

# Determinants of Mental Health Deterioration among Older People during the COVID-19 Pandemic: A Longitudinal Study in Indonesia

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## Abstract

Mental health deterioration among older people in the COVID-19 pandemic has become a significant concern because they are vulnerable even in pre-pandemic situations. This paper aims to examine determinants of mental health deterioration among older people during the COVID-19 pandemic in three provinces of Indonesia. A total sample of 2,407 respondents aged 60 years and older who had three repeated 5-item Geriatric Depression Scale (GDS) measures in pre-pandemic and pandemic was selected. Covariates describing older people's condition in two rounds during the pandemic such as change of income, social assistance from the government, morbidity score, health facility visits, interaction with family or close friends, support from family or relatives, and socio-demographic characteristics were analyzed using the logistic regression model.

Results revealed some differences in determinants of mental health deterioration among older people with and without pre-existing health problems. Social interaction aspects benefited older people without pre-existing health problems to reduce the possibility of mental health deterioration. Meanwhile, those with pre-existing health problems benefited from the social support by *Posyandu* (integrated health post) cadres, health workers, or social workers. Relaxation to social activity restriction in November 2020 than those in July 2020 significantly reduced the possibility of depressive symptoms worsening. These findings suggest a different approach in providing social support for older people based on their health profile. Adherence to health protocol and other risk reduction mechanisms should be prepared well due to the high risk of COVID-19 infection during the relaxation of social restriction.

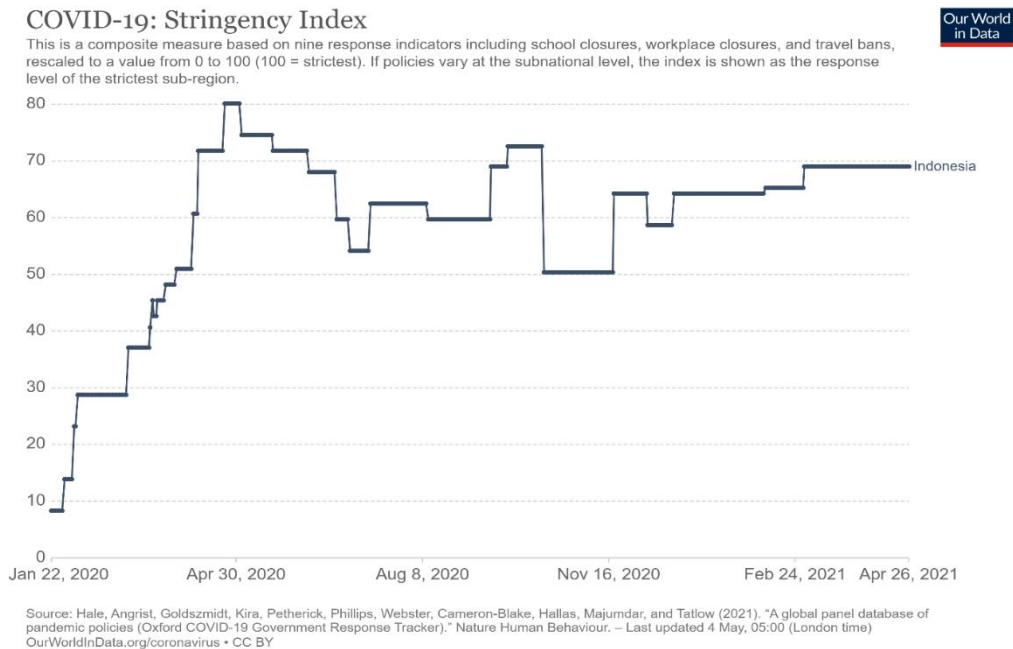
**Keywords:** older people, mental health, COVID-19, restriction policy, social support

## **INTRODUCTION**

Several studies found that the COVID-19 pandemic disproportionately impacts older people's health, economic and social aspects (Morrow-Howell, Galucia, and Swinford 2020; Study Team 2021a). Because of high morbidity and mortality cases in their age, older people have been strongly suggested self-isolating at home and avoiding unnecessary contact with other people. Change of well-being, social isolation, anxieties, and loneliness as consequences of social activity restriction policy during the pandemic circumstances made them vulnerable groups to mental health problems (Carvalho et al. 2021; Kobayashi et al. 2021). Considering this concern, collecting high-quality data of COVID-9 effects on mental health and research to address the consequences, particularly for vulnerable groups, is an urgent priority to draw up a mitigation plan (Holmes et al. 2020).

