**Supplemental Figure 1**

*Sociodemographic Differences in Social Connection During COVID-19*

|  |  |
| --- | --- |
| 1. *Structural aspect*
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|  |  |
| 1. *Functional aspect*
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|  |  |
| 1. *Quality aspect*
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|  |  |

**Supplemental Table 1**

*Logistic Regressions Predicting Increased Loneliness During the COVID-19 Pandemic (N=3,804)*

|  |  |  |  |
| --- | --- | --- | --- |
|   | OR | 95% CI | *p* |
| **Sociodemographic factors** |  |  |  |
| Aged 75+ (ref: Aged 54−74) | 0.75  | (0.60,0.95) | .019 |
| Women | 1.55  | (1.23,1.94) | <.001 |
| Racial/ethnic minority (ref: Non-Hispanic White) | 0.70  | (0.54,0.91) | .006 |
| Education of some college or above (ref: High school or less) | 1.30  | (1.05,1.61) | .017 |
|  Marital status (ref: Married/partnered)  |  |  |  |
|  Separated/divorced | 1.44  | (1.09,1.90) | .011 |
|  Widowed | 1.40  | (1.04,1.87) | .025 |
|  Never married | 0.99 | (0.60,1.61) | .957 |
|  |  |  |  |
| **Changes in social connection during COVID-19** |  |  |  |
|  *Structural aspect* |   |   |  |
| Number of limited family social gatherings (range: 0−5) | 1.06 | (0.98,1.14) | .120 |
| Not enough in-person contact with people outside household  | 10.07 | (6.88,14.74) | <.001 |
|  *Functional aspect* |   |   |  |
| Received instrumental support from anyone (ref: No changes) |   |   |  |
| Not needed | 1.31  | (0.95,1.80) | .095 |
| Less often | 0.85 | (0.42,1.73) | .646 |
| More often | 1.42  | (0.99,2.04) | .053 |
| Received emotional support from anyone (ref: No changes) |   |   |  |
| Not needed | 0.88 | (0.66,1.16) | .355 |
| Less often | 2.28  | (1.13,4.59) | .021 |
| More often | 2.00 | (1.53,2.61) | <.001 |
| *Quality aspect* |   |   |  |
| Worse quality of relationships with family members | 1.69  | (1.23,2.32) | .001 |
|  Worse quality of relationships with friends/neighbors | 1.44 | (1.09,1.91) | .012 |

*Note*. Estimates are weighted.

**Supplemental Table 2**

*Logistic Regressions Predicting Increased Loneliness During the COVID-19 Pandemic (N=3,804)*

|  |  |  |  |
| --- | --- | --- | --- |
|   | OR | 95% CI | *p* |
|  *Structural aspect* |   |   |  |
| Number of limited family social gatherings (range: 0−5) | 1.23  | (1.16,1.31) | <.001 |
| Not enough in-person contact with people outside household  | 12.67  | (8.78,18.27) | <.001 |
|  *Functional aspect* |   |   |  |
| Received instrumental support from anyone (ref: No changes) |   |   |  |
| Not needed | 1.03 | (0.78,1.36) | .829 |
| Less often | 1.29 | (0.66,2.53) | .464 |
| More often | 1.87  | (1.35,2.57) | <.001 |
| Received emotional support from anyone (ref: No changes) |   |   |  |
| Not needed | 0.68  | (0.54,0.87) | .002 |
| Less often | 2.33  | (1.29,4.22) | .005 |
| More often | 2.41  | (1.88,3.09) | <.001 |
| *Quality aspect* |   |   |  |
| Worse quality of relationships with family members | 2.61  | (1.99,3.43) | <.001 |
|  Worse quality of relationships with friends/neighbors | 2.33 | (1.81,2.99) | <.001 |

*Note*. Estimates are weighted. A series of separate models were examined for each indicator, with controlling for sociodemographic covariates (not shown for simplicity).

**Supplemental Figure 2**

*The Effects of Changes in Social Connection on Increased Loneliness*

|  |  |
| --- | --- |
| 1. *Structural aspect*
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| 1. *Functional aspect*
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|  |  |
| 1. *Quality aspect*
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|  |  |

*Note*. The models examined each variable separately, controlling for sociodemographic factors

**Supplemental Table 3**

*Logistic Regressions Predicting Increased Loneliness During the COVID-19 Pandemic by Previous Loneliness Groups*

|  |  |  |
| --- | --- | --- |
|   | PreviouslyNot Lonely(*n* = 2,375) | PreviouslyLonely (*n* = 696) |
| OR | 95% CI | *p* | OR | 95% CI | *p* |
| Lonely the same, more, or less often than before COVID-19? |   |   |  |  |  |  |
|  *Structural aspect* |   |   |  |  |  |  |
| Number of limited family social gatherings (range: 0−5) | 1.07 | (0.97,1.18) | .196 | 1.07 | (0.92,1.26) | .385 |
| Not enough in-person contact with people outside household  | 7.68  | (4.78,12.35) | <.001  | 20.14  | (6.26,64.86) | <.001 |
|  *Functional aspect* |  |  |  |  |  |  |
| Received instrumental support from anyone (ref: No changes) |  |  |  |  |  |  |
| Not needed | 1.48 | (0.98,2.23) | .062 | 1.75 | (0.89,3.45) | .104 |
| Less often | 0.98 | (0.33,2.87) | .971 | 1.06 | (0.30,3.69) | .926 |
| More often | 1.86  | (1.17,2.96) | .009 | 1.77 | (0.83,3.74) | .137 |
| Received emotional support from anyone (ref: No changes) |  |  |  |  |  |  |
| Not needed | 0.79 | (0.55,1.13) | .195 | 0.84 | (0.45,1.57) | .582 |
| Less often | 2.12 | (0.85,5.28) | .106 | 1.88 | (0.52,6.77) | .333 |
| More often | 1.80  | (1.29,2.52) | <.001 | 2.03 \* | (1.10,3.74) | .024 |
| *Quality aspect* |  |  |  |  |  |  |
| Worse quality of relationships with family members | 1.88  | (1.22,2.90) | .004 | 1.71 | (0.95,3.08) | .076 |
|  Worse quality of relationships with friends/neighbors | 1.04 | (0.72,1.49) | .837 | 2.70  | (1.43,5.10) | .002 |

*Note*. Estimates are weighted. A series of separate models were examined by the groups, with controlling for sociodemographic covariates (not shown for simplicity). The scores for previous loneliness were obtained from the respondents’ response in the prior wave (2016), those with the score of 6 or higher were categorized as ‘lonely.’