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Research Article

Could Governmental Interventions Improve Subjective Well-Being During the COVID-19 Pandemic? Findings from 750 Street Vendors in Cali, Colombia

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Ming Guan[1]

1. Xuchang University, Jiangguanchi, China

Psychosocial well-being during the Coronavirus disease 2019 (COVID-19) pandemic had been reported in the world. But, less knowledge about the role of governmental interventions was explored in a country with civil conflicts. The present study aims to investigate the association of governmental interventions with psychosocial well-being and their moderators in Colombia. The mean age of study participants was 51.05 years (SD=±13.64, N=747) and 50.53% were men. Street vendors were likely to be mentally vulnerable in the ongoing COVID-19 pandemic. Economic support from the government (adjusted odds ratio (aOR)=0.683, 95% confidence interval (CI): 0.443, 1.054), subsidy beneficiary (aOR=0.597, 95% CI: 0.412, 0.867), governmental opening of business places and dates (aOR=0.429, 95% CI: 0.311, 0.593), access to governmental programs (aOR=0.442, 95% CI: 0.312, 0.627) was significantly associated with yesterday depression, respectively. Simple slope analysis revealed that when average work hours per day were longer, the benefits of access to governmental programs on increased mental disorders was stronger. Thus, most of street vendors experienced war trauma, business difficulties, and mental disorders and distrusted in governmental agencies, police, council, and service. This study highlighted the importance of lengthening average work hours per day in improving mental and physical health among the street vendors.

Background

The ability to survive through the COVID-19 pandemic likely affects the survival and development of a country. The COVID-19 impact was having on economies and businesses, and global health system[1]. It was reported the levels of general subjective well-being were disproportionately distributed across different groups during the COVID-19 pandemic in the UK[2].The important factors influencing the satisfaction of citizens concerning their governments' battle against the COVID-19 pandemic were reported in Japan and South Korea[3]. If overlapping civil conflicts and poor economic situation, people at the bottom of society will face poor subjective well-being. This article focuses on

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concurrent calamities and explains how government interventions healed the psychological pain among the common informal workers.

A systematic review reported the economic effects of the COVID-19 pandemic on small businesses[4]. Moreover, the prevalence of COVID-19 had caused a lot of damage to the rural tourism industry[5], hotel industry in Vietnam[6], and small business owners in China[7]. COVID-19 also had caused a significant decline in labor demand[8] and employment instability[9]. It was estimated that COVID-19 crisis led to decrease in the number of new apprenticeship positions in the German apprenticeship market[10]. COVID-19 crisis led to large losses in revenues, increased expenditures, and layoffs in the United States[11]. A study in Philippines found members of informal communities were especially vulnerable to contracting COVID-19 due to precarious livelihoods, housing instability, disenfranchisement, stigmatization, policing and criminalization[12]. With respect to negative mental health and job unemployment, the COVID-19 pandemic had significant impacts on the society's wellbeing in Malaysia[13].

To effectively target and sustain businesses, many countries provided COVID-19 financial support to small businesses (eg. Switzerland[14]). In the short term, government support schemes for small firms were deemed effective during the COVID-19 pandemic in Macao[15]. Considering scarring effect and loan demand, a study in the UK showed the importance of government-backed lending schemes for small businesses during COVID-19 crisis period[16].

Accordingly, governmental interventions played a vital role in business survival during the COVID-19 pandemic. However, we had little knowledge about the mental outcome of informal workers. Further, accompanied by other risk factors like civil conflicts, whether government interventions could mitigate mental disorders need to be confirmed. Likewise, which policy tool could solve a specific mental problem should also be identified in a specific country. Here, we took Colombia as an example to explore the relationships of interest.

Literature review

Colombia had been one of the Latin American countries most affected by the COVID-19 pandemic[17]. Colombia had lost over 138,000 COVID-19 deaths and experienced the worst economic recession in its history the end of February 2022[18]. With high infection ratio[19], the arrival of COVID-19 was currently overlapping with dengue in Colombia[20]. Recent studies concluded that COVID-19 pandemic led to high prevalence of perceived stress[21] and subsequently caused high suicide risk in the Colombian population[22]. The pregnant women[23], older adults[24], and the poor[25] were susceptible to infection by COVID-19 virus.In response to Colombia stability, the health effects of COVID-19 pandemic on business activities need to be focused on.

Studies indicated the historical context of 60 years of unrelenting armed conflict led to poor mental health among the internally displaced persons[26][27][28][29] and significant population burden of alcohol misuse and illicit drug use[30] in Colombia. Internal displacement resulting from armed conflict increased the needs in mental health care services in Colombia[31]. After the signing of Colombia's Peace Agreement in 2016, conflict and socioeconomic inequalities still contributed to persistent adverse mental health outcomes in the overall population[32]. The economic crisis induced by continuing conflicts can have a serious impact on population health. Accompanied by COVID-19 pandemic, the society is experiencing well-being tragedy.

Street vendors accounted for the largest share of employment in Colombia. The creation of informality in Colombia could be traced to ongoing Colombian civil war since 1964. It was confirmed regional heterogeneity in the incidence of informality was one of important sources of regional wage inequality in Colombia[33]. The informal sector was closely tied to the formal economy and the State's welfare functions in downtown Cali, Colombia[34]. The very high level of informal labour in Colombia was caused by high minimum wage[35]. The street vendors in Bogotá, Colombia expressed satisfaction with their job and dissatisfaction with not having the opportunity to access other types of work[36]. Most of the street vendors in Cali depended on payday loans and were unable to escape poverty[37]. Informal workers not covered by social security systems had lower subjective well-being than workers in the formal economy in Colombia[38]. Thus, irregular business can not change the lives of informal workers.

COVID-19 pandemic deteriorated the situation in Colombia. Colombia had been experienced changed

purchase behavior, increased unemployment rates, collapsed health systems, and interrupted supply chains during the COVID-19 pandemic[39]. Meanwhile, COVID-19 pandemic worsened poverty[40], maternal mental health[41], socioeconomic inequalities[42], and dysfunctional eating patterns[43] in Colombia. Even worse, Cali's recent turbulent period of popular protests against the government favored the spread of COVID-19 epidemiology[44]. Daily violence in urban space was reported in Buenaventura, Colombia[45]. Mining-related violence had intensified in mining regions in Northeastern Antioquia, Colombia[46]. Thus, experiences of the common street vendors could reflect real well-beings improvement in the whole society.

In this study, we guess some specific governmental interventions were associated with psychological well-beings. The primary aim of the present study was to examine how socioeconomic factors, business factors, political factors, and pandemic factors influenced the associations between governmental interventions and subjective well-being during the COVID-19 pandemic. Using a sample of 750 street vendors in Cali, Colombia, we hypothesized some specific socioeconomic factors, business factors, political factors, pandemic factors moderated the associations governmental interventions and subjective well-being.

Methods

Ethics statement

The surveys before implementation were approved from the Ethics Committee of Universidad Icesi, Glasgow Caledonian University (code # 348). The informed consent for academic purposes was obtained from each voluntary participant before taking the telephone survey. The survey did not include any experimentation with human subjects.