Indonesia is one of the ASEAN Member States most affected by COVID-19 in terms of the numbers of confirmed cases and fatalities (Study Team 2021a). Since the first case of COVID-19 was identified on 2 March 2020, Indonesia has reported the escalation in daily confirmed cases. The government has made various efforts to control the COVID-19 pandemic, including imposing restrictions on social activities. Along with the length of the pandemic period, the government changes and adjusts policies to the new normal conditions to restore the economy and social activities.

The Stringency Index depicts the change of activity restriction during 2020 in Figure 1. The higher the Stringency Index means the higher intensity of the restriction policy implemented (Hale et al., 2021). The peak of social restrictions in Indonesia occurred from 24 April 2020 to 1 May 2020 or after Eid al-Fitr with a Stringency Index of 80.09. Afterward, social restriction continued to loosen until the end of 2020, as indicated by the downward trend in the Stringency Index, including in two rounds of phone surveys conducted in July and November 2020.



**Figure 1. Activity Restriction in Indonesia**

COVID-19 effect on older people's mental health in Indonesia had been confirmed in the previous study. Some older people experienced worsening depression symptoms in the early pandemic than those in the pre-pandemic (Study Team 2021b). However, other studies revealed that people's routines and positive coping strategies implemented during the extended pandemic could also help maintain their resilience toward mental health deterioration (Skapinakis et al. 2020; Carvalho et al. 2021). The level of mental health, including depression symptoms, might not continue to worsen, along with the relaxation of restriction and individual adaptation to circumstances (Fancourt, Steptoe, and Bu 2021). Therefore, it will be helpful to assess the effect of policy adjustment overtime on depression levels (Yee et al., 2021).

As Indonesia moves into phases of intermittent restriction, older people remain to be prioritized for stay-at-home advice. Identifying the groups most at risk of mental health deterioration and its determinants might help authorities and agencies target those needing additional support during the ongoing pandemic and prepare for future pandemics (Fancourt, Steptoe, and Bu 2021). This paper aims to examine determinants of mental health deterioration among older people during the COVID-19 pandemic in Indonesia.

Some studies lack information about mental health from pre-pandemic, so it is difficult to precisely measure the change in mental health conditions (Losada-Baltar et al. 2021; Pearman et al. 2021; Yee et al. 2021; González-Sanguino et al. 2020). With the support of pre-pandemic data, this paper focused on the worsening of depression symptoms experienced by older people from pre-pandemic to two different times during the pandemic as mental health deterioration indicator and factors associated.

Mental health problems are common in older adults, particularly depressive symptoms (Carvalho et al., 2021). Depression is a mental health problem that primarily disrupts mood and is associated with physical, emotional, cognitive symptoms, and behavioral change (Yee et al., 2021).

Besides age, many factors have contributed to mental health worsening during the pandemic. Socio-demographic factors such as sex, education, living location, and economic well-being are among the determinants of mental health conditions during the pandemic (Bu, Steptoe, and Fancourt, 2020). Some studies found that being female, living in an urban area, and has a lower income is associated with a high risk of depressive symptoms during the pandemic (Yee et al., 2021)

People with specific health profiles, either diseases or disabilities, are more likely to report worse health and social well-being outcomes during the pandemic (Di Gessa and Price, 2021; Pearman et al., 2021). Aging-related disabilities such as Activities of Daily Living (ADL) also increase the risk of mental health problems during the pandemic (Steptoe and Di Gessa, 2021). Likewise, people with pre-existing health conditions were more likely to have higher depressive symptoms during the pandemic (Fancourt, Steptoe, and Bu, 2021).

