Impact of the COVID-19 Pandemic on Chronic Disease Care in India, China, Hong Kong, Korea, and Vietnam

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Abstract

This study aims to provide evidence on how the COVID-19 pandemic has impacted chronic disease care in diverse settings across Asia. Cross-sectional surveys were conducted to assess the health, social, and economic consequences of the pandemic in India, China, Hong Kong, Korea, and Vietnam using standardized questionnaires. Overall, 5672 participants with chronic conditions were recruited from 5 countries. The mean age of the participants ranged from 55.9 to 69.3 years. A worsened economic status during the COVID-19 pandemic was reported by 19% to 59% of the study participants. Increased difficulty in accessing care was reported by 8% to 24% of participants, except Vietnam: 1.6%. The worsening of diabetes symptoms was reported by 5.6% to 14.6% of participants, except Vietnam: 3%. In multivariable regression analyses, increasing age, female participants, and worsened economic status were suggestive of increased difficulty in access to care, but these associations mostly did not reach statistical significance. In India and China, rural residence, worsened economic status and self-reported hypertension were statistically significantly associated with increased difficulty in access to care or worsening of diabetes symptoms. These findings suggest that the pandemic disproportionately affected marginalized and rural populations in Asia, negatively affecting population health beyond those directly suffering from COVID-19.

Keywords

COVID-19; chronic disease; Asia; mobility restrictions

Introduction

COVID-19 has remained rampant globally with the greatest surges of COVID-19 cases, hospitalizations, and deaths at first observed in densely populated regions of moderately affluent countries.[1] In global case studies, older age, men, and presence of comorbidities as well as regional differences in health care access and resources were identified as risk factors for mortality due to COVID-19-related factors.[2] As of November 2021, the number of global confirmed cases was more than 262 million and around 5 million deaths.[3]

In response to the pandemic, China imposed strict lockdown measures in Wuhan and several other areas. In Hong Kong, a proactive, multi-pronged infection control plan was activated in December 2019, including active surveillance, border screenings, contact tracing, and social distancing measures.[4] In India, a nationwide lockdown was imposed in March 2020, which was extended until June, and later further extended to specific containment zones. In Vietnam, social distancing was imposed from April 1 to April 23 with rigid restrictions on all outdoor activities, restricting travel and nonessential services. In Korea, since the first recorded case on January 20, 2020, a proactive government response with widespread testing and tracing controlled the pandemic to lower death rates per capita than most other high-income countries, although Korea has also experienced later waves of the pandemic of equal or greater severity.[5-7] During the early phase of the pandemic, the economy and health

service delivery were disrupted and those with chronic conditions had severe COVID-19 infection, leading to patterns of reduced healthcare utilization that differed by age and sex.[8]

Lockdowns or mobility restrictions for COVID-19 pandemic control have unintended health, social, and economic consequences. This study aimed to assess the impacts of COVID-19 pandemic on chronic disease care during COVID-19-related lockdowns by age, sex, and socio-economic groups, in India, China, Hong Kong, Korea, and Vietnam.

Methods

Study setting:

We described below the cross-sectional surveys conducted to assess the health, social, and economic consequences of COVID-19 pandemic in diverse settings within India, China, Hong Kong, Korea, and Vietnam.

India—Between July 29 and September 12, 2020, a cross-sectional telephone survey was conducted among 1734 adults with one or more chronic conditions (hypertension, diabetes mellitus, cardiovascular disease, or chronic kidney disease), from the 2 large existing cohorts (the Center for Cardio-metabolic Risk Reduction in South Asia, CARRS; and a comprehensive diabetes and hypertension prevention and management program in India-UDAY.[9,10] A stratified random sampling of participants with chronic conditions by age and sex was applied, and approx. 600 participants at each of the 4 sites (Delhi, Chennai, Haryana, and Vishakhapatnam) in India were invited to participate in the survey., Data on participants' demographic, socio-economic status, comorbidities, access to healthcare, difficulty in accessing medicines due to financial and non-financial (COVID-19 related) reasons, and treatment satisfaction were collected. Participants were asked if their diabetes symptoms worsened after lockdown. Data on self-monitoring of blood glucose, employment status, and household income were also collected using a pretested questionnaire.[11] Survey data were collected by trained field workers and captured using a Commcare application.