Study settings and sampling methods

This study employed a publicly available survey data in Cali, Colombia[47]. Given the restrictions imposed by COVID-19, data collection was conducted from March and May 2021 via telephone. Through purposive and snowball sampling, a total of 15 leaders of street vendors' associations were recruited. The researchers in Cali explained the purpose of the study, and requested the participation of association members. Leaders communicated the purpose of the study to their association members and began collecting phone numbers of individuals who were willing to participate, which were given to researchers to contact respondents, who then referred pollsters to additional potential respondents. Participants gave their consent to use the information collected in the study for academic purposes. No personal information (name, ID number, address, or working location) was asked to assure confidentiality. Meanwhile, the phone survey typically lasted about 20 minutes with a 50% response rate. In the survey, 750 informal workers-street vendors answered all the other questions with respect to demographic data, home and children, economic activity, income and expenses, access to financial services and debt, institutional trust, health, and subjective well-being. With 4 pages and 56 questions, the eight survey topics were demographics, home and children, economic activity, income and expenses, access to financial services and debt, institutional trust, health, and subjective wellbeing.

Socioeconomic factors

Socioeconomic factors were age (years), gender (male/female), socioeconomic strata (1=the poorest and 6=the most affluent), ethnicity (white, multi-racial, native, black/Afro, other, none), health insurance scheme affiliated (contribute, subsidized, beneficiary, special, none, DK); contribution to health and pension (only to health, only pension, both, none, and pensioner), performed as control variables.

Age was calculated by 2021 minus birth year (unit=years). For the purpose of comparative study, age was grouped by young cohort (<=39 years old), middle-aged cohort (40-59 years old), and older cohort (>=60 years old). According the statistical distribution (1: 43.20%, 2: 37.33%, 3: 18.67%, 4: 0.67%, 5: 0.13%, Total: 750), socioeconomic strata was recoded as SES1 (=1), SES2 (=2), and SES3-5 ($\geq$3). According the statistical distribution (white: 22.13%, multi-racial: 40.67%, native: 5.87%, black/Afro: 24.67%, other: 5.07%, none: 1.60%, Total: 750), a binary variable of multi-racial ethnicity was recoded as no (=0) and yes (=1). On the basis of the statistical distribution (contribute: 10.80%, subsidized: 63.33%, beneficiary: 14.00%, special: 0.80%, none: 9.47%, DK: 1.60%, Total: 750), health insurance scheme affiliated was recoded as non-subsidized (=0) and subsidized (=1). According the statistical distribution (only to health: 9.87%, only pension: 0.93%, both: 2.53%, none: 85.33%, pensioner: 1.33%, Total: 750),

contribution to health and pension was recoded as yes (=0) and none (=1).

Multiracial ethnicity, rented house, subsidized scheme, head of household, number of children, debts or loans before pandemic, unemployment 90+ days, insufficient resources for livelihood, bad income, application for a loan were binary variables with response options of no (=0) and yes (=1). Number of family members was dichotomised into <4 and >=4.

Business factors

Business factors were working years, average days per week, average hours work per day, daily sales, and daily earnings. They were reflected by the questions: "How long have you been working as a street vendor?", "On average, how many days per week can you work during the current crisis?", "On average, how many hours do you work per day?", "Currently, how much are your daily sales on average (Colombian Peso)?", and "Currently, how much are your daily earnings on average (Colombian Peso)?", respectively. Some answers for average working hours per day more than 24 hours were treated as missing values.

Political factors

Political factors included institutional distrust, police persecution, dissatisfaction with government, and dissatisfaction with occupation. Institutional distrust included level of distrust in various institutions in the city: municipal council, national police, and civil service. The answer was assessed on a scale of zero (not at all) to ten (always). Thus, the answers of distrust in municipal council, national police, and civil service were recoded as yes (<=5) and no (>5). Among the 750 participants, the distribution of police persecution towards business was uneven (increased: 22.27%, decreased: 18.00%, no victim: 59.73%). Thus, a binary variable of police persecution was recoded as no (=0) and yes (=1).

Satisfaction with government was measured by a question: "Overall, how satisfied are you with the government's management during the pandemic?" with the response options of not satisfied (=0) to very satisfied (=10). Here, the answers of dissatisfaction with government were recoded as yes (<=5) and no (>5).

Pandemic factors

Pandemic factors included pandemic disease, COVID-19 disease, inaccessible care, family member lost, hungry sleep. They were reflected by the questions: "Since the pandemic started, have you or someone in your household gotten sick from COVID-19 or some other disease?" with the response options of yes and no, "Did you get sick with COVID-19 or another disease?" with the response options of COVID-19 and another disease, "If you or a family member has gotten sick, have you been able to go to a medical center? " with the response options of yes, no, and no need medical attention, "Have you lost a family member or close person as a result of the pandemic?" with the response options of yes and no, and "Have you or someone in your household gone to bed hungry during the pandemic?" with the response options of yes and no. The response options of the second question were recoded and obtained the variable of COVID-19 disease with the response options of no (=0) and yes (=1). The response options of the third question were recoded and obtained the variable of inaccessible care with the response options of yes/no need medical attention (=0) and no (=1).

Governmental interventions

Governmental interventions included economic support from government, subsidy beneficiary, governmental opening of business places and dates, and access to governmental programs. The first three variables were reflected by the three questions with response options of no (=0) and yes (=1): "Do you feel support from the government regarding the economic situation of your home?", "Are you a beneficiary of any subsidy and / or benefit promoted by the State? (Families in Action, Colombia Mayor, Solidarity Income or other.)", and "Has the government been clear with the opening of the places and the dates in which you can carry out your work?" respectively. The fourth variable was reflected by the the question: "Do you have access to any of the following programs?" The response options were job placement programs, education develop skills for a new job, employment insurance, government provided social housing, monetary subsidies, and affordable, good quality public schools for children. They had the response options of "no" and "yes". In the sample, the informal workers have access to job placement programs (3 households), education develop skills for a new job (6 households), employment insurance (10 households), government provided social housing (22 households), monetary subsidies (137 households), and affordable, good quality public schools for children (137 households). A new variable was created by summing up the participating into the programs and defined as number of supporting programs with

the distribution with 0 (65.07%), 1(28.93%), 2(5.20%), 3(0.67%), and 5(0.13%). Thus, a binary variable, access to supporting programs, could be obtained with the response options of yes (34.93%) and no (65.07%).

Subjective well-beings

Main outcome variables were dissatisfaction with occupation, dissatisfaction with life, increased mental disorders, yesterday unhappiness, yesterday worriedness, and yesterday depression.

Satisfaction with occupation was measured by a question: "Are you satisfied with your current occupation?" with the response options: Yes, No, and DK. Thus, the answers of dissatisfaction with occupation could be recoded as yes (=No) and no (=Yes and DK).

Life dissatisfaction was measured by the question: "In general, how satisfied are you with all aspects of your life?" Their response options were from not satisfied (=0) to very satisfied (=10). For statistical convenience, the variables were recoded as yes (<=median=5) and no (>median=5).

