moderna vaccine being observed ($p=0.009$). Non-Japanese are significantly less afraid of COVID-19 than Japanese respondents (median score of 47 vs. 28, $p=0.049$). Furthermore, non-Japanese respondents were less likely to take advantage of home office arrangements (21.4% vs. 59.2%, $p=0.012$) and less likely to receive financial aid (42.9% vs. 79.1%, $p=0.004$) at the COVID-19 pandemic.

Conclusion: The findings underscore the necessity for tailored communication strategies and support systems for foreign residents in Japan, especially during crises such as a pandemic. Further studies to reveal the reasons for the identified differences are essential for fostering an inclusive environment that supports the well-being of all residents.

Keywords: COVID-19, Foreign Residents, Japan, Comparison, Cross-Cultural Challenges, Mental Health, Behavioral Impact, Financial Hardship

List of abbreviations

COVID-19	Coronavirus disease 2019

2. INTRODUCTION

2.1. The Significance of Emergency Response in Japan

Japan is susceptibility to natural and infectious disease disasters. Natural disasters, such as earthquakes, tsunamis, and volcanic eruptions are often occurred in Japan. Therefore, the need for advanced early warning systems, especially in tsunami-prone coastal areas, is vital for protecting densely populated regions and mitigating the impacts of such disasters.(1)

Furthermore, urban structural changes in Japan in recent decades highlight the intersection of seismic risks and urban planning. These changes present unique challenges in terms of disaster preparedness and risk management in Japan.(2) The psychological impact of disasters on populations is both profound and multifaceted. Understanding the broad-ranging impacts of natural disasters, encompassing economic, social, and psychological aspects, is crucial for comprehending the societal consequences of disasters in Japan.(3)

Recent studies centered on Japan offer significant insights into disaster resilience and mental health. These studies underscore the importance of social connections and disaster preparedness in mitigating psychological trauma, especially among aging populations and foreign residents. Therefore, understanding the long-term impact of disaster events on mental health is crucial for developing effective support systems for affected individuals.(4) Taking earthquake as an example, the Tōhoku Theater Project showcases the use of the arts in supporting, healing, and promoting resilience among disaster-affected individuals, providing an innovative approach to addressing community mental health in the context of disaster.(5)

Several studies have explored the concept of social trust and its relationship with health outcomes in disaster situations. The importance of social capital in fostering disaster resilience is emphasized, particularly in the context of older disaster survivors. Building and maintaining social trust can be a key factor in enhancing the resilience of communities to future disasters(6).

The evolution of Japan's disaster management policies, emphasizing the importance of building resilient communities, is a critical aspect of the country's response to disasters. These policies reflect the need for comprehensive strategies that address both the immediate and long-term impacts of disasters.(7)

Overall, Japan's approach to disaster management requires a comprehensive, many-sided strategy that addresses the complexities introduced by its changing demographics and increased vulnerability to natural disasters.

2.2. The Demographic Shift in Japan

The global population are dynamic and constantly evolving nowadays. Research indicates that the primary elements influencing these changes are mortality, fertility, and migration. Migration is a significant factor altering the population makeup in numerous countries, with rising migration levels notably affecting demographic trends and labor growth.(8) In Japan, these global trends are particularly impactful. The country faces unique demographic challenges recently, including an aging population and a changing migration pattern. Among which, the role of migration in shaping the future demographic landscape of Japan is a crucial aspect of this dynamic.

Understanding appropriate strategies to different communities in Japan is crucial for effective disaster response planning. It is essential to develop strategies that consider not only the unique needs of Japanese residents, but also those of non-Japanese residents. This diverse approach should incorporate insights from the best available literature on disaster resilience, mental health, and community support, ensuring that all residents, regardless of nationality, can effectively face the challenges posed by disasters and contribute to the resilience of the broader community. Understanding that the unique challenges faced by these non-Japanese residents extend beyond linguistic barriers, encompassing cultural and social aspects is critical in disaster response planning.

2.3. Challenges Faced by Foreigners in Japan during COVID-19

Both central and local governments have faced challenge with the outbreak of COVID-19 and other emerging infectious diseases in recent years. Among different emerging disease outbreaks, COVID-19 pandemic has impacted the country the most, requiring large-scale emergency response and long-term adjustments to control measures for the nationals. The cumulative number of confirmed COVID-19 cases in Japan stood at 33,793,429 as of May 7, 2023(9), the last date when data of notifiable disease surveillance was gathered.

As the country grapples with a pandemic affecting over a quarter of its population, it became evident in the early stages of the pandemic in 2020 that foreign residents in Japan were encountering difficulties in accessing accurate and timely information about COVID-19 responses in their native languages, categorizing them as a vulnerable group in terms of information accessibility. This situation generated anxiety and confusion among foreign nationals who were uncertain about the regulations and preventive measures necessary to protect themselves from infection and prevent regulatory infractions.

In the context of the COVID-19 pandemic, the impact on mental health has been significant and warrants attention in disaster response strategies. The vulnerabilities of foreign residents in Tokyo, specifically, emphasize the need for targeted evacuation procedures and disaster risk information dissemination. The pandemic has highlighted the necessity of equitable healthcare access and mental health support, especially during crises. This situation underscores the disparities that can be exacerbated in disaster situations and the need for inclusive healthcare strategies.

2.4. Objectives

The goal of this capstone was to explore challenges encountered by foreign residents in

Japan during the COVID-19 pandemic. Through secondary data analysis methods, we utilize data collected from a cross-sectional survey conducted from April to July 2022, which aimed to understand the Japanese online community's perspectives, beliefs, and expectations towards COVID-19 information. Our objective is to compare the mental, behavioral, and financial aspects between foreign residents and Japanese nationals who resided in Japan during the latter phase of the pandemic.

This project hypothesized that foreign residents have different pandemic experiences across the areas of mental, behavioral, and financial aspects compared with Japanese residents. By achieving the above-mentioned objective, this project can provide directions to the development of strategies to address the needs of foreign residents and foster a multi-cultural coexistence society in Japan.

3. METHODS

This study used secondary data from a cross-sectional survey conducted in April-July 2022, which had been approved by the St. Luks's International University Research Ethics Committee (Approval number 21-E002). The original survey was administrated to both Japanese and foreign nationals living in Japan as subjects. The data were collected by means of an online survey for the original COVID-19 information-seeking study.

3.1. Research subjects

3.1.1. Selection criteria

Subjects were online internet users who fulfilled all of the following criteria:

a) age of at least 20 years at the time of consent;

b) have given written consent to participate in this research (both the survey and interview parts required electronic endorsement from the subject); and

c) participants who live in Japan at the time of participation.

The target participants were not limited to Japanese people only. People who satisfied the above selection criteria became the target participants (i.e. they may include those who can or cannot understand the Japanese language (e.g. English speakers), and foreign nationals. The survey was conducted in both English and Japanese versions, allowing respondents to choose their preferred language for completing the survey. In this secondary data analysis, we only include respondents with more than 50% complete entries.