Older people with underlying health conditions, even pre-pandemic, faced challenges accessing healthcare services and social contact and experienced more emotional distress and a higher risk of loneliness. During the pandemic, these issues might have been exacerbated by the guidance to stay at home and minimize social contacts as well as by reduced care provision (Di Gessa and Price, 2021),

## **METHODS**

### **Data**

Longitudinal data used in this paper came from SILANI (*Sistem Informasi Lanjut Usia Indonesia* – Information System of Indonesia Older People) study. This project was conducted by collaboration between the Ministry of National Development Planning/National Development Planning Agency (Kementerian Perencanaan Pembangunan Nasional/Badan Perencanaan Pembangunan Nasional, Bappenas), Economic Research Institute for ASEAN and East Asia (ERIA), and SurveyMETER. Samples covered seven districts in Jakarta, Bali, and the Special Region of Yogyakarta provinces.

SILANI consists of a census of older people covering seven villages in 2019 (pre-pandemic), followed by two rounds of Older People and COVID-19 phone surveys in July and November 2020 (during the pandemic). It creates three rounds of panel data for some variables; however, phone surveys have fewer and additional questions/variables compared to the pre-pandemic version, considering time limitations in phone calls and COVID-related context. Also, some indicators have been adjusted with the pandemic situation.

For analysis purposes, we selected 2,407 non-proxy respondents (respondents who answered all questions by themselves, without assistance) who had three repeated depression measures in the pre-pandemic survey conducted in July and November 2020. Some non-proxy respondents who did not answer clearly (do not know) were excluded. Eventually, we analyzed two data periods representing two rounds of telephone surveys during the pandemic considering the consistency of indicators.

## Measures

Mental health condition was determined using the 5-item Geriatric Depression Scale (GDS) to collect information regarding depression status quickly via a phone survey. The 5-item GDS version has been validated as effective as the 15-item GDS to screen depression (Hoyl et al. 1999; Rinaldi et al. 2003). As for the Indonesian version of GDS questions, we referred to the *Petunjuk Teknis Instrumen Pengkajian Paripurna Pasien Geriatric* (Technical Instructions for Plenary Assessment of Geriatric Patients) provided by the Ministry of Health (Kementerian Kesehatan RI 2017).

The five-item GDS encompasses the following factors which are related to depressive status: (i) helplessness, (ii) boredom, (iii) satisfaction, (iv) the reluctance to go out of the house, and (v) worthlessness. However, we excluded the variable (iv) stated above because this question might confuse and create ambiguity in answers during the pandemic when older people are encouraged to stay at home (Study Team 2021b).

We focused on four depressive symptoms for analysis. A dichotomous (yes/no) response was used for each item. To consider the change, we compared pandemic and pre-pandemic scores. Therefore, mental health deterioration means a higher score during the pandemic compared to those pre-pandemic. We analyzed each symptom's deterioration and total score of symptoms ranging between zero (no symptoms) and four (all four symptoms).

We included changes in income (decrease vs. same or increase) to capture economic well-being during the pandemic. Also, we considered the number of assistances received by the respondent during the pandemic into three categories: 0 assistances, 1-2 assistances, and 3-4 assistances.

Respondent's health profile was measured by comorbidity score diagnosed in each telephone survey and health problems diagnosed since pre-pandemic. This study defined comorbidity score as the number of respondents' chronic conditions that health professionals had diagnosed. We asked them about six chronic conditions: high blood pressure, heart disease, diabetes, lung disease, kidney disease, and stroke. Then we categorized it into 0 comorbidities, 1-2 comorbidities, and three comorbidities or more. As for pre-existing health problems (yes/no), we re-categorized them based on pre-pandemic data. Respondents with pre-existing health problems are those who at least had any problem with ADL, IADL, cognitive, depression, or another disability problem. Further, we used pre-existing health problems in sub-sample analysis to control respondents who need health support even since pre-pandemic.

Social interaction was captured by an in-person meeting with family, friends, or relatives (yes/no), meeting through social media; and social activity outside the house (never, sometimes, and often). In addition, we derived social support from *Posyandu* (community-based health support) cadres, health workers, and social cadres (yes/no) and from family and relatives, categorized into no support, one support, two supports, and three supports or more.

We controlled the analysis for some socio-demographic characteristics—male and female represented sex. Age was modeled as a categorical variable, distinguishing between 60-69 years and 70 years or over. We also considered the living location of respondents, whether they were living in the urban or rural area. In addition, three provinces that represented our study area were included in our analysis.