Increased mental disorder was assessed subjectively using a single item: "Do you feel that in the last few days your anxiety and stress levels have increased?" Participants recorded their response to this item on a 11-point Likert-type scale where 0 = "completely disagree" and 10 = "completely agree". For statistical convenience, the variables were recoded as no (<=median=5) and yes (>median=5).

Three questions about yesterday unhappiness, yesterday worriedness and yesterday depression were scored on an 11-point Likert scale from 0 (in any moment) to 10 (all the time). For statistical convenience, the variables were recoded as yes (<=median=5) and no (>median=5).

Statistical analyses

Names, abbreviation, and contents of the main variables could be seen in Supplementary Table 1. Simultaneously, the percentages were employed to expound the statistical characteristics of the sample. In the tentative analyses, associations of socioeconomic factors with business factors, institutional factors, pandemic factors, and governmental factors were conducted by logistic regressions.

Subsequently to examine the impact of governmental variables on subjective well-being, we first tried to identify the confounding factors. In a stepwise fashion of change-in-estimate criterion (> 0.09% cutoff)[48], the potential confounding factors with Stata program "confnd"[49] were identified and screened out in the associations between governmental variables and subjective well-being. After screening out the potential confounding factors, multiple logistic regression models of interest were conducted to identify significant covariates. Here, risks were expressed as adjusted odds ratio (AOR) with 95% confidence interval (CI). Subsequently, moderating effects of governmental variables were analysed with SPSS software.

As a result, some of the socioeconomic factors, business factors, political factors, and pandemic factors possibly were significant in the logistic regressions of interest. Thus, they were the moderators for the associations of a specific governmental intervention with a specific psychological well-being. Further, simply slope analyses were performed to reflect the moderating effects.

Results

Descriptive characteristics of the sample

The mean age of participants was 51.05 years (n=747) ranging from 19 to 81 years. Among the 750 participants, 50.53% were males, 40.67% were multi-racial, 46.40% rented houses, 63.33% were subsidized by health insurance scheme, 85.33% did not contribute to health and pension, 72.67% were heads of household, 50.00% had 4 and more persons in their families, and 86.93% had 1 and more children. Furthermore, 57.60% were satisfied with their current occupation.

There were high prevalence of dissatisfaction with occupation (31.07%), bad income (47.07%), debts or loans before pandemic (32.67%), application for a loan during the pandemic (21.47%), distrust in municipal council (75.20%), distrust in national police (72.93%), distrust in civil service (72.80%), police persecution (40.27%), dissatisfaction with government (65.87%), pandemic disease (25.87%), COVID-19 disease (15.07%), family member lost (8.80%), hungry sleep (21.60%), dissatisfaction with life (28.93%), increased mental disorders (66.27%), yesterday unhappiness (38.40%), yesterday worriedness (58.40%), and yesterday depression (23.33%) in the sample.

Among the 750 participants before the pandemic, 56.13% consider their incomes were good enough income to cover basic needs and save, followed by 41.60% regular enough to just cover the basic needs and 2.27% not enough to cover basic needs. The unemployed days during the quarantine was distributed as 0 days (0.40%), <30 days (3.60%), 30-60 days (21.87%), and +90 days (74.13%).

Among the 750 participants, 35.73% could not obtain sufficient resources for the livelihood, while 45.47% sometimes could obtain sufficient resources for the livelihood. 97.20% household income had been reduced due to the pandemic. In order to compensate for the reduction in income, they developed another economic activity (203 participants), drew on your savings (202 participants), asked for help from family or friends (364 participants), got into debt (146 participants), received financial support from the state (subsidies) (90 participants), and reduced expenditures (210 participants). 47.07% of the sample thinks their current income was bad to cover basic needs and save.

Among the 750 participants, 32.67% have some debts or loans before the pandemic, while 21.47% have applied for a loan during the pandemic. 20.93% feel supports from the government regarding the economic situation of your home.22.93% were beneficiaries of any subsidy and / or benefit promoted by the State. 47.47% the government been clear with the opening of the places and the dates in which you can carry out your work. In their opinions, finance inclusion (26.00%), work- training programs (29.60%), education programs (23.60%), relocation (13.87%), increasing formal employment (36.93%), subsidies for housing (46.40%), subsidies-compensatory income (64.13%), food (60.53%), regulations to allow informal workers continue working on their current occupation (48.40%) should be the government priority to alleviate the current conditions of informal workers. 69.73% belong to an informal workers association. Since the pandemic started, 25.87% households have family members gotten sick from COVID-19 or some other disease.

Basic demographic characteristics and the prevalence of negative subjective well-being were presented in Supplementary Tables 2 to 7. In Supplementary Table 2, there were significant dissatisfaction with occupation differences in the case of age categories, rented house, debts or loans before pandemic, income before pandemic, unemployed 90+ days during the quarantine, insufficient resources for livelihood, bad income, distrust in civil service, dissatisfaction with government, hungry sleep, governmental opening of business places and dates, increased mental disorders, and yesterday unhappiness. In Supplementary Table 3, there were significant dissatisfaction with life differences in the case of age categories, socioeconomic strata, rented house, subsidized scheme, debts or loans before pandemic, income before pandemic, bad income, distrust in municipal council, distrust in national police, distrust in civil service, dissatisfaction with government, COVID-19 disease, inaccessible care, hungry sleep, economic support from the government, subsidy beneficiary, dissatisfaction with occupation, yesterday unhappiness, yesterday worriedness and dissatisfaction with life. In Supplementary Table 4, there were significant increased mental disorders differences in the case of gender, multiracial ethnicity, subsidized scheme, number of children, debts or loans before pandemic, unemployed 90+ days during the quarantine, insufficient resources for livelihood, bad income, police persecution, hungry sleep, yesterday unhappiness, yesterday worriedness, and dissatisfaction with life. In Supplementary Table 5, there were significant yesterday unhappiness differences in the case of age categories, socioeconomic strata, rented house, subsidized scheme, number of children, debts or loans before pandemic, income before pandemic, bad income, distrust in municipal council, distrust in national police, distrust in civil service, dissatisfaction with government, COVID-19 disease, family member lost, hungry sleep, dissatisfaction with occupation, increased mental disorders, yesterday unhappiness, yesterday worriedness, and dissatisfaction with life. In Supplementary Table 6, there were significant yesterday worriedness differences in the case of age categories, socioeconomic strata, subsidized scheme, number of children, income before pandemic, unemployed 90+ days during the quarantine, bad income, application for a loan during the pandemic, distrust in civil service, hungry sleep, increased mental disorders, yesterday unhappiness, yesterday worriedness, and dissatisfaction with life. In Supplementary Table 7, there were significant yesterday depression differences in the case of head of household, debts or loans before pandemic, unemployed 90+ days during the quarantine, insufficient resources for livelihood, bad income, application for a loan during the pandemic, dissatisfaction with government, family member lost, hungry sleep, governmental opening of business places and dates, access to governmental programs,

increased mental disorders, yesterday unhappiness, yesterday worriedness and dissatisfaction with life.