3.1.2. Exclusion Criteria

Prospective participants who meet any of the following criteria were excluded from this research.

a) persons under 20 years of age

b) non-internet users

It was important to understand the diverse users in this study, therefore, there were no exclusion criteria for gender and race.

3.2. Questionnaire

The original survey covered twelve sections, including information sheet and consent, socio-demographics information, perspective towards COVID-19 preventive measures, experience with COVID-19, employment status after COVID-19, mental impact, trust in the government and the authorities, beliefs and attitudes, behavioral aspects, online information-seeking behavior, digital literacy, and health literacy. The complete questionnaire consisted of 36 items in total, as shown in the Appendix. For this secondary data analysis, we only utilized 23 items

across five sections, consisting of socio-demographics information, perspective on COVID-19's preventive measurements, employment status after COVID-19, mental aspect and behavioral aspect.

3.3. Data Analysis

The original survey was conducted using SurveyMonkey an online survey administration platform. The data related to the five included sections were exported from the platform for further analysis. The analysis was done using state-of-the-art statistical software and packages, including Microsoft Excel 365 and R version 4.3.0 (2023-04-21 ucrt). Descriptive statistics were reported using frequencies, percentages, medians, and interquartile range (IQR) as appropriate. Statistical differences between the various subscales of perspectives, beliefs, and expectations were evaluated against nationalities. Non-parametric methods, including chi-square test and Mann-Whitney U test, were used, accordingly to the characteristics of the variable data between Japanese and foreign populations. For categorial variables, chi-square tests were used to compare the group difference. Mann-Whitney test were conducted to compare two independent groups in variable measured on a continuous scale. We accepted a p-value of <0.05, which was considered to be statistically significant.

4. RESULTS

Three hundred sixty responses were included in this study. The median age was 42 years old, with an interquartile range between 32 and 52 years old. The median year of birth across the sample was 1980. The majority of respondents resided in "a big city", accounting for 46.8% of the study population, and nearly half were from Tokyo (49.9%). 87.2% of all

participants were fully vaccinated, showcasing a high uptake rate in general.

The survey also delved into the psychological impact of the pandemic, with the median level of fear of COVID-19 registering at 28 on the corresponding fear scale (IQR: 7-51). This suggests a moderate level of concern among the participants. Most reported that they had tested positive for COVID-19, or experienced mild symptoms from COVID-19 with 91.5% and 91.6%, respectively, indicating either a benign encounter with the virus or effective coping mechanisms. All participants reported direct or indirect severe experiences, reflecting the pervasive impact of the pandemic.

The economic consequences of COVID-19 were prominent, with 93.2% of the participants not reporting reduced work hours or participation in the labour force. Yet 98.9% retained their jobs, and 99.1% maintained their businesses. Transition to a home office was made by 58.0% of the participants, demonstrating a substantial shift in work environment. The provision of aid was common, with 77.6% receiving some form of financial support during this period.

As detailed in Table 1, among all the included responses, there was a notable representation of Japanese at 96.1% (343), whereas that of non-Japanese is at 3.9% (14). The median age of non-Japanese participants were significantly younger than the Japanese ($p=0.004$), with a median age of 33 (IQR: 30.25-38.25) compared to the median age of Japanese participants of 42 (IQR: 32.00-52.00). The familial structure also differed, with non-Japanese reporting a median of 0.5 family members (IQR: 0-1), significantly lower than their Japanese counterparts (median 2, IQR: 1-3, $p<0.001$). These findings highlight the demographic and social distinctions between the groups.

The analysis further revealed disparities among different groups of occupational types ($p<0.001$), indicating variations in the employment sectors between the Japanese and non-Japanese groups. Among different work types, we observed major differences in working in

the Medical and Welfare Industry (15.4% of non-Japanese vs. 47.3% of Japanese) and as Students (23.1% of non-Japanese vs. 15.3% of Japanese).

Non-Japanese residents exhibited higher full vaccination rates than their Japanese counterparts (92.9% vs. 86.9%). The vaccination type displayed significant differences, with a notably higher percentage of non-Japanese receiving the Moderna vaccine (50.0% vs. 18.1%, $p=0.009$). Pfizer was the predominant vaccine choice, with 81.6% of the Japanese group and 57.1% of the non-Japanese group choosing it. These differences indicated a variance in vaccine selection between the groups.

Language preference was another area of significant difference, with a stark contrast between the groups (78.6% of non-Japanese vs. 2.3% of Japanese preferring English language, $p<0.001$), suggesting differences in language preference between the groups.

The survey result also revealed that non-Japanese are significantly less afraid of COVID-19 than Japanese respondents (median score of 47 vs. 28, $p=0.049$). Furthermore, the adaptation to a home office setting was significantly less common among non-Japanese participants (21.4% vs. 59.2%, $p=0.012$), and the receipt of aid showed a notable discrepancy, with Japanese participants more likely to receive aid (79.1% vs. 42.9%, $p=0.004$). The data presented here paint a comprehensive picture of the diverse experiences of residents in Japan during the pandemic, particularly highlighting the distinct challenges faced by the non-Japanese population. These results underscore the importance of developing culturally sensitive public health strategies that take the varied demographic, socioeconomic, and psychological factors influencing individuals' experiences during a global health crisis into consideration.

Table 1: Overall results of all respondents and comparison between the Japanese and non-Japanese groups