The change of condition over time was represented by restriction level in two rounds of telephone surveys. The November 2020 telephone survey was conducted when activity restriction was more relaxed, indicated by the average stringency index comprised 56.02, than those in July 2020 when

the average stringency index was 59.81. We considered relaxation as a control variable based on this condition to examine its effect on mental health deterioration, so we created a dummy variable with "0" for July 2020 observation and "1" for November 2020 observation.

### **Analysis Procedure**

We reported descriptive statistics of all variables. In addition, we used a logistic regression model to examine determinants of mental health deterioration during the pandemic. We divided the analysis into two sub-sample, i.e., respondents with pre-existing health problems and those without health problems.

### **RESULT**

Descriptive analysis for two rounds of phone surveys is shown in table 1. There are changes of sample distribution in each category representing the change of condition between two survey rounds. Overall, respondents with a higher total score of four depression symptoms in November 2020 (16.74%) were less than those in July 2020 (23.97%). It means that older people who experienced mental health deterioration during the pandemic in November 2020 were fewer than those in July 2020. However, one in four symptoms showed an increasing trend from July 2020 to November 2020, namely worthlessness. The percentage of respondents who feel worthless slightly increased from 4.03% in July 2020 to 4.15% in November 2020. Several categories of respondents contributed to this increasing trend.



In socio-demographic aspects, male respondents who felt worthlessness increased from 3.20% in July 2020 to 4.67% in November 2020. The percentage of respondents aged 69-89 years old and those living in urban areas, living in Bali, and DIY also had increasing worthlessness.

Respondents whose income decreased in November 2020 (39.34% of total respondents) were reduced than those in July 2020 (55.89%). Likewise, respondents who receive three types of assistance in November 2020 were less than those in July 2020. Despite fewer respondents experienced income decreased, those who felt worthless in November 2020 were higher. Respondents whose income declined and felt worthless increased from 4.76% to 5.39%, while those whose income did not decrease and felt worthless rose from 3.11% to 3.36%.

Fewer respondents postponed visiting health facilities in November 2020 (15.08%) than in July 2020 (17.49%). As more respondents visited health facilities, more were diagnosed with comorbidity in November 2020 than those in July 2020. Respondents with three morbidities or more who felt helpless and dissatisfied in November 2020 (helpless: 12.32%; dissatisfied: 8.27%) were slightly higher than those in July 2020 (helpless: 12.20%; dissatisfied: 8.45%).

More respondents had more social connections, either through in-person meetings, telecommunication media, or social activity, in November 2020 than July 2020. We found that the percentage of respondents who did not use telecommunication media to contact their family or relatives and felt worthless increased from 4.30% in July 2020 to 5.62% in November 2020. A similar condition occurred in respondents who never engage in any social activities. Interestingly, respondents who often engage in social activities also had a higher percentage of worthlessness in November 2020 than in July 2020.

The number of older people receiving social support from the community, such as *Posyandu* cadres, health workers, or social cadres in November 2020, increased from 8.56% to 18.78% out of total respondents. Conversely, beneficiaries of social support from family or relatives decreased from 93.56% to 84.25% out of total respondents. Among them, respondents who did not receive support from *Posyandu* cadres, health workers, or social cadres and those who received three or more support from family or relatives were more likely to feel worthless