Relationship between time use and business performance

In Figure 1, relationship between years of working as a street vendor and daily sales was expressed by the equation: $Y= 44238 + 1103.5 X - 25.577 X^2$, ($N = 750$, $R^2 = 0.8\%$, RMSE = 57243.41054). In Figure 2, relationship between years of working as a street vendor and daily earnings was expressed by the equation: $Y = 19297 + 308.29X - 9.1591 X^2$, ($N =749$, $R^2 =1.0\%$, RMSE =23832.74798). In Figure 3, relationship between average working days per week during the current crisis and current daily sales on average: $Y = 10917 + 11814 X - 730.05 X^2$, ($N =749$, $R^2 =2.2\%$, RMSE =56864.79001). In Figure 4, relationship between average working days per week during the current crisis and current daily earnings on average: $Y = 315.43 + 6994.3 X - 565.65 X^2$, ($N =748$, $R^2 =2.4\%$, RMSE =23684.56271). In Figure 5, relationship between average working hours per day during the current crisis and current daily sales on average: $Y = 10873 + 5033.8 X - 52.87 X^2$, ($N =747$, $R^2 =3.1\%$, RMSE =56642.41009). In Figure 6, relationship between average working hours per day during the current crisis and current daily sales on average: $Y = 2853 + 2947.4 X - 104.81 X^2$, ($N =746$, $R^2 = 2.1\%$, RMSE =23742.86225). From Figures 1 to 5, we found long years of working could not lead to high daily sales and earnings on average during the current crisis. But, long average working days per week and average working hours per day could result in slight increase in sales and earnings.

Figure 1. Relationship between years of working as a street vendor and current daily sales on average

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Figure 2. Relationship between years of working as a street vendor and current daily earnings on average

doi.org/10.32388/UNoNM5

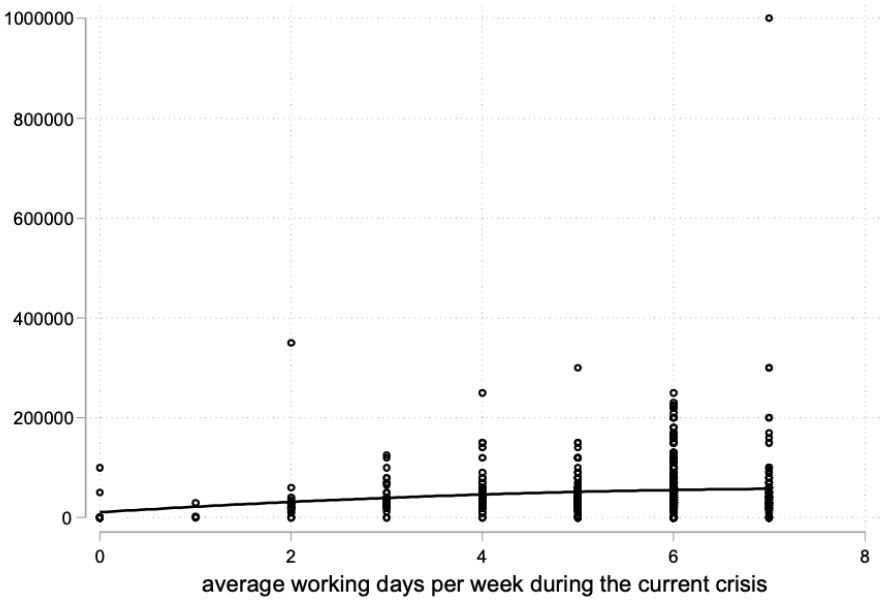

Figure 3. Relationship between average working days per week during the current crisis and current daily sales on average

doi.org/10.32388/UNoNM5

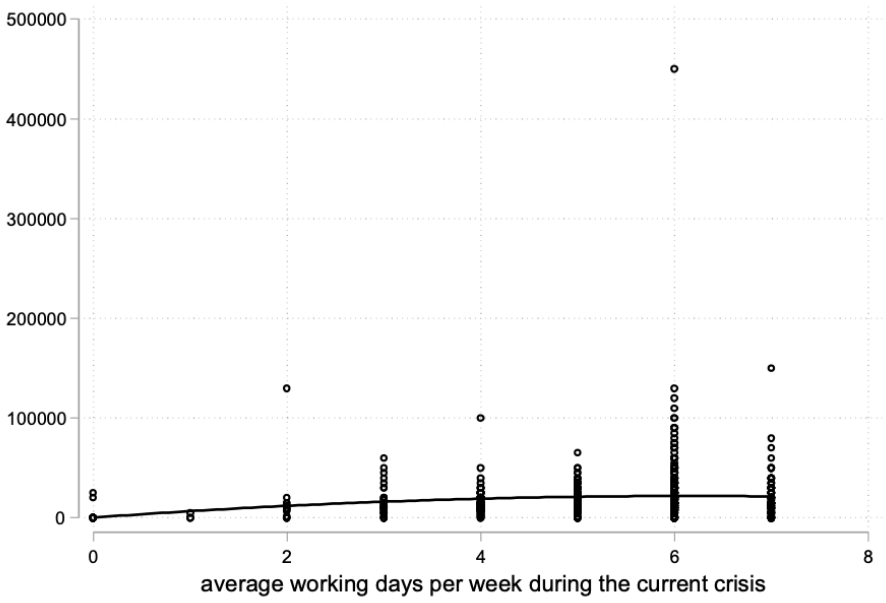

Figure 4. Relationship between average working days per week during the current crisis and current daily earnings on average

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Figure 5. Relationship between average working hours per day during the current crisis and current daily sales on average

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Figure 6. Relationship between average working hours per day during the current crisis and current daily sales on average

Associations between governmental interventions and subjective well-being

On the basis of change-in-estimate calculation in Supplementary Table 8, the potential factors associated with subjective well-being could be identified.

In Table 1, economic support from the government (aOR=0.723, 95% CI: 0.492-1.062), subsidy beneficiary (aOR=0.697, 95% CI: 0.476-1.020), governmental opening of business places and dates (aOR=0.451, 95% CI: 0.329-0.619) was significantly associated with dissatisfaction with occupation, respectively. Daily earnings on average possibly moderated these associations.