Category	valuable	Overall	Japanese	Non-Japanese	*p-value*	Test
Socio-demographics and health status	n	360	343	14		
	Male (%)	130 (36.2)	120 (35.1)	8 (57.1)	0.161	
	Age (median [IQR])	42.00 [32.00, 52.00]	42.00 [32.00, 52.00]	33.00 [30.25, 38.25]	0.04	nonnorm
	Year (median [IQR])	1,980.00 [1,970.00, 1,990.00]	1,980.00 [1,970.00, 1,990.00]	1,989.00 [1,983.75, 1,991.75]	0.04	nonnorm
	HighEdu (%)				0.706	
	Junior high school	2 (0.6)	2 (0.6)	0 (0.0)		
	High school	12 (3.3)	12 (3.5)	0 (0.0)		
	Technical/vocational school	26 (7.2)	26 (7.6)	0 (0.0)		
	Junior college	8 (2.2)	8 (2.3)	0 (0.0)		
	University with/without degree	142 (39.6)	136 (39.8)	5 (35.7)		
	Graduate school	169 (47.1)	158 (46.2)	9 (64.3)		
	Income (%)				0.879	
	less than 2 million yen	19 (5.7)	18 (5.6)	1 (7.1)		
	2 million yen – 4 million yen	38 (11.3)	37 (11.6)	1 (7.1)		
	4 million yen – 6 million yen	71 (21.2)	65 (20.4)	4 (28.6)		
	6 million yen – 8 million yen	52 (15.5)	50 (15.7)	2 (14.3)		
	8 million yen – 10 million yen	44 (13.1)	43 (13.5)	1 (7.1)		
	10 million yen – 12 million yen	27 (8.1)	27 (8.5)	0 (0.0)		
	12 million yen – 15 million yen	21 (6.3)	20 (6.3)	1 (7.1)		
	More than 15 million yen	63 (18.8)	59 (18.5)	4 (28.6)		
	Number of family members (median [IQR])	2.00 [1.00, 3.00]	2.00 [1.00, 3.00]	0.50 [0.00, 1.00]	<0.001	nonnorm
	R_Spouse (%)	162 (69.8)	155 (70.5)	6 (60.0)	0.724	
	R_Child (%)	101 (43.5)	98 (44.5)	2 (20.0)	0.228	
	R_Grandchild (%)	0 (0.0)	0 (0.0)	0 (0.0)		
	R_Parent (median [IQR])	61 (26.3)	61 (27.7)	0 (0.0)	0.115	
	R_OtherF (%)	28 (12.1)	28 (12.7)	0 (0.0)	0.478	
	R_Other (%)	3 (1.3)	0 (0.0)	3 (30.0)	<0.001	
	LivingArea (%)				0.192	
	Big city	168 (46.8)	155 (45.3)	11 (78.6)		
	Suburbs or outskirts of a big city	120 (33.4)	117 (34.2)	2 (14.3)		
	Town or small city	55 (15.3)	54 (15.8)	1 (7.1)		
	Country village	15 (4.2)	15 (4.4)	0 (0.0)		
	Farm or home in the countryside	1 (0.3)	1 (0.3)	0 (0.0)		
	Prefecture (%)				1	
	Hokkaido	4 (1.1)	4 (1.2)	0 (0.0)		
	Miyagi	3 (0.8)	3 (0.9)	0 (0.0)		
	Akita	1 (0.3)	1 (0.3)	0 (0.0)		
	Fukushima	2 (0.6)	2 (0.6)	0 (0.0)		
	Ibaraki	2 (0.6)	2 (0.6)	0 (0.0)		
	Tochigi	1 (0.3)	1 (0.3)	0 (0.0)		
	Saitama	10 (2.8)	10 (2.9)	0 (0.0)		
	Chiba	42 (11.7)	40 (11.7)	2 (14.3)		
	Tokyo	179 (49.9)	165 (48.2)	12 (85.7)		
	Kanagawa	49 (13.6)	48 (14.0)	0 (0.0)		
	Niigata	2 (0.6)	2 (0.6)	0 (0.0)		

	Toyama	3 (0.8)	3 (0.9)	0 (0.0)	
	Yamanashi	1 (0.3)	1 (0.3)	0 (0.0)	
	Nagano	2 (0.6)	2 (0.6)	0 (0.0)	
	Shizuoka	7 (1.9)	7 (2.0)	0 (0.0)	
	Aichi	2 (0.6)	2 (0.6)	0 (0.0)	
	Mie	1 (0.3)	1 (0.3)	0 (0.0)	
	Shiga	1 (0.3)	1 (0.3)	0 (0.0)	
	Kyoto	5 (1.4)	5 (1.5)	0 (0.0)	
	Osaka	6 (1.7)	6 (1.8)	0 (0.0)	
	Hyogo	7 (1.9)	7 (2.0)	0 (0.0)	
	Wakayama	1 (0.3)	1 (0.3)	0 (0.0)	
	Okayama	5 (1.4)	5 (1.5)	0 (0.0)	
	Hiroshima	2 (0.6)	2 (0.6)	0 (0.0)	
	Kagawa	2 (0.6)	2 (0.6)	0 (0.0)	
	Ehime	2 (0.6)	2 (0.6)	0 (0.0)	
	Kochi	3 (0.8)	3 (0.9)	0 (0.0)	
	Fukuoka	5 (1.4)	5 (1.5)	0 (0.0)	
	Saga	2 (0.6)	2 (0.6)	0 (0.0)	
	Nagasaki	1 (0.3)	1 (0.3)	0 (0.0)	
	Kumamoto	1 (0.3)	1 (0.3)	0 (0.0)	
	Miyazaki	2 (0.6)	2 (0.6)	0 (0.0)	
	Kagoshima	1 (0.3)	1 (0.3)	0 (0.0)	
	Okinawa	2 (0.6)	2 (0.6)	0 (0.0)	
	WorkType (%)				<0.001
	Mining and Quarrying	6 (1.8)	6 (1.9)	0 (0.0)	
	Electricity, Gas and Water Supply	4 (1.2)	4 (1.3)	0 (0.0)	
	Construction, Architecture	1 (0.3)	1 (0.3)	0 (0.0)	
	Financial, Insurance business	3 (0.9)	2 (0.6)	1 (7.7)	
	Real estate business	4 (1.2)	4 (1.3)	0 (0.0)	
	Wholesale and Retail Trade	1 (0.3)	1 (0.3)	0 (0.0)	
	Accommodation and food services (hotels, restaurants)	4 (1.2)	4 (1.3)	0 (0.0)	
	Transport, Storage, Communications	24 (7.3)	24 (7.7)	0 (0.0)	
	Education	51 (15.6)	49 (15.7)	2 (15.4)	
	Academic research, professional engineering	18 (5.5)	17 (5.4)	1 (7.7)	
	Medical and Welfare Industry	151 (46.2)	148 (47.3)	2 (15.4)	
	Social and Personal Services	6 (1.8)	5 (1.6)	1 (7.7)	
	Student	51 (15.6)	48 (15.3)	3 (23.1)	
	Other	3 (0.9)	0 (0.0)	3 (23.1)	
	CovVax (%)				0.069
	I am fully vaccinated with 3 shots including booster shot	313 (87.2)	298 (86.9)	13 (92.9)	
	I am partially vaccinated	3 (0.8)	2 (0.6)	1 (7.1)	
	I am unvaccinated	9 (2.5)	9 (2.6)	0 (0.0)	
	Unknown	1 (0.3)	1 (0.3)	0 (0.0)	
	I have completed the initial two shots	33 (9.2)	33 (9.6)	0 (0.0)	
	Pfizer (%)	276 (80.7)	266 (81.6)	8 (57.1)	0.055
	Moderna (%)	66 (19.3)	59 (18.1)	7 (50.0)	0.009
	Astra (%)	2 (0.6)	1 (0.3)	1 (7.1)	0.136
	Unknown (%)	1 (0.3)	1 (0.3)	0 (0.0)	1
	Other (%)	1 (0.3)	0 (0.0)	1 (7.1)	0.021
	Nationality (%)				<0.001