**Table 1 Descriptive Statistics**

Covariates	Percentage of Mental Health deterioration											
	July 2020 (N=2.407)						November 2020 (N=2407)					
	Helpless	Bored	Dissatisfied	Worries	Total Score	N	Helpless	Bored	Dissatisfied	Worries	Total Score	N
<b>Sex</b>												
Male	6.83	15.04	14.61	3.20	23.94	1,157	5.62	13.92	7.00	4.67	15.90	1,157
Female	10.00	16.48	10.80	4.80	24.00	1,250	6.40	10.46	6.40	3.68	17.52	1,250
<b>Age</b>												
60 to 69 years	8.21	16.70	13.06	3.93	24.74	1,754	5.53	12.60	6.56	4.45	16.88	1,754
70 and over	9.19	13.32	11.49	4.29	21.90	653	7.35	11.33	7.04	3.37	16.39	653
<b>Residence</b>												
Rural	10.90	18.59	16.67	5.77	23.08	156	5.77	14.74	8.97	3.21	15.38	156
Urban	8.31	15.59	12.35	3.91	24.03	2,251	6.04	12.08	6.53	4.22	16.84	2,251
<b>Province</b>												
Bali	11.22	20.05	18.62	4.06	31.26	419	8.35	15.99	11.22	4.53	22.20	419
DIY	5.33	11.11	8.59	1.78	17.63	675	3.70	8.30	5.93	1.93	12.59	675
DKI Jakarta	9.22	16.83	12.80	5.18	24.90	1,313	6.47	13.10	5.64	5.18	17.14	1,313
<b>Income</b>												
Same/Increase	6.03	13.56	9.23	3.11	19.87	1,062	5.27	11.85	5.00	3.36	15.89	1,460
Decrease	10.41	17.55	15.32	4.76	27.21	1,345	7.18	12.88	9.29	5.39	18.06	947
<b>Number of assistance</b>												
0 type	6.98	14.72	10.57	3.21	21.51	530	4.11	11.89	6.75	2.79	15.27	681
1-2 types	9.01	16.12	14.04	4.68	26.60	1,154	6.79	12.90	7.65	4.82	18.06	1,163
3-4 types	8.71	16.04	11.89	3.60	21.58	723	6.75	11.37	4.62	4.44	15.81	563
<b>Postpone visiting health facilities</b>												
Yes	12.83	20.67	10.21	7.60	28.03	421	9.92	19.28	6.89	6.34	24.24	363
No	7.55	14.75	13.14	3.27	23.11	1,986	5.33	11.01	6.65	3.77	15.41	2,044
<b>Morbidity score</b>												
0 morbidity	6.93	14.91	13.22	3.11	21.97	1,543	4.59	11.05	6.18	3.89	14.52	1,439
1-2 morbidities	10.82	15.41	12.95	4.59	26.56	610	6.43	11.99	7.02	3.65	18.13	684
More than 3 morbidities	12.20	22.05	8.27	8.27	29.92	254	12.32	19.01	8.45	6.69	24.65	284
<b>Pre-existing Health Problems</b>												
Yes	8.65	15.28	12.05	5.15	22.62	1,145	6.29	12.58	7.07	5.24	15.98	1,145
No	8.32	16.24	13.15	3.01	25.20	1,262	5.78	11.97	6.34	3.17	17.43	1,262
<b>In-Person Meeting with family and relative</b>												
Yes	8.83	15.68	12.51	4.17	24.22	2,015	6.13	12.17	6.49	4.04	16.39	2,202
No	6.63	16.33	13.27	3.32	22.70	392	4.88	13.17	8.78	5.37	20.49	205
<b>Meeting with family or relative through telecommunication media</b>												

Covariates	Percentage of Mental Health deterioration											
	July 2020 (N=2.407)						November 2020 (N=2407)					
	Helpless	Bored	Dissatisfied	Worthless	Total Score	N	Helpless	Bored	Dissatisfied	Worthless	Total Score	N
Never	10.10	14.80	15.70	4.30	25.30	1,000	6.02	12.23	7.59	5.62	17.26	1,014
Sometimes	8.17	17.63	11.01	3.67	24.26	845	7.15	11.57	6.76	3.38	16.51	769
Always/Often	6.05	14.77	9.61	4.09	21.17	562	4.65	13.14	5.13	2.72	16.19	624
<b>Social activity outside the house</b>												
Never	8.61	17.42	13.11	4.37	25.02	1,487	6.91	15.29	8.47	4.70	20.90	1,086
Sometimes	9.42	16.91	11.35	4.59	25.36	414	6.99	11.79	5.68	4.59	15.07	458
Often	7.31	10.08	12.25	2.57	19.76	506	4.40	8.69	4.98	3.24	12.40	863
<b>Social support from <i>Posyandu</i> cadres, health workers, or social cadres</b>												
Yes	10.68	15.05	14.08	2.91	22.82	206	6.19	10.40	4.20	2.65	14.16	452
No	8.27	15.86	12.49	4.13	24.08	2,201	5.98	12.69	7.26	4.50	17.34	1,955
<b>Social support from family and relative</b>												
0 support	9.03	12.90	17.42	4.52	27.74	155	4.22	9.50	5.54	3.96	12.93	379
1 support	7.91	12.66	13.45	3.16	20.73	632	5.56	12.66	5.92	4.14	16.33	845
2 supports	7.44	17.29	10.68	4.44	22.93	833	6.08	11.82	7.39	3.94	17.41	609
3 supports or more	9.91	17.28	13.09	4.19	26.94	787	7.84	13.94	7.84	4.53	19.16	574
<b>Total</b>	<b>8.48</b>	<b>15.8</b>	<b>12.6</b>	<b>4.03</b>	<b>24</b>	<b>2,407</b>	<b>6.02</b>	<b>12.3</b>	<b>6.69</b>	<b>4.15</b>	<b>16.7</b>	<b>2,407</b>