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	Model 1		Model 2		Model 3		Model 4	
	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI
Economic support from government	Ref.=No				Ref.=No		Ref.=No	
Yes	0.723*	0.492-1.062			0.946	0.615-1.456	0.768	0.505-1.167
Subsidy beneficiary			Ref.=No					
Yes			0.697*	0.476-1.020				
Governmental opening of business places and dates					Ref.=No			
Yes					0.451***	0.329-0.619		
Access to governmental programs					Ref.=No		Ref.=No	
Yes					0.904	0.627-1.305	0.833	0.581-1.195
Daily earnings on average	1.000***	1.000-1.000	1.000**	1.000-1.000	1.000***	1.000-1.000	1.000***	1.000-1.000
Family member lost			Ref.=No					
Yes			1.024	0.581-1.806				
Rented house					Ref.=No			
Yes					1.157	0.865-1.547		
Yesterday worriedness	Ref.=No		Ref.=No		Ref.=No		Ref.=No	
High	0.909	0.652-1.268	1.022	0.757-1.380	0.903	0.672-1.213	0.850	0.619-1.168
Application for a loan			Ref.=No					
Yes			0.847	0.575-1.249				
Gender							Ref.=No	
Male							0.854	0.638-1.142
Yesterday depression							Ref.=No	
High							1.076	0.728-1.591
Average work days per week			0.920***	0.872-0.972				
Increased mental disorders	Ref.=No							
Yes	0.904	0.649-1.259						

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	Model 1		Model 2		Model 3		Model 4	
	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI
Number of family members	Ref.=No							
>=4	0.872	0.646-1.178						
Subsidized scheme	Ref.=No				Ref.=No		Ref.=No	
Yes	0.848	0.635-1.132			0.871	0.649-1.169	0.842	0.633-1.119
Inaccessible care			Ref.=No				Ref.=No	
Yes			1.652	0.700-3.901			1.553	0.661-3.648
N	749		748		749		749	

Table 1. Factors associated with dissatisfaction with occupation (N=750)

*Note: *p<0.10, **p<0.05 and ***p<0.01.*

In Table 2, economic support from the government (aOR=0.578, 95% CI: 0.379-0.881) in model 1, economic support from the government (aOR=0.596, 95% CI: 0.348-1.019) and governmental opening of business places and dates (aOR=0.763, 95% CI: 0.554-1.052) was significantly associated with dissatisfaction with life, respectively. Simultaneously, rented house, yesterday depression, average work days per week in model 1, number of children, distrust in national police, yesterday worriedness, and unemployed 90+ days during the quarantine in model 2, average work days per week in model 3, and rented house and gender in model 4 were significantly associated with dissatisfaction with life, respectively.

	Model 1		Model 2		Model 3		Model 4	
	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI
Economic support from government	Ref.=No		Ref.=No		Ref.=No			
Yes	0.578**	0.379-0.881	0.596*	0.348-1.019	0.979	0.717-1.338		
Subsidy beneficiary			Ref.=No					
Yes			0.828	0.499-1.374				
Governmental opening of business places and dates			Ref.=No					
Yes			0.763*	0.554-1.052				
Access to governmental programs							Ref.=No	
Yes							0.804	0.597-1.082
Number of children			Ref.=No					
Yes			0.548***	0.370-0.811				
Distrust in national police			Ref.=No					
Yes			1.009	0.696-1.464				
Rented house	Ref.=No						Ref.=No	
Yes	0.559***	0.406-0.768					0.426***	0.321-0.566
Yesterday worriedness			Ref.=No					
High			2.056***	1.477-2.863				
Application for a loan					Ref.=No			
Yes					0.783	0.527-1.163		
Gender					Ref.=No		Ref.=No	
Male					0.930	0.685-1.263	0.629***	0.484-0.818
Yesterday depression	Ref.=No				Ref.=No			
High	1.992***	1.392-2.849						
Average work days per week	0.876***	0.839-0.914			0.865***	0.827-0.906		
Family member lost	Ref.=No							

	Model 1		Model 2		Model 3		Model 4	
	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI
Yes	1.178	0.677-2.052						
Unemployment 90+ days			Ref.=No					
Yes			0.412***	0.290-0.586				
Distrust in municipal council			Ref.=No					
Yes			1.294	0.862-1.944				
Police persecution							Ref.=No	
yes							0.846	0.631-1.136
N	749		750		749		750	

Table 2. Factors associated with dissatisfaction with life (N=750)

*Note: *p<0.10, **p<0.05 and ***p<0.01.*

In Table 3, governmental interventions were not significantly associated with increased mental disorders, respectively. But, number of children in model 1, unemployed 90+ days during the quarantine in model 2, yesterday worriedness in model 3, and rented house, average work hours per day, multiracial ethnicity, and gender in model 4 were significantly associated with increased mental disorders, respectively.

	Model 1		Model 2		Model 3		Model 4	
	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI
Economic support from government	Ref.=No							
Yes	0.779	0.532-1.140						
Subsidy beneficiary			Ref.=No					
Yes			1.275	0.895-1.815				
Governmental opening of business places and dates					Ref.=No			
Yes					1.043	0.755-1.441		
Access to governmental programs							Ref.=No	
Yes							0.992	0.719-1.370
Income before pandemic	Ref.=No							
Yes	1.239	0.910-1.687						
Number of children	Ref.=No							
Yes	1.892***	1.219-2.939						
Socioeconomic strata	Ref.=SES3-5				Ref.=SES3-5		Ref.=SES3-5	
SES2	1.366	0.918-2.032			0.784	0.505-1.218	1.263	0.846-1.887
SES1	1.256	0.836-1.888			0.838	0.546-1.287	1.288	0.870-1.906
Dissatisfaction with occupation	Ref.=No		Ref.=No				Ref.=No	
Yes	1.072	0.760-1.511	1.143	0.823-1.586			1.151	0.824-1.608
Multiracial ethnicity			Ref.=No					
Yes			1.081	0.808-1.446				
Distrust in national police	Ref.=No							
Yes	0.746	0.508-1.095						
Distrust in civil service	Ref.=No							
Yes	1.141	0.788-1.651						

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	Model 1		Model 2		Model 3		Model 4	
	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI
Unemployment 90+ days			Ref.=No					
Yes			1.771***	1.356-2.313				
Pandemic disease	Ref.=No							
Yes	1.410	0.898-2.215						
Head of household							Ref.=No	
Yes							1.242	0.889-1.733
Daily sales on average	1.000	1.000-1.000	1.000	1.000-1.000	1.000	1.000-1.000	1.000	1.000-1.000
Daily earnings on average	1.000	1.000-1.000	1.000	1.000-1.000			1.000	1.000-1.000
Dissatisfaction with life	Ref.=No							
yes	1.270	0.873-1.846						
Age categories	Ref.=young							
Middle	0.778	0.516-1.172						
Older	0.930	0.582-1.484						
Family member lost			Ref.=No					
Yes			1.219	0.704-2.112				
Rented house			Ref.=No		Ref.=No		Ref.=No	
Yes			1.160	0.856-1.572	1.134	0.816-1.574	1.153	0.849-1.567
Average work hours per day					0.989	0.940-1.040	1.050**	1.002-1.101
Multiracial ethnicity					Ref.=No		Ref.=No	
Yes					0.880	0.634-1.224	1.013	0.746-1.376
Yesterday worriedness					Ref.=No			
High					5.514***	3.944-7.707		
Head of household					Ref.=No			
Yes					1.077	0.752-1.541		
Application for a loan					Ref.=No			
Yes					0.969	0.637-1.473		

	Model 1		Model 2		Model 3		Model 4	
	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI
Gender							Ref.=No	
Male							0.662**	0.481-0.910
N	746		749		747		746	

Table 3. Factors associated with increased mental disorders (N=750)

*Note: *p<0.10, **p<0.05 and ***p<0.01.*

In Table 4, economic support from the government (aOR=0.674, 95% CI: 0.468-0.972) in Model 1, subsidy beneficiary (aOR=0.684, 95% CI: 0.475-0.986) in Model 3 were significantly associated with yesterday unhappiness, respectively. Number of family members, daily earnings on average, and yesterday depression in Model 1, distrust in municipal council, dissatisfaction with occupation, average work days per week, unemployed 90+ days during the quarantine, and COVID-19 disease in Model 2, socioeconomic strata in Model 3, number of family members, dissatisfaction with occupation, inaccessible care, COVID-19 disease, and head of household in Model 4 were significantly associated with yesterday unhappiness, respectively.