	Japanese	343 (96.1)	343 (100.0)	0 (0.0)		
	Chinese	1 (0.3)	0 (0.0)	1 (7.1)		
	Korean	1 (0.3)	0 (0.0)	1 (7.1)		
	Other	12 (3.4)	0 (0.0)	12 (85.7)		
	PrefLangu = English (%)	19 (5.3)	8 (2.3)	11 (78.6)	<0.001	
Perspective of COVID-19 preventative measurements	Exp_Posi = 1 (%)	324 (91.5)	309 (91.7)	12 (85.7)	0.767	
	Exp_Nega = 1 (%)	172 (48.5)	166 (49.1)	4 (28.6)	0.217	
	Exp_Mild = 1 (%)	318 (91.6)	303 (91.8)	12 (85.7)	0.753	
	Exp_Severe = 1 (%)	344 (100.0)	328 (100.0)	13 (100.0)	NA	
	Exp_PplMild = 1 (%)	153 (42.9)	146 (42.9)	5 (35.7)	0.795	
	Exp_PplSev = 1 (%)	326 (92.6)	312 (93.1)	11 (78.6)	0.13	
	NumPplCov (%)				0.352	
	Fewer than 5	243 (68.6)	233 (69.1)	8 (57.1)		
	Between 5 and 10	81 (22.9)	77 (22.8)	3 (21.4)		
	Between 10 and 20	18 (5.1)	16 (4.7)	2 (14.3)		
	More than 20	12 (3.4)	11 (3.3)	1 (7.1)		
	HowAfraidCov (median [IQR])	28.00 [7.00, 51.00]	28.00 [6.00, 51.00]	47.00 [28.25, 64.50]	0.049	nonnorm
	HAC_coded (%)				0.251	
	0-20 very afraid	120 (34.6)	117 (35.5)	2 (14.3)		
	21-40	90 (25.9)	87 (26.4)	3 (21.4)		
	41-60	75 (21.6)	68 (20.6)	5 (35.7)		
	61-80	43 (12.4)	41 (12.4)	2 (14.3)		
	81-100 not at all afraid	19 (5.5)	17 (5.2)	2 (14.3)		
employment status after COVID-19	LostJob = 1 (%)	347 (98.9)	330 (98.8)	14 (100.0)	1	
	CloseBusi = 1 (%)	349 (99.1)	333 (99.4)	13 (92.9)	0.262	
	ReduPart = 1 (%)	328 (93.2)	311 (92.8)	14 (100.0)	0.618	
	HomeOffice = 1 (%)	206 (58.0)	200 (59.2)	3 (21.4)	0.012	
	ReceiveAid = 1 (%)	273 (77.6)	265 (79.1)	6 (42.9)	0.004	
	GoWork = 1 (%)	99 (28.0)	92 (27.3)	6 (42.9)	0.333	
	DaycareKid = 1 (%)	272 (77.5)	256 (76.6)	14 (100.0)	0.084	
	HowAfraRecession (median [IQR])	49.00 [29.00, 72.00]	49.00 [28.50, 72.00]	49.50 [42.75, 75.50]	0.455	nonnorm
	HARece_coded (%)				0.89	
	0-20	61 (18.2)	60 (18.8)	1 (8.3)		
	21-40	56 (16.7)	53 (16.6)	2 (16.7)		
	41-60	113 (33.7)	108 (33.8)	4 (33.3)		
	61-80	44 (13.1)	42 (13.1)	2 (16.7)		
	81-100	61 (18.2)	57 (17.8)	3 (25.0)		
	Future (%)				0.383	
	not at all	110 (30.8)	104 (30.6)	6 (42.9)		
	a little bit	108 (30.3)	101 (29.7)	6 (42.9)		
	somewhat	64 (17.9)	61 (17.9)	1 (7.1)		
	quite a bit	44 (12.3)	44 (12.9)	0 (0.0)		
	very much	31 (8.7)	30 (8.8)	1 (7.1)		
	Job (%)				0.829	
	not at all	158 (44.1)	149 (43.7)	8 (57.1)		
	a little bit	81 (22.6)	78 (22.9)	3 (21.4)		
	somewhat	73 (20.4)	69 (20.2)	2 (14.3)		
	quite a bit	30 (8.4)	29 (8.5)	1 (7.1)		
	very much	16 (4.5)	16 (4.7)	0 (0.0)		
	Satisf (%)				0.925	
	not at all	180 (50.6)	172 (50.7)	7 (50.0)		
	a little bit	46 (12.9)	43 (12.7)	2 (14.3)		
	somewhat	86 (24.2)	81 (23.9)	4 (28.6)		
	quite a bit	26 (7.3)	25 (7.4)	1 (7.1)		
	very much	18 (5.1)	18 (5.3)	0 (0.0)		
mental aspect	FeelAnxious (%)				0.448	
	not at all	196 (56.6)	184 (55.9)	10 (71.4)		
	several days	100 (28.9)	96 (29.2)	4 (28.6)		

	more than half of days	22 (6.4)	21 (6.4)	0 (0.0)	
	nearly every day	28 (8.1)	28 (8.5)	0 (0.0)	
	NotAbleStop (%)				0.534
	not at all	240 (69.6)	226 (68.9)	12 (85.7)	
	several days	74 (21.4)	72 (22.0)	2 (14.3)	
	more than half of days	15 (4.3)	14 (4.3)	0 (0.0)	
	nearly every day	16 (4.6)	16 (4.9)	0 (0.0)	
	FeelDown (%)				0.58
	not at all	244 (70.5)	230 (69.9)	12 (85.7)	
	several days	75 (21.7)	73 (22.2)	2 (14.3)	
	more than half of days	14 (4.0)	13 (4.0)	0 (0.0)	
	nearly every day	13 (3.8)	13 (4.0)	0 (0.0)	
	LittleInterest (%)				0.502
	not at all	234 (67.8)	223 (68.0)	9 (64.3)	
	several days	79 (22.9)	74 (22.6)	5 (35.7)	
	more than half of days	18 (5.2)	17 (5.2)	0 (0.0)	
	nearly every day	14 (4.1)	14 (4.3)	0 (0.0)	
	FeltLonely (%)				0.191
	not at all	236 (68.6)	228 (69.7)	7 (50.0)	
	several days	76 (22.1)	68 (20.8)	6 (42.9)	
	more than half of days	15 (4.4)	14 (4.3)	1 (7.1)	
	nearly every day	17 (4.9)	17 (5.2)	0 (0.0)	
Behavioral aspect	GetCOV (%)				0.488
	strongly disagree	16 (4.7)	14 (4.3)	2 (14.3)	
	disagree	26 (7.6)	25 (7.7)	1 (7.1)	
	undecided	1 (0.3)	1 (0.3)	0 (0.0)	
	agree	166 (48.5)	158 (48.6)	6 (42.9)	
	strongly agree	88 (25.7)	85 (26.2)	2 (14.3)	
	neutral	45 (13.2)	42 (12.9)	3 (21.4)	
	Responsib (%)				0.38
	strongly disagree	6 (1.8)	5 (1.5)	1 (7.7)	
	disagree	26 (7.6)	26 (8.0)	0 (0.0)	
	agree	185 (54.4)	176 (54.3)	6 (46.2)	
	strongly agree	61 (17.9)	58 (17.9)	3 (23.1)	
	neutral	62 (18.2)	59 (18.2)	3 (23.1)	
	ManageHealth (%)				0.655
	strongly disagree	21 (6.2)	19 (5.9)	2 (14.3)	
	disagree	105 (30.8)	99 (30.6)	5 (35.7)	
	undecided	4 (1.2)	4 (1.2)	0 (0.0)	
	agree	101 (29.6)	95 (29.3)	4 (28.6)	
	strongly agree	13 (3.8)	12 (3.7)	1 (7.1)	
	neutral	97 (28.4)	95 (29.3)	2 (14.3)	
	LeaveHome (%)				0.165
	less than once per week	63 (18.7)	63 (19.6)	0 (0.0)	
	once per week	52 (15.4)	48 (15.0)	2 (14.3)	
	a few times per week	93 (27.6)	90 (28.0)	3 (21.4)	
	once a day	87 (25.8)	82 (25.5)	5 (35.7)	
	multiple times a day	42 (12.5)	38 (11.8)	4 (28.6)	
	Exercise (%)				0.001
	less than once per week	124 (36.7)	122 (37.9)	1 (7.1)	
	once per week	71 (21.0)	71 (22.0)	0 (0.0)	
	a few times per week	100 (29.6)	90 (28.0)	9 (64.3)	
	once per day	34 (10.1)	30 (9.3)	4 (28.6)	
	multiple times per day	9 (2.7)	9 (2.8)	0 (0.0)	
	GroceShopping (%)				0.526
	less than once per week	30 (8.8)	30 (9.3)	0 (0.0)	
	once per week	88 (25.9)	84 (25.9)	4 (28.6)	
	a few times per week	187 (55.0)	178 (54.9)	7 (50.0)	
	once per day	25 (7.4)	23 (7.1)	2 (14.3)	
	multiple times per day	10 (2.9)	9 (2.8)	1 (7.1)	
	SeeFriend (%)				0.06