China—In Jiangsu province in China, a cross-sectional survey of 309 participants with diabetes was conducted in 10 communities in Kunshan and Taicang. During July—August 2020 when the COVID-19 pandemic in China was mitigated, trained community health station physicians conducted the face-to-face interviews, and data were collected using Qualtrics application. In addition, a cross-sectional survey among 394 participants with chronic disease was carried out across 3 sites in Shanghai, China. The team randomly selected 3 administrative regions, and then selected 1 community health service center in each of them. A convenience sampling survey was conducted among the outpatients in these sites from July—November 2020. Participants who were able to use smart phones, and without severe debilitating conditions, were included in the study.

Hong Kong—In Hong Kong, 30 cross-sectional bi-weekly telephone surveys were conducted among adults from June—December 2020, using random digit dialing to landline and mobile numbers at a 1:1 ratio. Among these surveys, information on chronic disease was available for 15 surveys conducted on alternate weeks starting from June 9, until December 30, 2020. Data on respondents' socioeconomic characteristics, including age,

occupation, education level, and household incomes were collected. Calls were made during both working and non-working hours to avoid over-representation of non-working groups with new respondents recruited for each survey round. Respondents were at least 18 years old and able to speak Cantonese Chinese or English. Detailed survey methods have been previously described.[12]

Republic of Korea—An online, cross-sectional survey of 910 participants in January 2021 was conducted to solicit information about access to healthcare services before and during the COVID-19 pandemic as well as occupations and other sociodemographic variables. Given the tendency of online surveys to attract a relatively young population, the survey used a quota sampling methodology to limit the number of respondents aged 40 or younger, and respondents were only invited to complete the full survey if they self-reported having been diagnosed with either diabetes mellitus or hypertension at least 2 years prior to January 2021. This survey explored the impact of the COVID-19 pandemic on access and health among working-age, mostly urban individuals in Korea.

Vietnam—In a Thai Nguyen provincial hospital, a cross-sectional survey among 497 patients with diabetes was conducted at the outpatient clinic between June and July 2020. A convenience sampling technique was applied and adults with diabetes and those registered at the hospital before January 2020 were invited to participate in the survey. The survey questionnaire was administered in person by trained medical students and lecturers at the Thai Nguyen University of Medicine and Pharmacy.

Data Analysis

Data were reported by study site and presented as a number (proportion) for categorical variables (eg, access to health facility; loss of job or income) and a mean (SD) for normally distributed continuous variables (eg, age). Each survey applied a threshold to indicate those of lower relative income in their sampled population. Multivariable logistic regression analyses were performed to find the factors associated with difficulty in accessing health care and worsening of diabetes symptoms. Two logistic regression models were constructed for the outcome: (1) "difficulty in accessing health care or medications," and, (2) "worsening diabetes symptoms"; the model was adjusted for demographic variables (age, sex, education, and income); chronic conditions (diabetes, hypertension, cardiovascular disease, and chronic kidney disease); and financial support from government (yes/no), loss of job (yes/no), and loss of income (yes/no) during the COVID-19 lockdowns. Data were analyzed separately by each center using Stata version 16.0 or R version 4.

Results

Overall, 5 countries recruited 5672 participants with chronic conditions (Table 1). In India, 1,734 out of 2,335 contacted participants (74.3% response rate) completed the survey. In Hong Kong, the survey response rate was 68.3%. In Korea, the response rate was lower as only 910 of 4,222 responded who met the age and medical condition inclusion criteria for the online survey (21.6%). Mean age (SD) of the study participants were comparable across the 5 countries/regions and ranged from 55.9 years (8.5) to 66.6 years (9.7) with nearly

half males, except for Korea which had two-third male participants. A substantial number of participants from India (59%), Hong Kong (41%), China, Jiangsu (30%), Shanghai (6.3%) and Vietnam, Thai Nguyen (19.1%) reported loss of income during the COVID-19 pandemic. The severity of the COVID-19 pandemic in 2020 and early 2021 varied across these study sites, as shown in eFigure 1 (supplemental material).[13] (**Panel C**).

Nearly half of the participants self-reported diabetes from India (43%), Shanghai, China (62.9%), Hong Kong (23.4%), and Korea (59%), whereas Jiangsu, China, and Vietnam recruited only patients with diabetes. Two-thirds of study participants had self-reported hypertension as it ranged from 54.1% in Hong Kong to 71.7% in Korea. A significant proportion of participants reported increased difficulty in accessing health care or medications in India (18%), China (Jiangsu 16%, Shanghai 10.5%), and Korea (24%), compared to Hong Kong (8%) and Vietnam (1.6%). One-quarter of the Korean sample reported difficulty in accessing health care or medications. The worsening of diabetes symptoms was reported by 10% to 14% participants across the other countries or regions (Table 2). Several sites also found patients with hypertension reported increased difficulty in access to anti-hypertensive medication and treatment (20.3% in India, 8.6% in Hong Kong, and 6% in Korea).