Table 2 presents the result of the logistic regression analysis for determinants of depressive symptoms. It can be seen that being female without pre-existing health problems heightened the risk of feeling more helpless and bored during the pandemic. In contrast, females with pre-existing health problems were less likely to feel dissatisfied. Respondents aged 70 years and over without pre-existing health problems were less likely to feel bored than younger ones. At the same time, those living in urban areas were more likely to experience deterioration in a total of four symptoms. Older people in DIY were less likely to experience worsening depressive symptoms than those in Bali. However, we could not find a significant difference between respondents without pre-existing health problems in Bali, DIY, and DKI Jakarta in terms of each depressive symptom and those who felt worthless.

Declining income tends to make all respondents felt dissatisfied. The group with declining income was 1.62 times more likely to feel dissatisfied. The probability of feeling dissatisfied was even higher for those with income decline and pre-existing health problems up to 2.55 times. The last group was also more likely to feel worthless by 1.86 times and helpless by 1.93 times than the group who did not experience income decline.

Respondents who postponed visiting health facilities were more likely to experience mental health deterioration. Among respondents without pre-existing health problems, those who postponed health visits were more likely to feel helpless (1.81 times) and bored (2.40 times) than those who did not. Those with pre-existing health problems also experienced similar mental health decline when postponing health visits (odds ratio to feel helpless: 1.80, bored: 1.58, and worthless: 2.20).

Pre-existing health problems accompanied by comorbidities during the pandemic put older people at higher risk of mental health deterioration. Our research finds that older people with pre-existing health problems were more likely to deteriorate their depressive symptoms when they had 1-2 comorbidity cases.

Their probability of feeling helpless was 3.02 times more, 1.68 times more of feeling dissatisfied, and 1.65 times to experience more depressive symptoms in general. Those who had three comorbidities or more were 4.03 times more likely to feel helpless, 1.86 times more likely to feel bored, 3.60 times more likely to feel worthless, and 2.54 times more to experience more depressive symptoms.

Meanwhile, respondents without pre-existing health problems were 3.21 times more likely to feel helpless, 2.90 times more likely to feel bored, and 2.24 times more likely to experience more depressive symptoms when they had three morbidity cases or more.

In-person meetings with family or relatives reduce the possibility of feeling dissatisfied during the pandemic for older people without pre-existing health problems (odd ratio: 0.61). In contrast, it increased the probability 4.03 times to feel more helpless during the pandemic for respondents with pre-existing health problems.

Maintaining social connections through telecommunication media benefited older people, especially those without pre-existing health problems, than their counterparts. It reduces the possibility of experiencing depressive symptoms, particularly in terms of helplessness and dissatisfaction. However, respondents with pre-existing health problems who sometimes use telecommunication media to keep social interaction were less likely to feel worthless. Those who use it more often were less likely to feel dissatisfied.

Engagement in social activity during the pandemic reduces the possibility of feeling dissatisfied for older people without pre-existing health problems. Even those who often engage in social activity were less likely to deteriorate the total score of symptoms. Those with pre-existing health problems and who engage with social activity often were less likely to feel bored and have deterioration in mental health symptoms.