	less than once per week	255 (75.4)	247 (76.7)	7 (50.0)	
	once per week	32 (9.5)	29 (9.0)	3 (21.4)	
	a few times per week	42 (12.4)	38 (11.8)	3 (21.4)	
	once per day	5 (1.5)	5 (1.6)	0 (0.0)	
	multiple times per day	4 (1.2)	3 (0.9)	1 (7.1)	
	GoToWork (%)				0.003
	less than once per week	41 (12.3)	35 (11.0)	6 (46.2)	
	once per week	13 (3.9)	12 (3.8)	1 (7.7)	
	a few times per week	80 (24.1)	78 (24.6)	1 (7.7)	
	once per day	178 (53.6)	173 (54.6)	4 (30.8)	
	multiple times per day	20 (6.0)	19 (6.0)	1 (7.7)	
	MedAppoint (%)				<0.001
	less than once per week	319 (94.9)	305 (95.3)	13 (92.9)	
	once per week	9 (2.7)	8 (2.5)	0 (0.0)	
	a few times per week	5 (1.5)	5 (1.6)	0 (0.0)	
	once per day	1 (0.3)	0 (0.0)	1 (7.1)	
	multiple times per day	2 (0.6)	2 (0.6)	0 (0.0)	
	GoPharma (%)				0.936
	less than once per week	314 (94.0)	300 (94.0)	13 (100.0)	
	once per week	13 (3.9)	12 (3.8)	0 (0.0)	
	a few times per week	4 (1.2)	4 (1.3)	0 (0.0)	
	once per day	1 (0.3)	1 (0.3)	0 (0.0)	
	multiple times per day	2 (0.6)	2 (0.6)	0 (0.0)	
	GoShops (%)				0.216
	less than once per week	138 (40.7)	132 (40.7)	5 (38.5)	
	once per week	89 (26.3)	84 (25.9)	4 (30.8)	
	a few times per week	91 (26.8)	89 (27.5)	2 (15.4)	
	once per day	13 (3.8)	11 (3.4)	2 (15.4)	
	multiple times per day	8 (2.4)	8 (2.5)	0 (0.0)	
	RunErrands (%)				0.62
	less than once per week	165 (48.5)	160 (49.4)	5 (35.7)	
	once per week	90 (26.5)	83 (25.6)	6 (42.9)	
	a few times per week	71 (20.9)	67 (20.7)	3 (21.4)	
	once per day	7 (2.1)	7 (2.2)	0 (0.0)	
	multiple times per day	7 (2.1)	7 (2.2)	0 (0.0)	
	DrinkAlcoh (%)				0.964
	less than once per week	208 (64.2)	198 (64.3)	9 (64.3)	
	once per week	30 (9.3)	29 (9.4)	1 (7.1)	
	a few times per week	53 (16.4)	49 (15.9)	3 (21.4)	
	once per day	28 (8.6)	27 (8.8)	1 (7.1)	
	multiple times per day	5 (1.5)	5 (1.6)	0 (0.0)	
	EatUnhealthy (%)				0.867
	less than once per week	96 (28.3)	90 (27.9)	5 (35.7)	
	once per week	62 (18.3)	59 (18.3)	3 (21.4)	
	a few times per week	109 (32.2)	104 (32.2)	4 (28.6)	
	once per day	53 (15.6)	51 (15.8)	2 (14.3)	
	multiple times per day	19 (5.6)	19 (5.9)	0 (0.0)	
	HowLikelyWithCC (%)				0.004
	less than once per week	92 (26.9)	90 (27.7)	2 (14.3)	
	once per week	101 (29.5)	92 (28.3)	8 (57.1)	
	a few times per week	111 (32.5)	110 (33.8)	0 (0.0)	
	once per day	38 (11.1)	33 (10.2)	4 (28.6)	

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5. DISCUSSION

This study aimed to examine the mental, behavioral, and financial challenges faced by foreign residents in Japan during the COVID-19 pandemic, contributing to the limited but growing body of research on the experiences of foreign residents during global health crises. The significant age (or year of birth) differences between Japanese and non-Japanese residents is indicative of the distinct generation profiles of these groups, which may influence their experiences and responses to the pandemic. Such differences are crucial in understanding the varied impacts of COVID-19, as noted in the broader literature.

The study's findings on vaccination rates are particularly pertinent, revealing a even higher uptake among the non-Japanese residents, suggesting effective access to healthcare services despite different nationalities. In the survey question enquiring how afraid you or your loved ones are to get sick and suffer severely from the coronavirus, the finding revealed that non-Japanese participants express less fear (Median score of 47; IQR: 28.25-64.5), contrasting with the significantly higher levels of fear and anxiety observed in Japanese residents (Median score 28; IQR: 6-51), indicating a marked difference in perception and psychological aspects between these groups. This discrepancy might be attributed to Japan’s cultural norms surrounding crisis response, which emphasize resilience and collective action. However, as the pandemic progresses, ongoing assessment of psychological well-being is necessary, especially since mental health repercussions can persist beyond the immediate crisis.