The multivariable regression model analyzing the factors associated with difficulty in accessing care or medications for chronic conditions found increasing age, female participants, worsened economic status were suggestive of an increased difficulty in access to care or medications, but these associations did not reach statistical significance in most cases (Table 3). In India, rural participants and those who experienced a loss of income reported statistically significant difficulty in access to care or medications, odds ratio (OR) (95%, confidence interval, [CI]): 2.55 (1.92, 3.39) and 2.57 (1.95, 3.39), respectively. Furthermore, individuals with self-reported hypertension and loss of job had significantly increased difficulty in access to care: OR (95% CIs): 1.49 (1.14, 1.93), and 1.66 (1.01, 2.73), respectively. In Jiangsu, China, people who lived in rural areas (OR = 4.24; 95% CI: 1.62-11.07), worsened in economic status (OR = 5.87; 95% CI: 2.57-13.42) were significantly more likely to report difficulty in accessing care or medications during the pandemic. Age, sex, education level, and household income were not associated with the difficulty both in Jiangsu and Shanghai, China. For both the PRC samples, access difficulty was also associated with less frequent glucose monitoring frequency, with increased difficulty in Jiangsu sample among those who reported glucose monitoring less than once per month (OR = 0.27; 95% CI: 0.10-0.76) and in the Shanghai sample among those who reported glucose monitoring 1 + times/week (OR = 3.14; 95%CI: 0.56, 17.71) or only 1 + times/month (OR = 3.14; 95% CI: 0.74, 13.31). In Hong Kong and Korea, younger people were more likely to report difficulty in accessing care, illustrating how the pandemic and measures to control it had widespread impact among those not directly infected with the virus and not usually considered vulnerable groups. Worsening economic status (loss of income) (OR = 1.13, 95% CI: 0.69-1.83 and household income below threshold (OR = 1.16, 95% CI: 0.73, 1.84) was associated with increased difficulty in Hong Kong, albeit not statistically significant. Receiving government financial support seemed to be protective, although also not significant (OR = 0.9, 0.5-1.5) in Hong Kong. Controlling for age, sex,

household income, place of residence and occupation, factors associated with difficulty in accessing care or medications during COVID-19 pandemic in Korea included being female (male OR [95% CI]: 0.43, 0.29-0.65), having diabetes (OR 95% CI: 1.68, 1.15-2.45). Rural residence or below-median income were suggestive of worse access but did not reach statistical significance.

eTable 1 shows the adjusted multivariable regression model results for factors associated with worsening of diabetes symptoms. No significant findings among various factors except the presence of some coexisting chronic diseases were noted in Hong Kong. Likewise, in India, no significant findings were noted for several covariates except comorbidities, that is, chronic kidney disease: OR (95% CIs): 4.21 (1.33, 13.37). In Korea, however, factors associated with worsening diabetes symptoms included younger age and being female (male OR = 0.40, 95% CI: 0.22-0.73).

Discussion

Routine screening, risk factor control and continuity of care among people with chronic conditions is a global challenge. This study conducted among 5 countries or regions (India, China, Hong Kong, Korea, and Vietnam) at different stages of epidemiological transition showed that people with chronic conditions faced significant challenges in managing their conditions during the COVID-19 pandemic, including loss of income and difficulties in accessing health care or medications; for a nontrivial portion, these factors are associated with worsening of diabetes symptoms. The heterogeneity in our study findings could be explained by factors such as differential severity of the COVID-19 pandemic and related mobility restrictions imposed in each of the countries or regions, and due to different patient populations, sampling frames (community-based versus clinic-based surveys), and data collection instruments.

Our study findings are consistent with previous reports that confirmed the adverse impacts of COVID-19 on chronic diseases.[14] The 2020 global survey of WHO in 155 countries showed that the COVID-19 pandemic disrupted essential prevention and treatment services for non-communicable diseases (49% for diabetes and diabetes related complications treatment).[15] Reductions in health services arose from mobility restrictions, lack of public transport, and lack of health workforce because of reassignment to COVID-19-related services. Several reports from the United States also indicate the disproportionate impacts of COVID-19 pandemic among racial and ethnic minorities.[16]