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	Model 1		Model 2		Model 3		Model 4	
	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI
Economic support from government	Ref.=No							
Yes	0.674**	0.468-0.972						
Subsidy beneficiary			Ref.=No		Ref.=No			
Yes			0.941	0.655-1.350	0.684**	0.475-0.986		
Governmental opening of business places and dates					Ref.=No			
Yes					0.793	0.600-1.047		
Access to governmental programs							Ref.=No	
Yes							0.881	0.639-1.215
Distrust in municipal council			Ref.=No					
Yes			1.828***	1.190-2.809				
Number of family members	Ref.=No		Ref.=No				Ref.=No	
>=4	0.746**	0.560-0.994	0.819	0.609-1.101			0.646***	0.484-0.862
Governmental opening of business places and dates								
yes							0.987	0.741-1.314
Socioeconomic strata					Ref.=SES3-5			
SES2					0.640**	0.446-0.920		
SES1					1.590**	1.109-2.281		
Dissatisfaction with occupation			Ref.=No				Ref.=No	
Yes			1.748***	1.263-2.419			1.525***	1.111-2.094
Multiracial ethnicity			Ref.=No					
Yes			1.175	0.865-1.596				
Distrust in national police	Ref.=No				Ref.=No		Ref.=No	
Yes	1.241	0.875-1.759			0.901	0.672-1.207	1.111	0.831-1.486

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	Model 1		Model 2		Model 3		Model 4	
	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI
Distrust in civil service	Ref.=No		Ref.=No					
Yes	0.870	0.622-1.217	1.129	0.759-1.677				
Inaccessible care	Ref.=No		Ref.=No				Ref.=No	
Yes	1.750	0.740-4.139	2.133	0.864-5.265			2.325*	0.955-5.661
Daily earnings on average	1.000***	1.000-1.000						
Yesterday depression	Ref.=No							
High	1.865***	1.325-2.626						
Average work days per week			0.860***	0.804-0.920				
Unemployment 90+ days			Ref.=No					
Yes			0.710**	0.504-0.998				
Pandemic disease			Ref.=No				Ref.=No	
Yes			0.487***	0.304-0.779			0.468***	0.296-0.741
Subsidized scheme					Ref.=No		Ref.=No	
Yes					0.857	0.637-1.153	1.097	0.818-1.471
Head of household							Ref.=No	
yes							0.654***	0.490-0.871
N	749		749		750		750	

Table 4. Factors associated with yesterday unhappiness (N=750)

*Note: *p<0.10, **p<0.05 and ***p<0.01.*

In Table 5, governmental interventions were not significantly associated with yesterday worriedness. But, number of children in models 1 and 2, unemployed 90+ days during the quarantine and working years in model 2, working years, socioeconomic strata, and bad income in model 3, socioeconomic strata in model 4 were significantly associated with yesterday worriedness, respectively.

	Model 1		Model 2		Model 3		Model 4	
	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI
Economic support from government	Ref.=No							
Yes	1.052	0.726-1.523						
Subsidy beneficiary			Ref.=No					
Yes			1.097	0.761-1.580	1.056	0.727-1.535		
Governmental opening of business places and dates					Ref.=No		Ref.=No	
Yes					0.907	0.674-1.222	0.878	0.651-1.185
Access to governmental programs							Ref.=No	
Yes							1.253	0.912-1.721
Number of children	Ref.=No		Ref.=No					
Yes	1.539**	1.045-2.267	1.464**	1.001-2.140				
Gender	Ref.=No				Ref.=No		Ref.=No	
Male	0.886	0.658-1.193			0.835	0.616-1.131	0.865	0.642-1.167
Dissatisfaction with occupation	Ref.=No						Ref.=No	
Yes	1.096	0.797-1.506					1.065	0.773-1.467
Distrust in municipal council	Ref.=No		Ref.=No		Ref.=No		Ref.=No	
Yes	1.012	0.723-1.417	0.968	0.701-1.338	0.952	0.680-1.334	1.004	0.718-1.404
Daily sales on average	1.000	1.000-1.000	1.000	1.000-1.000			1.000	1.000-1.000
Police persecution	Ref.=No							
Yes	1.013	0.745-1.377						
Number of family members	Ref.<45							
>=4	0.964	0.716-1.299						
Daily earnings on average	1.000	1.000-1.000						
Governmental opening of business places and dates	Ref.=No		Ref.=No					

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	Model 1		Model 2		Model 3		Model 4	
	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI
Yes	0.899	0.662-1.222	0.924	0.689-1.238				
Average work hours per day	1.021	0.975-1.070			0.986	0.941-1.033	0.995	0.950-1.043
Unemployment 90+ days			Ref.=No					
Yes			1.319*	0.954-1.823				
Working years			0.998	0.986-1.010	1.001	0.989-1.014		
Socioeconomic strata					Ref.=SES3-5			
SES2					1.928***	1.296-2.868	1.925***	1.297-2.859
SES1					1.705***	1.150-2.528	1.709***	1.159-2.520
Bad income					Ref.=No			
Yes					1.356*	0.996-1.845		
Rented house					Ref.=No			
Yes					1.015	0.755-1.364		
Dissatisfaction with occupation					Ref.=No			
Yes					1.020	0.731-1.425		
Debts or loans before pandemic					Ref.=No			
Yes					0.991	0.719-1.368		
Multiracial ethnicity							Ref.=No	
Yes							1.121	0.830-1.514
N	746		750		747		747	

Table 5. Factors associated with yesterday worriedness (N=750)

*Note: *p<0.10, **p<0.05 and ***p<0.01.*

In Table 6, economic support from the government (aOR=0.683, 95% CI: 0.443, 1.054), subsidy beneficiary (aOR=0.597, 95% CI: 0.412, 0.867), governmental opening of business places and dates (aOR=0.429, 95% CI: 0.311, 0.593), access to governmental programs (aOR=0.442, 95% CI: 0.312, 0.627) was significantly associated with yesterday depression, respectively. Age categories, daily sales on average, multiracial ethnicity, and rented house possibly moderated the first association. Distrust in national police possibly moderated the other three associations. Working years possibly moderated the

third association. Moreover, subsidized scheme possibly moderated the fourth association.