Economic resilience was evident among the study’s participants, with a majority retaining their employment in both Japanese and non-Japanese groups. This is consistent with Japan's comprehensive economic response to the pandemic, which included substantial fiscal support for businesses and individuals. The shift to remote work and the reported financial aid receipt have been a common global theme. However, our study indicated that non-Japanese respondents were less likely to take advantage of home office arrangements during the COVID-

19 pandemic, suggesting that they might be more vulnerable to exposure to the disease compared to the Japanese group. Additionally, the fact that the non-Japanese group was less likely to receive financial aid indicated that they may be unable to access to support from the government. However, the confirmation of these indicative issues require further investigation in future studies.

The profound psychological impact, as indicated by feelings of anxiety and loneliness, resonates with global concerns about the mental health effects of COVID-19. These findings underscore the need for mental health support systems that are accessible both to native and foreign residents, as mental health is an integral component of public health.

Significant findings related to family structure and language preference highlight the intersectional nature of the pandemic's impact. Our analysis suggested that the non-Japanese respondents were less inclined to prefer Japanese as their primary language. The challenges faced by non-Japanese residents in accessing information and support due to language barriers are well-documented. In Japan, most COVID-19 emergency communication channels were conducted in the Japanese language, frequently lacking or providing only limited English language support. This study adds to the evidence base, suggesting that multilingual communication strategies are essential in disaster response. Future studies may be necessary to examine the relationship between language barrier and equalities (such as work opportunity and access to financial aids) in the non-Japanese population.

In addressing these challenges, it is crucial to adopt a culturally sensitive approach to public health planning. The pandemic has demonstrated the importance of taking cultural and linguistic diversity into consideration for public health interventions. By identifying the specific needs of foreign residents, policymakers can develop targeted strategies to foster a multicultural coexistence society, as has been recommended by various scholars.

Lastly, the current study provides valuable insights into the unique challenges faced by

foreign residents in Japan from a cross sectional timepoint at the latter phase of the COVID-19 pandemic. The findings highlight the need for inclusive public health strategies that accommodate cultural and linguistic diversity, ensuring equitable access to information and support for all residents during a public health crisis.

5.1. Implications for public health

Based on the detailed results of the survey, specific implications can be derived that highlight the distinct challenges faced by foreign residents in Japan during the COVID-19 pandemic. These implications are drawn in each of the categories from the key findings of the survey:

5.1.1. Socio-Demographics and Health Status

The survey revealed significant socio-demographic differences, especially in age and family structure, between Japanese and non-Japanese residents. Non-Japanese participants were generally younger, and had smaller family sizes. This demographic profile suggests unique challenges for the relatively younger foreign residents in accessing healthcare and information from residing family members, underscoring the need for targeted public health strategies. The existing study findings also support these potential issues, revealing high levels of stress, anxiety, and depression among Chinese residents in Japan. These highlighted the critical role of tailored mental health resources in the future. Additionally, the impact of government policies on the daily lives of foreign residents indicates the complex interplay between policy decisions and the well-being of foreign residents.

5.1.2. Perspectives on COVID-19 Preventative Measures

Our study result highlighted significant differences in language preferences between Japanese and non-Japanese residents, with a stark contrast in English language preference (78.6% of non-Japanese vs. 2.3% of Japanese). This finding underscores the challenges in disseminating COVID-19-related information effectively to non-Japanese residents, emphasizing the need for multilingual and culturally sensitive health communication. Japan's strict border policies and their socio-cultural implications are discussed in one study, while another stresses the importance of accessible information and consultation services for foreign residents, pointing out financial distress and discrimination faced by these groups due to language barriers[4].

5.1.3. Employment Status After COVID-19

The economic consequences of the pandemic were significant, with disparities in employment sectors between Japanese and non-Japanese residents. The survey indicated a substantial shift in work environment, with non-Japanese less likely to adapt to a home office setting (21.4% vs. 59.2%, p=0.012) and less likely to receive financial aid (42.9% vs. 79.1%, p=0.004). These differences highlight the need for inclusive economic recovery plans that address the diverse needs of the population. The challenges faced by foreign residents to adapt to new work environments and consumer habits are discussed, while the complexities of addressing the economic fallout of the pandemic are highlighted, indicating the need for agile and responsive policy-making.

5.1.4. Mental Aspect

The mental health impact of the pandemic, as shown by the survey, is significant, with every participant reporting severe experiences either directly or indirectly. This pervasive

psychological effect necessitates comprehensive mental health support tailored to diverse populations. The negative effects of the pandemic on mental well-being, emphasizing the importance of effective fear management strategies, are illustrated in one study. Additionally, the protective role of disaster preparedness in reducing psychological symptoms is suggested, indicating the need for proactive mental health interventions.

5.1.5. Behavioral Aspects

The pandemic led to significant behavioral changes, particularly in work environments and economic conditions. The notable shift to remote work and the economic impact, such as reduced work hours, reflect major adjustments in lifestyle and social interactions. The survey's findings on the lower adaptation to home office settings among non-Japanese residents and their lesser likelihood of receiving financial aid highlight the need for support in these transitions. The importance of policies that support diverse work-life norms and provide economic support to all residents, regardless of nationality, is reinforced in the studies.

5.2. Limitations

This study presents several limitations that should be considered when interpreting the findings. The study involved a comparative analysis between Japanese and non-Japanese groups. However, the sample size, particularly for the non-Japanese group, was small compared with the Japanese group, which restricts the statistical power of the findings. Therefore, we were unable to conduct multiple variable regression analysis, and adjust for potential confounders, limiting the ability to generalize the results to a broader population. The study relied on p-values to determine the significance of the findings without further details on the effect sizes, confidence intervals, or corrections for multiple comparisons. These additional statistical measures were crucial for interpreting the practical significance of

the results.

In the future, cultural and contextual factors should be considered. The study compared groups across nationalities, yet it did not account for the multitude of cultural, socioeconomic, environmental, and behavioral factors, all of which may influence the outcomes. The complexity of cross-cultural comparisons necessitates a comprehensive approach that requires further studies to fully address.

As observed from the descriptive results, there was a relatively younger age distribution of the samples compared to the general Japanese population. The survey was targeted to online users only, which may introduce inherent biases in generalizing the results to the overall Japanese population.

5.3. Conclusions

The culmination of this study offers a snapshot understanding of the multifaceted challenges that foreign residents in Japan have faced during the COVID-19 pandemic. The research has illuminated the complexities of navigating a public health crisis in a non-native cultural and linguistic landscape, underscoring the importance of accessible and inclusive public health strategies. This study contributes to the growing body of knowledge on the experiences of foreign residents in Japan during health crises. It underscores the critical need for inclusive and culturally sensitive public health interventions. By ensuring equitable access to information and support, we can better prepare for and respond to future public health emergencies, ultimately enhancing the resilience of both native and foreign populations.