Our findings indicate that social support from *Posyandu* cadres, health workers, social cadres, family, or relatives benefited older people with pre-existing health problems more than their counterparts. Respondents with pre-existing health conditions who received support from *Posyandu* cadres, health workers, or social cadres were less likely to feel dissatisfied (odds ratio of 0.52) and deteriorate total depressive symptoms (odds ratio of 0.58).

In contrast, support from family or relatives increased the risk of mental health deterioration with a more intense effect on respondents without pre-existing health problems. Respondents with pre-

existing health problems who received one type of support from family or relatives were 2.14 times more likely to feel dissatisfied. No significant associations were found in other kinds of support and symptom.

Meanwhile, respondents without pre-existing health problems who receive two supports were 2.10 times more likely to feel bored and 2.17 times more likely to experience mental health symptoms in general. Those who received three supports or more were 2.36 times more likely to feel bored and 2.43 times more likely to deteriorate their total score of symptoms.

Finally, relaxation to activity and mobility restriction from July to November 2020 reduced the risk of mental health deterioration in most symptoms except worthlessness.

**Table 2 Regression Analysis Examining Determinants of Mental Health Deterioration**

Covariates	Odd Ratio of Mental Health deterioration									
	Without Pre-existing Health Problems (N=1,262)					With Pre-existing Health Problem (N=1,145)				
	Helpless	Bored	Dissatisfied	Worthless	Total Depression Score	Helpless	Bored	Dissatisfied	Worthless	Total Depression Score
<b>Sex (male as reference)</b>										
Female	1.683*	1.537*	0.714	1.691	1.183	1.603	0.886	0.505**	0.774	0.806
<b>Age (60 to 69 years as reference)</b>										
70 years and over	1.710	0.572*	0.917	1.482	0.806	1.327	0.657	0.664	0.567	0.746
<b>Residence (Rural as reference)</b>										
Urban	1.997	1.163	2.652	1.745	3.978**	2.719	1.280	1.345	0.993	2.672*
<b>Province (Bali as reference)</b>										
DIY	0.287**	0.369**	0.453**	0.275	0.271***	0.111***	0.129***	0.156***	0.321*	0.131***
DKI Jakarta	0.555	0.717	0.641	1.538	0.455**	0.228***	0.407*	0.184***	1.114	0.270***
<b>Income (Same/Increase as reference)</b>										
Decrease	1.927**	1.285	1.616**	0.601	1.238	1.477	0.894	2.553***	1.859**	1.171
<b>Number of Assistance (0 types as reference)</b>										
1-2 types	1.041	0.707	1.309	1.499	0.995	1.367	0.847	1.274	0.858	1.416
3-4 types	1.495	0.940	0.699	1.231	0.889	0.798	0.601	0.815	0.492	0.771
<b>Postpone visiting health facilities (No as reference)</b>										
Yes	1.813*	2.402***	0.781	1.520	1.485*	1.804*	1.583*	0.799	2.204**	1.531*
<b>Morbidity score (0 morbidities as reference)</b>										
1-2 morbidities	1.281	1.034	0.844	0.678	1.234	3.018***	0.922	1.682*	1.448	1.651**
3 morbidities or more	3.214***	2.902***	0.799	1.535	2.245**	4.026***	1.861*	1.097	3.598***	2.645***
<b>In-person Meeting with family and relatives (No as reference)</b>										
Yes	1.020	0.978	0.612*	0.963	0.857	4.025***	1.623	1.057	1.325	1.586
<b>Meeting with family and relatives through telecommunication media (Never as reference)</b>										
Sometimes	0.885	0.946	0.528**	0.568	0.663**	1.218	1.067	0.971	0.547*	1.116
Always/Often	0.523*	0.663	0.534**	0.555	0.518***	0.825	1.535	0.442**	0.873	1.255