The COVID-19 pandemic has emerged as a major global challenge for people with chronic conditions. For example, data from Europe showed that more people with chronic conditions died at home due to the non-availability of important medical services, and due to the reallocation of health care resources to manage COVID-19.[17,18] This poses a double threat to people living in rural populations with limited access, availability, and affordability of health care services, and may further aggravate inequality in health outcomes. In addition, chronic diseases disproportionately affect older adults, which is of concern given the aging of the global population, especially in low- and middle-income settings. For example, in China, according to the 2020 census, the number of residents aged 60 and above reached

264 million, up 5.4% points from 2010.[19] A recent U.S. study found that among 5 states with most COVID-19 deaths also experienced a 96% increase in deaths due to diabetes, and an 89% increase in deaths due to heart diseases,[20] while a study in India found an association between state-level COVID-19 cases and deaths with diabetes, among other chronic conditions.[21] If the trend continues and no immediate actions are taken to mitigate pandemic impacts, the Asia Pacific region will struggle to achieve the 2030 Sustainable Development Goal (SDG) target 3.4 to reduce premature mortality from non-communicable diseases[22] by a third relative to 2015 levels and to promote mental health and wellbeing.[23]

Understanding the reasons for not seeking care is equally important to interpreting our study results and understanding their longer-term implications. For some of the study sites, pandemic effects intermingled economic losses with gains in time, with the latter leading to offsetting benefits from chronic disease management or self-care (ie, reduced opportunity cost of time), as has been found for some previous economic recessions.[24] For example, among Korea's respondents with diabetes, 22% listed lack of time as a main constraint on receiving diabetes treatment (a decline from 30% before the pandemic), while 30% listed economic reasons (up from 20% prepandemic). However, older workers and those with chronic disease have been less likely to experience such offsetting benefits even prior to the COVID-19 pandemic, and women and vulnerable groups have often been disproportionately impacted.[25,26]

To effectively triage the COVID-19 pandemic and provide timely care for people with chronic conditions such as diabetes and hypertension, we propose the following measures that can be implemented in resource constrained settings as well. (1) Innovations in health care delivery models and use of digital health apps to disseminate information on how to adopt healthy lifestyle changes and self-management of chronic disease and COVID-19 with mild symptoms. (2) Increased investment in community support interventions to provide social and economic support to disadvantaged populations, which could help mitigate future infectious disease outbreaks. (3) Strengthening primary health care infrastructure, training of community health workers, and financial incentives to healthcare providers can potentially help mitigate the impacts of future outbreaks. Due to the recent shift in health care delivery through phone or video consultations,[27,28] future studies should evaluate the effectiveness of technology-assisted health services among patients with complex chronic diseases that require in-person consultations.

Strengths and Limitations

To the best of our knowledge, this is the first report comparing the impacts of the COVID-19 pandemic and mobility restrictions on people with chronic conditions from 5 countries/regions at different stages of socio-demographic and economic transitions. Survey participants (except in Vietnam) were randomly selected from the community and included participation from both sexes, and urban and rural settings (except Hong Kong) to improve generalizability of study results. Pretested validated questionnaires were used by most of the teams.

This study has several limitations. First, although the study samples were randomly selected except in Vietnam, generalizability of the study results should be carefully considered due to different sampling techniques, differences in the approach to measurement of socio-economic impact of COVID-19 pandemic, and the variation in the date of the surveys; all these might account for some of the observed variation and affect cross-country comparisons. Second, the causality between the factors associated with difficulty in accessing care and worsened diabetes symptoms are difficult to infer from this study alone due the cross-sectional study design. Third, for Korea the online survey had a low response rate. The age/sex distribution of respondents may affect the generalizability of results, as another national study found that younger people and males were less likely to avoid visiting hospitals during the COVID-19 pandemic.[8] Fourth, in Thai Nguyen, Vietnam, patients were surveyed at the outpatient clinic so we could not generalize these results for patients with diabetes who could not visit the clinic. Lastly, no objective measures related to worsened diabetes symptoms were included in this study. Therefore, future research should consider analyzing the long-term impact of the COVID-19 pandemic using objective measures of diabetes-related outcomes.

Conclusion

The COVID-19 pandemic is associated with substantial variation in difficulty in health care access and worsening of diabetes symptoms, with disproportionate impact on marginalized and rural populations in Asia. The pandemic's broad social and economic impact has adversely affected population health well beyond those directly suffering from COVID-19, with the resulting delayed and foregone care leading to uncertain longer-term effects. Mitigating the unintended adverse consequences of the COVID-19 pandemic on chronic disease care remains a global health priority.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Data Sharing Statement

Data are available on reasonable request. All data relevant to the study are included in the article.