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Appendix A: Original questionnaire by survey monkey

Understanding the Japanese online community's perspectives, beliefs and expectations towards COVID-19 information

1. Information sheet and consent

Description: Digital communication has opened new frontiers in the field of pandemic management. There has also been an overload of information, true or otherwise (so called 'infodemic'), which have brought with them unprecedented challenges in the response to COVID-19. We are therefore, conducting this online survey to understand Japanese people perspectives, beliefs and expectations about COVID-19, and that would allow us to better devise digital communication strategies under pandemics. Ultimately, through this study outcome, we hope to develop strategy allowing people receive the correct and trustworthy information so that they can make informed decisions.

Who will complete the survey: We are inviting the general public, who is currently residing in Japan and age 20 or above, to take this online survey. There are 38 items in this survey and it may take you about 10-15 mins to complete the entire survey.

Privacy and Confidentiality: Information collected is strictly confidential. When using your data, we will delete information from which a specific individual can be identified, and anonymous participant identify data by using symbols or numbers (subject identification codes) instead. Interactions with data between those involved in the research will be done using the subject identification codes to maintain confidentiality. Tables containing the personal information from which an individual can be immediately identified, and its corresponding subject identification code will be managed under the responsibility of the principal investigator, by storing them in locked cabinets or password-protected computer.

There is the possibility that the results of this research based on collected data will be summarized and presented at conferences or in medical journals or that the data information gathered in this research will be used in another research. In either case, information allowing for the immediate identification of an individual research subject will not be included. Also, only those participants who provided consent for supporting further study will be contacted for subsequent follow-up study.

There are no risks to your health from taking part in this study. Revealing about your experience with COVID-19 pandemic may be upsetting. You can quit the survey anytime you want. If you need clinical psychological support, you can get a free consultation (within 30 minutes) from the following link (http://jfpsp.net/PsychotherapyCenter/covid19.html).

Questions about this study: The project is led by Graduate School of Public Health, St. Luke's International University. If you have any questions about the study, please contact Dr. Zole SY Wong, Associate Professor, Graduate School of Public Health, St. Luke's International University (by email: zolewong@slcn.ac.jp). The project title and team are listed below.

Project title: "Understanding the Japanese online community's perspectives, beliefs and expectations towards COVID-19 information"

Principle investigator
- Dr. Zole SY Wong, Associate Professor, Graduate School of Public Health, St. Luke's International University. Email: zolewong@slcn.ac.jp

Research collaborator
- Dr. Rimi Tanii, Assistant Professor, School of Medicine, St. Marianna University;
MPH student, Graduate School of Public Health, St. Luke's International University
- Ms. July Khin Maung Soe, MPH student, Graduate School of Public Health, St. Luke's International University

*** 1. It is your choice to taking part in this study and your participation in this survey is completely voluntary. If you decide to participate but subsequently you wish to change your mind, you are totally free to withdraw this study at any time without any consequence. You can stop the survey at any time you want and can refuse to answer or skip any questions (except this consent). By endorsing this consent, you agree to participate in the study as described above. You can save or print this e-letter for your own records.**

- ◯ Yes
- ◯ No

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2. Eligibility to take the survey

* 2. Do you currently reside in Japan? (Participants must reside in Japan to be eligible for the survey)

- ◯ Yes
- ◯ No

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3. Eligibility to take the survey

* 3. Are you 20 years or above? (Participants must be 20 years or above to be eligible for the survey)

- ◯ Yes
- ◯ No

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4. Socio-demographics and health status

4. What is your gender?

- ◯ Male
- ◯ Female
- ◯ Other

5. In which year have you been born? _____ (year)

6. What is the highest educational level that you have attained? (If you are a student, please indicate the highest level you expect to complete)

- ◯ Junior high school
- ◯ High school
- ◯ Technical/vocational school
- ◯ Junior college
- ◯ University with/without degree
- ◯ Graduate school

7. If you add up the income from all sources for all the members of the household, do you know what your household's annual income is, including tax? If you don't know the exact figure, please give an estimate **(optional)**

- ◯ less than 2 million yen
- ◯ 2 million yen – 4 million yen
- ◯ 4 million yen – 6 million yen
- ◯ 6 million yen – 8 million yen
- ◯ 8 million yen – 10 million yen
- ◯ 10 million yen – 12 million yen
- ◯ 12 million yen – 15 million yen
- ◯ More than 15 million yen

8. How many people other than yourself are currently living with you in your household since the COVID-19 pandemic? _____ (number)

9. Please describe your relation to those who live in your household (choose all that apply)

- ☐ Spouse/ Partner
- ☐ Child
- ☐ Grandchild
- ☐ Parent or parent-in-law
- ☐ Other family member
- ☐ Paid caregiver
- ☐ Friend or other non-family member
- ☐ Other (please specify)

10. Which phrase describes the area where you live?

- ◯ A big city
- ◯ The suburbs or outskirts of a big city
- ◯ A town or a small city
- ◯ A country village
- ◯ A farm or home in the countryside

11. In which prefecture do you live?

- ◯ Hokkaido
- ◯ Aomori
- ◯ Iwate
- ◯ Miyagi
- ◯ Akita
- ◯ Yamagata
- ◯ Fukushima
- ◯ Ibaraki
- ◯ Tochigi
- ◯ Gunma
- ◯ Saitama
- ◯ Chiba
- ◯ Tokyo
- ◯ Kanagawa
- ◯ Niigata
- ◯ Toyama
- ◯ Ishikawa

- Fukui
- Yamanashi
- Nagano
- Gifu
- Shizuoka
- Aichi
- Mie
- Shiga
- Kyoto
- Osaka
- Hyogo
- Nara
- Wakayama
- Tottori
- Shimane
- Okayama
- Hiroshima
- Yamaguchi
- Tokushima
- Kagawa
- Ehime
- Kochi
- Fukuoka
- Saga
- Nagasaki
- Kumamoto
- Oita
- Miyazaki
- Kagoshima
- Okinawa

12. What type of work do you do?

- Agriculture, Forestry, Fishing
- Mining and Quarrying
- Manufacturing
- Electricity, Gas and Water Supply
- Construction, Architecture
- Financial, Insurance business
- Real estate business
- Wholesale and Retail Trade
- Accommodation and food services (hotels, restaurants)
- Transport, Storage, Communications
- Education
- Academic research, professional engineering
- Medial and Welfare Industry
- Social and Personal Services
- Student

Other (please specify)

13. Have you ever received a COVID-19 vaccine?

- I have completed first two initial shots
- I am fully vaccinated with 3 shots including booster shot
- I am partially vaccinated
- I am unvaccinated
- Prefer not to say