Covariates	Odd Ratio of Mental Health deterioration									
	Without Pre-existing Health Problems (N=1,262)					With Pre-existing Health Problem (N=1,145)				
	Helpless	Bored	Dissatisfied	Worthless	Total Depression Score	Helpless	Bored	Dissatisfied	Worthless	Total Depression Score
<b>Social activity (Never as reference)</b>										
Sometime	1.095	1.132	0.530**	1.375	0.900	1.267	0.619	0.743	1.006	0.692
Often	0.887	0.650	0.509**	0.932	0.621**	0.639	0.400***	0.861	0.553	0.545**
<b>Social support from <i>Posyandu</i> cadres, health worker, or social cadres (No as reference)</b>										
Yes	1.469	0.734	0.799	0.349	0.813	0.899	0.673	0.514*	0.619	0.584*
<b>Social support from family and relative (0 social support as reference)</b>										
1 support	1.469	1.406	0.852	0.748	1.447	1.229	1.086	2.136*	1.132	0.961
2 supports	1.767	2.014*	1.201	1.561	2.169**	0.960	1.119	1.310	0.880	0.861
3 supports or more	2.355*	1.709	1.588	1.183	2.426***	0.969	1.103	1.765	0.800	0.954
<b>Relaxation (No/July 2020 as reference)</b>										
Yes/November 2020	0.626**	0.666**	0.368***	1.229	0.535***	0.505***	0.688*	0.439***	1.087	0.471***
<b>_cons</b>	0.00209***	0.0291***	0.0500***	0.000215***	0.0487***	0.00106***	0.0675***	0.0374***	0.00850***	0.0874***

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## **DISCUSSION**

The high risk of mental health deterioration, particularly depressive symptoms, among older people is a significant concern during the COVID-19 pandemic. Strong suggestion to stay at home and minimized interaction made older people vulnerable to being more depressed during the pandemic.

Several factors increased older people's likelihood of being depressed. Being female and living in urban areas were associated with more depressive symptoms (González-Sanguino et al., 2020). Consistent with previous studies, declining income or financial difficulties was strongly associated with higher depressive symptoms (Yee et al., 2021).

Pre-existing health problems experienced by older people determine what factors exacerbated their depression. The presence of morbidity cases increases the possibility of reporting depressive symptoms in respondents with pre-existing health problems more than their counterparts. Indeed, comorbidities might increase the severity of illness for COVID-19 patients. It is relevant with a study that found that lower health and firmer belief in severity of disease related to COVID-19 were associated with higher depressive symptoms (Skapinakis et al., 2020; González-Sanguino et al., 2020; Steptoe and Di Gessa, 2021).

Receiving more support from family and relatives increases the possibility of having more depressive symptoms in older people without pre-existing health conditions. Other research found that older people with self-perception as a burden increased their reactivity to depressive symptoms (Losada-Baltar et al., 2021). In this study, those effects might worsen for respondents who had no pre-existing health problems, yet diagnosed with more comorbidities during the pandemic.

Descriptive statistics showed that the percentage of older people with mental health deterioration in November 2020 was less than in July 2020. The regression result confirmed that relaxation to restriction in November 2020 significantly reduces the probability of depressive symptoms worsening among older people. Another study in England also found that a high level of depression occurred in the early stages of lockdown but subsequently declined along with individual adaptation to the circumstances (Fancourt, Steptoe, and Bu, 2021).

Several findings in this study are helpful in assessing the need for support related to older people's mental health in Indonesia. However, this study had several limitations. The sample of this study was not nationally representative. The target provinces and districts/cities were selected purposively when SILANI was established in 2019. Moreover, since this study used the telephone survey method, older people whose households did not have a telephone contact number were excluded.

## **CONCLUSION**

Our findings showed some differences in determinants of mental health deterioration among older people with and without pre-existing health problems. Social interaction aspects such as in-person and online meet ups, as well as social activity, benefited older people, especially the one without pre-existing health problems to reduce the possibility of mental health deterioration than their counterparts who did not maintain social interaction. Nonetheless, social supports from family or relatives due to the increasing comorbidity cases in the prolonged pandemic.

On the other hand, older people with pre-existing health problems were more benefited by social support from *Posyandu* cadres, health workers, or social cadres and less negatively affected by

support from family and relatives. Relaxation to social activity restriction significantly reduced the possibility of mental health deterioration; however, considering the high risk of morbidity and mortality on older people, adherence to health protocols must be maintained. Identifying these determinants could help policymakers plan proper supports for older people during the pandemic.

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