Appendix

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What We Already Know

- The COVID-19 pandemic and related mobility restrictions continues to cause disruptions in health service delivery, leading to reduced healthcare utilization particularly among those with chronic conditions such as diabetes, although patterns differ by age, sex, and residence.

- There is limited data comparing the COVID-19 pandemic's impact on access to care and worsening of diabetes symptoms at the population level in multiple Asian countries.

What This Article Adds

- This is the first report comparing the impacts of the COVID-19 pandemic and mobility restrictions on people with chronic conditions from 5 Asian countries/regions at different stages of socio-demographic and economic transitions.

- This study found that the COVID-19 pandemic is associated with substantial variations in the difficulty in accessing care and worsening of diabetes symptoms, with disproportionate impact on marginalized and rural populations in Asia.

- The pandemic's broad social and economic impact has negatively affected population health well beyond those directly suffering from COVID-19, with uncertain longer-term implications of the resulting delayed and foregone care.

Table 1.

Characteristics of Study Participants.

	India (N = 1734)	China, Jiangsu (N = 309)	China, Shanghai (N = 394)	Hong Kong (N = 1828)	Korea [a] (N = 910)	Vietnam (N = 497)
Setting/sampling frame						
Existing cohort of those with chronic disease	Yes	Yes	—	—	—	—
Jurisdiction-wide survey by phone or online	—	—	—	Yes	Yes	—
Sample of patients at outpatient clinic	—	—	Yes	—	—	Yes
Participant's characteristics						
Age (mean, SD)	57.8 (11.3)	63.1 (7.9)	69.3 (8.3)	64.5 (15.0)	55.9 (8.5)	66.6 (9.7)
Age group (%)						
<45	12.1	0.3	0.0	10.7	9.8	3.0
45-55	30.5	14.9	5.6	11.4	32.3	8.0
56-65	32.7	38.2	23.6	23.6	50.7	36.0
66-75	19.4	41.4	50.0	32.2	7.0	36.0
75 +	5.3	5.2	20.8	22.1	0.2	17.0
Male (%)	49.7	47.6	41.6	43.4	66.4	45.0
Place of residence (%)						
Rural	76.9	57.6	0.0	-	6.53	28.0
Urban	23.1	42.4	100.0	100.0	93.5	72.0
Education (%)						
Below primary	16.9	38.5	0.5	5.9	-	5.6
Primary	6.90	17.2	8.4	24.3	-	16.3
Secondary	56.4	42.4	66.2	48.9	-	61.0
College and above	19.7	1.9	24.9	20.6	-	17.1
Household income (%)						
Below threshold	13.4	20.4	20.8	31.6	30.0	30.0 [b]
Above threshold	86.6	79.6	79.2	68.4	70.0	70.0 [b]
Change in economic status						
Worsened (loss of income) (%)	59.3	30.3	6.3	41.1	—	19.1
Pandemic severity in jurisdiction						

	India (N = 1734)	China, Jiangsu (N = 309)	China, Shanghai (N = 394)	Hong Kong (N = 1828)	Korea[a] (N = 910)	Vietnam (N = 497)
COVID-19 cases per million population (by August 31, 2020)	3.7	0.0007	0.0009	0.005	0.02	0.001
COVID-19 deaths per million population (by August 31, 2020)	0.07	0	0.000007	0.00009	0.0003	0.00003
Oxford COVID-19 Government Response Stringency Index (Mean of June-August, 2020)	78.4	77.5	77.5	68.3	59.8	63.9

[a] For Korea, rural residence is proxied by living 2 or more hours from a hospital. Rather than educational attainment, the Korea survey asked for occupation: 16.3% were managers and professionals; 30.1% were clerical, sales and other services; 5.4% were technicians in manufacturing; 27.5% were unemployed/nonemployed; and the remainder reported other occupations.

[b] For Vietnam, information about household income was only asked of those 341 participants (68.6%) who received an income or salary before COVID-19; among them, the majority (64.8%) were below the official 5000000 VND (213 USD) per month. For further explanation of site-specific household income thresholds, see the text.

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Table 2.

COVID-19 and Chronic Disease.