14. If you are fully or partially vaccinated, what is the vaccine type you took?

- BioNTech/Pfizer
- Moderna
- Oxford/AstraZeneca
- Unknown

Other (please specify)

15. What is your nationality?

- ◯ Japanese
- ◯ Chinese
- ◯ Korean

Other (please specify)

16. What is your preferred language to receive COVID-19 information?

- ◯ Japanese
- ◯ English
- ◯ Chinese
- ◯ Korean

Other (please specify)

Understanding the Japanese online community's perspectives, beliefs and expectations towards COVID-19 information

5. Perspective on COVID-19's preventative measurements

17. What is the possible transmission route of COVID-19? (You may choose more than 1 answer)

- ☐ Airborne
- ☐ Droplets
- ☐ Contact with contaminated surfaces
- ☐ Contaminated foods and drinks
- ☐ Pets
- ☐ Handshaking and kissing

18. What are the precautionary measurements to reduce the risk of COVID-19 infection? (You may choose more than 1 answer)

- ☐ Hand washing with water and soap
- ☐ Hand washing with alcoholic disinfectant
- ☐ Face masks
- ☐ Avoiding crowded areas
- ☐ Avoiding handshaking and kissing

19. Considering your health situation during the Corona crisis, please tell us for each of the following experiences whether or not it happened to you

	Yes: it happened to me	No: did **NOT** happened to me
I have been tested positively for COVID-19.	◯	◯
I have been tested negatively for COVID-19.	◯	◯
I have or had mild symptoms of COVID-19.	◯	◯
I have or had severe symptoms of COVID-19.	◯	◯
People close to me have or had mild symptoms.	◯	◯
People close to me have or had severe symptoms.	◯	◯

20. How many do you know who have, or think they have COVID-19?

- Fewer than 5
- Between 5 and 10
- Between 10 and 20
- More than 20

21. How afraid are you that you or your loved ones get sick and suffer severely from the Corona virus?

0 (Very afraid) 3 (Neither, nor) 5 (Not at all afraid)

Understanding the Japanese online community's perspectives, beliefs and expectations towards COVID-19 information

6. Employment status after COVID-19

22. Please, tell us for each of the following economic experiences whether or not it happened to you during the Corona crisis:

	Yes: it happened to me	No: it did **NOT** happened to me
I lost my job.	○	○
I had to close my business.	○	○
I am reduced to part time work.	○	○
I am doing home office.	○	○
I receive money from an aid package.	○	○
I go to work as before.	○	○
I daycare my kids.	○	○

23. How afraid are you that you or your loved ones will suffer from an economic recession following the Corona crisis?

1 (Very afraid) 3 (Neither, nor) 5 (Not at all afraid)

24. Which of these statements do you agree or disagree?

	Not at all	A little bit	Somewhat	Quite a bit	Very much
I worry about the financial problems I will have in the future as a result of COVID-19	○	○	○	○	○
I am concerned about keeping my job and income, including work at home	○	○	○	○	○
COVID 19 has reduced my satisfaction with my present financial situation	○	○	○	○	○

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7. Online COVID-19 Information Seeking Behavior

25. What information's sources do you use to get knowledge about COVID-19?

- [ ] Social media
- [ ] Television
- [ ] News sites
- [ ] Electronic and printable newspaper
- [ ] Official reports
- [ ] Family and friends
- [ ] Doctors and medical staff

26. How long do you spend on average each day getting news or learning about COVID-19? **(minutes)**

27. I would like to ask you for your opinion and about your experience using the Internet for health information since the COVID-19 pandemic. For each statement, tell me which response best reflects your opinion and experience right now.

How useful do you feel the Internet is in helping you in making decisions about your health?

- ◯ Not use at all
- ◯ Not useful
- ◯ Unsure
- ◯ Useful
- ◯ Very useful

28. How important is it for you to be able to access health resources on the Internet?

- ◯ Not at all important
- ◯ Not important
- ◯ Unsure
- ◯ Important
- ◯ Very important

29. I know what health resources are available on the Internet

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Undecided
- ◯ Agree
- ◯ Strongly Agree

30. I know how to find helpful health resources on the Internet

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Undecided
- ◯ Agree
- ◯ Strongly Agree

31. I know how to use the health information I find on the Internet to help me

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Undecided
- ◯ Agree
- ◯ Strongly Agree

32. I have the skills I need to evaluate the health resources I find on the Internet

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Undecided
- ◯ Agree
- ◯ Strongly Agree

33. I feel confident in using information from the Internet to make health decisions

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Undecided
- ◯ Agree
- ◯ Strongly Agree

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8. Mental aspect

36. Over the last two weeks, how often have you been bothered by the following problems?

	Not at all	Several days	More than half of days	Nearly every day
Feeling nervous, anxious or on edge.	○	○	○	○
Not being able to stop or control worrying.	○	○	○	○
Feeling down, depressed or hopeless	○	○	○	○
Little interest or pleasure in doing things.	○	○	○	○
I have felt lonely.	○	○	○	○

34. The social media are full of stories telling that the Corona pandemic is a hoax and that all the lockdown measures are a hysteric overreaction. Do you believe in these stories?

- ○ YES, I do believe in these stories
- ○ NO, I don't believe in these stories

35. How credible do you think are the social media, like Twitter and Facebook, compared to the traditional media, like TV and newspapers, using this scale

1 (Social media are most credible)	3 (Both are the same)	5 (Traditional media are most credible)
○		

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9. Behavioral Aspect

37. How much of these statements do you agree or disagree with?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
My actions will influence whether or not I get COVID-19	○	○	○	○	○
It is my responsibility to follow all public health guidance to prevent the spread of COVID 19 to others	○	○	○	○	○
Managing my health has become more difficult during COVID 19 outbreak	○	○	○	○	○

38. How often do you do these activities since COVID-19 started?

	Less than once per week	Once per week	A few times per week	Once per day	Multiple times per day
How often are you leaving your home?	○	○	○	○	○
Exercise	○	○	○	○	○
Grocery shopping	○	○	○	○	○
Seeing friends	○	○	○	○	○
Going to work	○	○	○	○	○
Medical appointments	○	○	○	○	○
Going to pharmacy	○	○	○	○	○
Going to shops (other than pharmacy)	○	○	○	○	○
Running errands (eg: post office)	○	○	○	○	○
Drinking Alcohol	○	○	○	○	○
Eating unhealthy snacks	○	○	○	○	○

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10. Thank you for responding to the survey!

If you are willing to stay connected, please add our Twitter (@zoiesywong) or contact Dr. Wong through Email (zoiewong@slcn.ac.jp)

40. This part is also completely **voluntary**. Our research group organizes various public seminars focusing on digital health or COVID-19 topics from time to time. If you wish to get in touch, receive a final study report or are willing to support our further study, please indicate your preference.

	Yes	No
I wish to get in touch	○	○
I wish to receive a final study report	○	○
I am willing to support your further study	○	○

Please leave your contact email and name, if you wish to be contacted for further study