**Supplementary material 1.** Loneliness and Social Isolation Scale (LSIS)

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| **Loneliness and Social Isolation Scale**Mark the box which best describes you during the last month. |
| 1. I feel lonely  | 0. completely disagree | 1. Somewhat disagree | 2. Somewhat agree | 3. Completely agree |
| 2. I feel isolated  | 0. completely disagree | 1. Somewhat disagree | 2. Somewhat agree | 3. Completely agree |
| 3. I can comfortably rely on friends or family. | 3. completely disagree | 2. Somewhat disagree | 1. Somewhat agree | 0. Completely agree |
| 4. There are people who can help me with everyday matters. | 3 completely disagree | 2. Somewhat disagree | 1. Somewhat agree | 0. Completely agree |
| 5. With how many people are you close enough to meet in person at least once a month, or to contact at least once a week? (including family members, relatives, and friends)  | 3. 0 | 2. 1~2 | 1. 3~6 | 0. 7 or more |
| 6. On average, how many minutes to you spend speaking with friends or family? (phone, message, or messenger apps)  | 3. None | 2. Up to 15 minutes | 1. 15 minutes to 1 hour | 0. More than 1 hour |

*Note*. Loneliness: questions 1 and 2; Social support: questions 3 and 4; Social network: questions 5 and 6.

**Supplementary material 2.** Additional analysis of association between loneliness, social isolation, and common psychiatric disorders

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|  | **Model 1 (95% CI)** | **Model 2 (95% CI)** | **Model 3 (95% CI)** |  **interaction effect** |
| **Psychiatric disorder** | **LO** | **SO** | **LS** | **LO** | **SO** | **LS** | **LO** | **SO** | **LS** | ***P*-value** |
| Major depressive disorder | 7.75(6.15-9.78)\*\*\* | 0.76(0.36-1.59) | 15.92(11.46-22.11)\*\*\* | 8.07(6.36-10.24)\*\*\* | 0.82(0.39-1.75) | 17.77(12.62-25.03)\*\*\* | 8.71(6.77-11.21)\*\*\* | 0.88(0.41-1.86) | 17.47(12.22-24.98)\*\*\* | <0.001 |
| Generalized anxiety disorder | 4.31(2.66-7.00)\*\*\* | 1.23(0.37-4.06) | 9.77(5.46-17.50)\*\*\* | 4.21(2.57-6.88) \*\*\* | 1.33(0.40-4.42) | 10.43(5.72-19.01) \*\*\* | 3.69(2.20-6.20)\*\*\* | 1.19(0.36-3.99) | 8.21(4.33-15.55)\*\*\* | 0.024 |
| Specific phobia | 1.65(1.23-2.21)\*\* | 0.75(0.40-1.42) | 1.67(1.00-2.78)\* | 1.61(1.19-2.18)\*\* | 0.82(0.43-1.56) | 1.75(1.04-2.96)\* | 1.64(1.20-2.24)\*\* | 0.81(0.43-1.54) | 1.75(1.03-2.97)\* | 0.965 |
| Post traumatic stress disorder | 4.19(2.57-6.84)\*\*\* | 0.74(0.16-3.38) | 4.44(2.05-9.58)\*\*\* | 4.28(2.60-7.03) \*\*\* | 0.79(0.17-3.64) | 4.81(2.20-10.54) \*\*\* | 3.78(2.24-6.38)\*\*\* | 0.72(0.16-3.33) | 3.90(1.73-8.80)\*\* | 0.023 |
| Alcohol use disorder | 2.38(1.92-2.96)\*\*\* | 1.14(0.74-1.74) | 4.83(3.50-6.65)\*\*\* | 2.67(2.13-3.35)\*\*\* | 1.08(0.70-1.67) | 5.31(3.77-7.48)\*\*\* | 2.94(2.31-3.74)\*\*\* | 1.13(0.73-1.75) | 5.71(3.99-8.17)\*\*\* | <0.001 |
| Tobacco use disorder | 1.55(1.21-2.01)\*\* | 0.96(0.60-1.55) | 3.47(2.44-4.93)\*\*\* | 1.75(1.33-2.30)\*\*\* | 0.83(0.50-1.35) | 3.69(2.47-5.49)\*\*\* | 1.89(1.42-2.52)\*\*\* | 0.84(0.51-1.38) | 3.97(2.61-6.03)\*\*\* | 0.005 |
| Anxiety disorder | 2.65(2.11-3.33)\*\*\* | 0.79(0.46-1.36) | 3.48(2.42-4.99)\*\*\* | 2.69(2.12-3.34)\*\*\* | 0.87(0.50-1.50) | 3.82(2.62-5.57) \*\*\* | 2.64(2.07-3.37)\*\*\* | 0.85(0.49-1.48) | 3.56(2.42-5.23)\*\*\* | 0.690 |
| Any psychiatric disorder | 2.97(2.51-3.52)\*\*\* | 0.91(0.66-1.25) | 7.39(5.37-10.18)\*\*\* | 3.12(2.63-3.71)\*\*\* | 0.88(0.64-1.22) | 7.59(5.48-10.52)\*\*\* | 3.30(2.76-3.95)\*\*\* | 0.90(0.65-1.24) | 7.65(5.49-10.67)\*\*\* | <0.001 |
| Any psychiatric disorder(excluding alcohol and tobacco use disorder) | 4.40(6.64-5.32)\*\*\* | 0.73(0.45-1.19) | 8.62(6.37-11.68)\*\*\* | 4.62(3.80-5.63)\*\*\* | 0.81(0.49-1.32) | 10.14(7.36-13.95)\*\*\* | 4.77(3.88-5.86)\*\*\* | 0.83(0.51-1.35) | 9.76(7.03-13.55)\*\*\* | 0.011 |

compared to the NO group, Model 1 unadjusted, Model 2 adjusted for age and gender, Model 3 adjusted for age, gender, education, marital status and income

\**P* < 0.05, \*\**P* < 0.01, \*\*\**P* < 0.001.