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	Model 1		Model 2		Model 3		Model 4	
	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI
Economic support from government	Ref.=No							
Yes	0.683*	0.443,1.054						
Subsidy beneficiary			Ref.=No					
Yes			0.597***	0.412, 0.867				
Governmental opening of business places and dates					Ref.=No			
Yes					0.429***	0.311, 0.593		
Access to governmental programs							Ref.=No	
Yes							0.442***	0.312, 0.627
Distrust in national police			Ref.=No		Ref.=No		Ref.=No	
Yes			0.345***	0.281, 0.424	0.550***	0.409,0.740	0.470***	0.362, 0.611
Age categories	Ref.=Young							
Middle	0.642**	0.451,0.914						
Older	0.573***	0.383,0.857						
Daily sales on average	1.000***	1.000,1.000						
Multiracial ethnicity	Ref.=No							
Yes	0.646**	0.461,0.907						
Head of household	Ref.=No							
Yes	1.312	0.931, 1.848						
Rented house	Ref.=No							
Yes	0.636***	0.460,0.880						
Working years					0.989*	0.978,1.001		
Subsidized scheme					Ref.=No		Ref.=No	
Yes					0.859	0.627,1.176	0.753*	0.565, 1.002
Insufficient resources for livelihood					Ref.=No			
Yes					1.142	0.813,1.606		
N	747		750		750		750	

Table 6. Factors associated with yesterday depression (N=750)

*Note: *p<0.10, **p<0.05 and ***p<0.01.*

Moderating effect

The moderating effect of governmental interventions was examined by a series of multiple hierarchical regressions in Supplementary Tables 9 to 14. According to the statistical results, several significant interactions were confirmed. Thus, simple slope diagrams of yesterday depression moderating the associations between economic support from the government and dissatisfaction with life, average work hours per day moderating the associations between access to governmental programs and increased mental disorders, socioeconomic strata moderating the associations between governmental opening of business places and dates and yesterday unhappiness, head of household moderating the associations between access to governmental programs and yesterday unhappiness, and socioeconomic strata moderating the associations between access to governmental programs and yesterday worriedness was drawn in Figures 7 to 11.

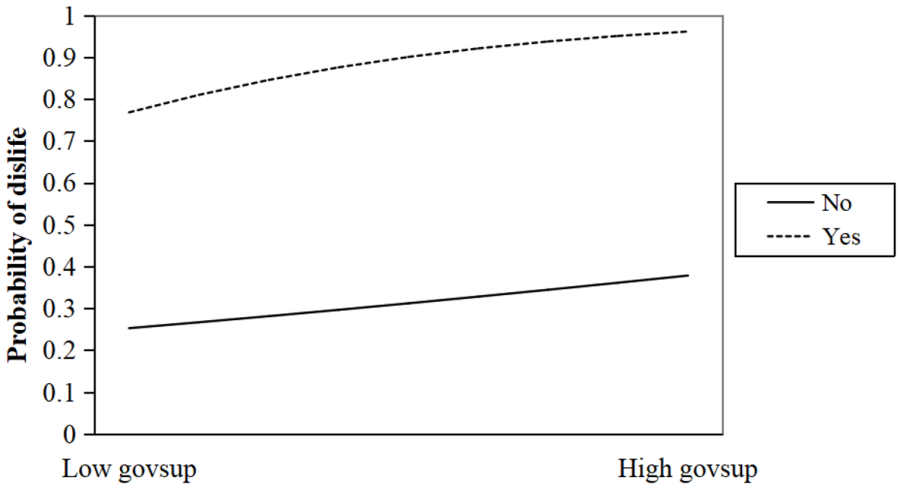

Figure 7. Yesterday depression moderating the associations between economic support from the government and dissatisfaction with life

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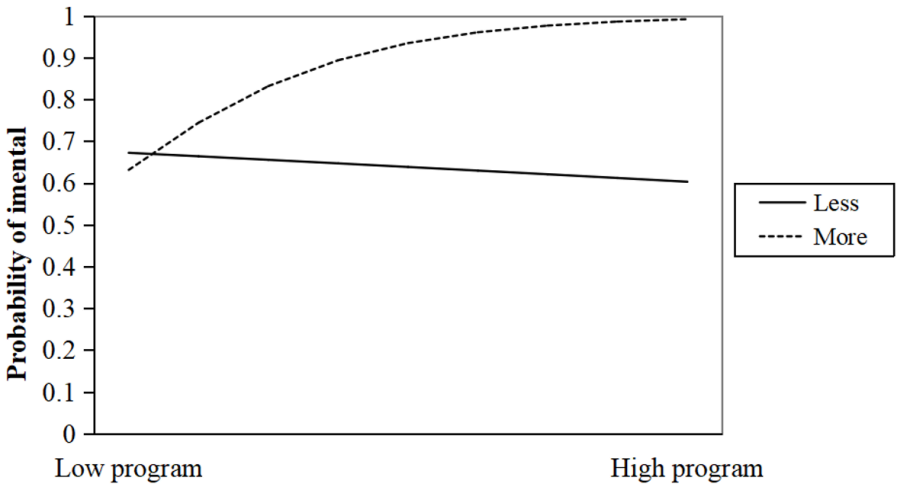

Figure 8. Average work hours per day moderating the associations between access to governmental programs and increased mental disorders

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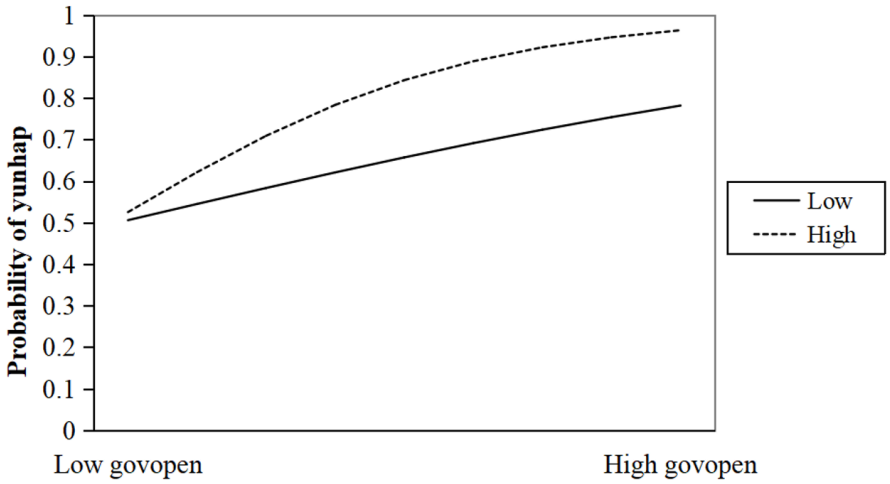

Figure 9. Socioeconomic strata moderating the associations between governmental opening of business places and dates and yesterday unhappiness

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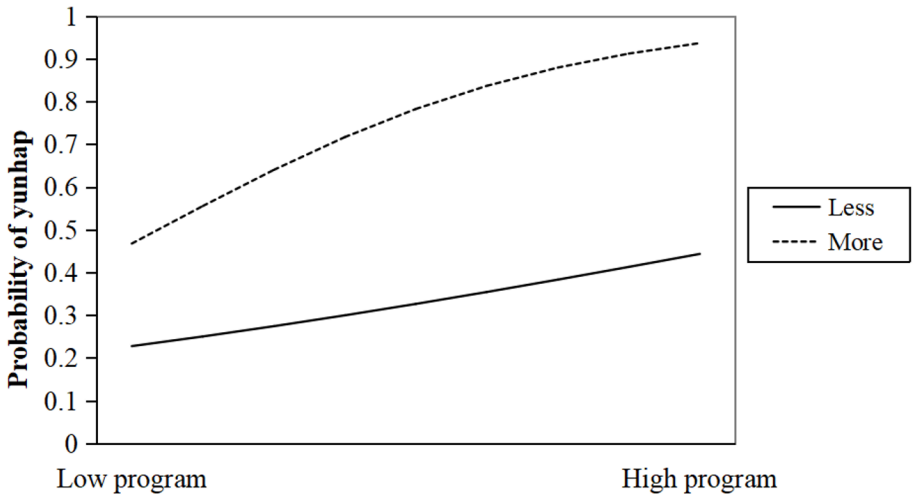