	India (N = 1734)	China, Jiangsu (N = 309)	China, Shanghai (N = 394)	Hong Kong (N = 1828)	Korea (N = 910)	Vietnam (N = 497)
Diabetes mellitus (%)	42.8	100.0	62.9	23.4	58.7	100.0
Increased difficulty in medication and treatment access (%)	18.0	16.2	10.5	8.2	24.3	1.6
Diabetes symptoms worsened (%)	13.1	6.5	5.6	9.4	14.6	3.0[a]
Glucose monitoring frequency (%)						
1 + times/day	0.6	1.3	15.7	—	20.4	2.2
1 + times/week	7.9	5.7	33.5	—	34.6	8.2
1 +times/month	19.1	77.1	30.6	—	18.0	50.7
Fasting blood sugar monitoring (%)	55.7	98.7	—	—	87.5	—
HbA1c monitoring (%)	4.7	33.0	—	—	81.8	—
Hypertension (%)	56.2	70.6	63.5	54.1	71.7	64.8
Blood pressure monitoring (%)	52.8	—	—	—	58.8	76.1
Increased difficulty in hypertension medication and treatment access (%)	20.3	—	—	9.0	6.0	0.3
COVID diagnosis (%)						
Individual	2.7	0	0	0	0	0
Family	3.0	0	0	0	0	0

[a]For Vietnam, respondents were accessing outpatient services at the site of the interview, and "diabetes symptoms worsened" was based on a positive answer to the question "During the Covid-19 pandemic, were you admitted to hospital due to diabetes mellitus or related diseases?"

Table 3.

Factors Associated With Difficulty in Accessing Care or Medications for Chronic Disease During COVID-19 (Due to COVID-19 Situation or Financial Reasons).

	India (N = 1,594)	China, Jiangsu (N = 309)	China, Shanghai (N = 248)	Hong Kong (N = 1828)	Korea[3] (N = 910)
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Age group					
< 45	1.00	—	—	1.00	1.00
45-55	1.23 (0.81-1.87)	1.00	1.00	1.49 (0.74-3.01)	0.26 (0.15-0.44)
56-65	1.06 (0.69-1.63)	2.45 (0.78-7.67)	0.89 (0.11-7.16)	0.46 (0.21-1.00)	0.19 (0.11-0.32)
66-75	1.37 (0.87-2.18)	1.81 (0.55-5.94)	0.86 (0.21-3.56)	0.56 (0.26-1.21)	0.10 (0.03-0.27)
75 +	1.11 (0.57-2.18)	—	0.70 (0.19-2.57)	0.40 (0.16-0.98)	—
Male	0.85 (0.65-1.10)	0.60 (0.26-1.33)	1.27 (0.51-3.18)	0.60 (0.38-0.94)	0.43 (0.29-0.65)
Place of Residence					
Rural	2.55 (1.92-3.39)	4.24 (1.62-11.07)	—	—	1.51 (0.53-4.29)
Urban	1.00	1.00	—	—	1.00
Education					
Below primary	1.00	1.00	1.00	1.00	—
Primary	1.18 (0.71-1.95)	1.33 (0.50-3.57)	—	0.83 (0.31-2.20)	—
Secondary	0.97 (0.69-1.37)	0.53 (0.20-1.44)	1.76 (0.26-12.05)	0.57 (0.21-1.56)	—
College and above	0.8 (0.49-1.31)	—	1.48 (0.43-5.12)	0.56 (0.19-1.65)	—
Change in Economic Status					
Worsened	2.57 (1.95-3.39)	5.87 (2.57-13.42)	0.26 (0.05-1.45)	1.13 (0.69-1.83)	—
No change	1.00	1.00	1.00	—	—
Household Income					
Below threshold	1.00	1.00	1.00	1.00	1.00
Above threshold	0.75 (0.58-0.98)	0.43 (0.17-1.11)	0.93 (0.28-3.11)	1.16 (0.73-1.84)	0.86 (0.57-1.28)
Diabetes Mellitus	—	—	—	0.74 (0.43-1.25)	1.68 (1.15-2.45)
Received government financial support	—	0.35 (0.07-1.66)	—	0.91 (0.53-1.54)	—
Experienced loss of job in the family during the pandemic	1.66 (1.01-2.73)	—	—	—	—

Abbreviations: CI, confidence interval; OR, odds ratio.

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[a]For Korea, given the younger age distribution of the sample, the final age category is 66+; the reference category for place of residence was Seoul, with a lower risk in other large cities (0.61 [0.38, 0.97]) and smaller cities (0.64 [0.42, 0.97]); and the Korea estimate for "worsened economic status" is for those unemployed (relative to other reported occupations, with employed as professional [class 1] as the reference category). The Korea regression also controlled for other occupations (Classes 2 and 3) and place of residence in metropolitan areas versus other; none of those estimates were statistically significant.