Figure 10. Head of household moderating the associations between access to governmental programs and yesterday unhappiness

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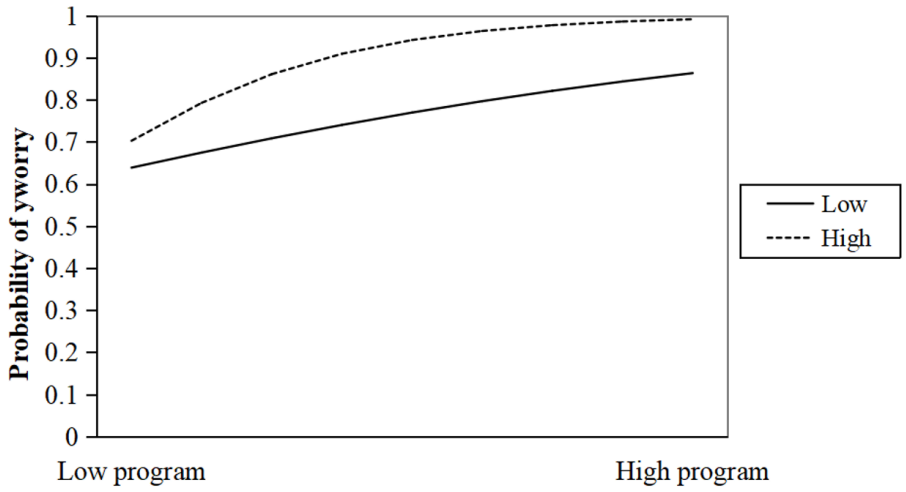

Figure 11. Socioeconomic strata moderating the associations between access to governmental programs andyesterday worriedness.

Discussions

Summary of the main findings

Most of the sample in this study experienced war trauma, life difficulties, business difficulties, and mental disorders. They distrusted in governmental agencies, police, council, and service. With heavy family burden, most of respondents were heads of household. There were significant negative subjective well-being in the case of socioeconomic factors, business factors, political factors, and pandemic factors.

Key explanations of the main findings

Obviously, trust was not a protective factor for negative subjective and moderator for the associations of interest in this study. This was consistent with some studies in other countries. In western countries, such as Japan[50], Austria[51], G7 countries[52], Netherlands[53], trust in government varied across socioeconomic factors. This was not consistent with an investigation which found that trust in government during the ongoing COVID-19 pandemic had a significant direct impact on individuals' general well-being[54].

So many measures were employed to mitigate the detrimental effects of the COVID-19 pandemic on informal business. A systematic review reported governments that enacted stringent measures to contain the spread of COVID-19 benefited the mental health of their population[55]. Seemingly, supported employment programs can improve the reform of the mental health care system in Colombia[56].

Relevance to other studies

Regarding social outcomes, the results of the current study was in line with another study which indicated that the COVID-19 pandemic had the overall potential to increase social and health inequalities[57]. Similarly, a study reported the deadly impact of COVID-19 pandemic situation on the women informal workers with a lot of serious threats like insecurity, low resources and low standard of living[58]. As for vulnerable groups, the findings in this study were consistent with a Nigerian study that many economically vulnerable informal workers have slipped below the poverty line and struggled for supply livelihood needs due to low earn daily income[59].

The finding of the study reveals a positive economic and social impact of government on the informal sector due to the COVID-19 outbreak. This was in line with some other studies. For example, a study in Texas find that the general public were more likely to view government as extremely important to respond to the COVID-19 pandemic[60]. But even worse, the dominance of poverty related factors lead to poor

mental health in Cali, Colombia[61]. Most street traders of Cali, Colombia operate illegally with official containment[62]. COVID-19 pandemic had weakened originally weak health systems in Bogotá, Colombia[63].

Several studies indicated persecution had been a main predictor of poor mental health[64][65][66][67][68]. Also, a study indicated working long hours were associated with mental disorders in business and finance occupations[69]. Furthermore, the moderating role of government suppressing the negative association between SES and psychological health[70] was not confirmed in this study.

Implications

This study contributed to the body of knowledge regarding government interventions during the COVID-19 pandemic to mitigate mental disorders in informal sectors. Several government programs play a vital role in helping the informal workers to survive the pandemic and stabilize their livelihood in Indonesia[71]. Several studies underscore the importance of mental interventions in post-conflict Colombia[72][73][74][75]. Obviously, COVID-19 led to business lost in sales. Multiple studies indicated support from governments was critical to small businesses to survive the COVID-19 pandemic[76][77][78]. Likewise, income and debt relief strategies were suggested to support businesses in distress[79]. To support street vendors, Cali government should use different mechanisms by economic support from the government, access to governmental programs, and governmental opening of business places and dates to revitalize informal sector.

Limitations

Besides cross-sectional nature, some socioeconomic factors left out in the survey should be paid attention. For example, association between urban violence rate and poor health outcomes was known in Cali, Colombia[80]. Likewise, persons with more educational attainment were confirmed to more likely to trust in government[81][82][83].

Conclusions

The results suggest that the street vendors were the marginalized section of society and struggling with the poverty, civil, and COVID-19 situations. Not all the governmental interventions for the subjective well-being of informal workers during the COVID-19 pandemic were effective and beneficial. These findings help screened out invalid and useless policy tools for well-being of informal workers and present the actual psychological mechanisms that socioeconomic factors moderates the associations of economic support from the government, access to governmental programs, and governmental opening of business places and dates with negative subjective well-beings. Further, the empirical outcomes from this study point out the direction of improving well-being, maintaining peace, and restoring business.

Abbreviations

- COVID-19 Coronavirus disease-19
- aOR Adjusted odds ratio
- 95% CI 95% confidence interval

Statements and Declarations

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Availability of data and materials

Access to the survey data is open and publicly available in the following link: https://data.mendeley.com/datasets/w5×3dp8t4z/1

Ethics approval and consent to participate

The data adopted was from a publicly available survey dataset whose ethical approval was obtained from the institutional review board at University of Glasgow, UK. All methods were carried out in accordance with relevant guidelines and regulations. Written informed consent was obtained from all participants before they agreed to participate in the study. Participants were informed that they could leave the study at any time without penalty, and all personal information was kept confidential. Thus, it was not necessary to obtain ethical approval from the institutional review board at the author's institution.

Conflicts of interest

The authors declare that they have no competing interests regarding the publication of this paper.

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