**Title:** Does digital technology reduce health disparity? Investigating difference of depression stemming from socioeconomic status among Chinese older adults

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**Additional file:**

**Socioeconomic status and depression**

When we replacing variable “father’s education” with “mother’s education” to indicate parental education, model 1 is specified as

$$Doutcome=β\_{0}+β\_{1}edu\_{mother}+β\_{2}srh\_{childhood}+β\_{3}edu+ β\_{4}income$$

$$ + β\_{5}hukou +β\_{6-8}control variables+e $$

where $β\_{1},β\_{2},β\_{3},β\_{4}, and β\_{5}$ determine the effects of SES.

Table 1. *OLS analysis and quantile regression estimation for model 1*

|  |  |
| --- | --- |
| Variables | Dependent variable: depression |
|  | OLS | Quantile regressionregression |
|  |  | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 |
|  | (1) | (2) | (3) | (4) | (5) | (6) |
| **Individual socioeconomic status** |  |  |  |  |
| Mother's education | -0.224 | -0.234 | -0.268 | -0.371 | -0.406 | -0.481 |
| (0.130) | (0.173) | (0.202) | (0.253) | (0.320) | (0.355) |
| SHR-16 | -0.445\*\*\* | -0.457\*\*\* | -0.482\*\*\* | -0.565\*\*\* | -0.645\*\*\* | -0.681\*\*\* |
| (0.055) | (0.062) | (0.072) | (0.086) | (0.102) | (0.128) |
| Education | -0.845\*\*\* | -0.814\*\*\* | -1.010\*\*\* | -1.290\*\*\* | -1.860\*\*\* | -0.934\*\* |
|  | (0.173) | (0.244) | (0.253) | (0.387) | (0.319) | (0.443) |
| Income | -0.666\*\*\* | -0.629\*\*\* | -0.761\*\*\* | -0.861\*\*\* | -1.100\*\*\* | -1.300\*\*\* |
|  | (0.047) | (0.056) | (0.060) | (0.076) | (0.090) | (0.100) |
| Hukou | -0.302\* | -0.228 | -0.269 | -0.369\* | -0.241 | -0.174 |
|  | (0.164) | (0.168) | (0.202) | (0.220) | (0.298) | (0.353) |
| **Other**  |  |  |
| Age | 0.017\*\* | 0.008 | 0.010 | 0.007 | 0.012 | 0.040\*\* |
|  | (0.007) | (0.008) | (0.009) | (0.011) | (0.013) | (0.017) |
| Gender | -1.290\*\*\* | -1.230\*\*\* | -1.310\*\*\* | -1.950\*\*\* | -2.180\*\*\* | -2.650\*\*\* |
|  | (0.133) | (0.155) | (0.181) | (0.221) | (0.248) | (0.310) |
| Marital | -1.400\*\*\* | -1.340\*\*\* | -1.530\*\*\* | -1.860\*\*\* | -1.970\*\*\* | -2.620\*\*\* |
|  | (0.162) | (0.218) | (0.238) | (0.318) | (0.287) | (0.421) |
| Constant | 16.100\*\*\* | 15.100\*\*\* | 18.100\*\*\* | 22.100\*\*\* | 27.100\*\*\* | 31.000\*\*\* |
|  | (0.746) | (0.886) | (0.979) | (1.210) | (1.420) | (1.660) |
| Observations | 8,821 | 8,821 | 8,821 | 8,821 | 8,821 | 8,821 |
| R2 | 0.110 |  |  |  |  |  |
| Pseudo R2 |  | 0.597 | 0.598 | 0.596 | 0.610 | 0.604 |
| *Note.* a standardize coefficients are reported; standard errors in parentheses.b \*\*\*p < 0.01, \*\*p < 0.05, \*p < 0.1. |

**Moderating effect of digital technology**

We use model 2 to investigate the moderating effect of digital technology usage including Internet usage and mobile phone usage, respectively. Table 2 shows the estimation of interaction effect of SES and mobile phone usage.

Table 2. *OLS analysis and quantile regression estimation for model 2 (mobile phone usage)*

|  |  |
| --- | --- |
| Variables | Dependent variable: depression |
|  | OLS | Quantile regressionregression |
|  |  | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 |
|  | (1) | (2) | (3) | (4) | (5) | (6) |
| **Individual socioeconomic status** |  |  |
| Father's education | -0.203 | -0.260\* | -0.388\*\* | -0.180 | -0.067 | -0.185 |
| (0.132) | (0.144) | (0.171) | (0.193) | (0.228) | (0.297) |
| SRH-16 | -0.442\*\*\* | -0.446\*\*\* | -0.510\*\*\* | -0.547\*\*\* | -0.650\*\*\* | -0.676\*\*\* |
| (0.055) | (0.062) | (0.074) | (0.085) | (0.098) | (0.121) |
| Education | -0.563\*\* | -0.550\* | -0.557 | -0.802 | -1.290\*\*\* | -0.846\* |
|  | (0.228) | (0.308)\* | (0.355) | (0.499) | (0.446) | (0.507) |
| Income | -0.632\*\*\* | -0.620\*\*\* | -0.764\*\*\* | -0.871\*\*\* | -1.180\*\*\* | -1.310\*\*\* |
|  | (0.064) | (0.076) | (0.086) | (0.111) | (0.125) | (0.144) |
| Hukou | -0.377 | -0.254 | -0.206 | -0.387 | -0.408 | -0.109 |
|  | (0.239) | (0.227) | (0.279) | (0.319) | (0.400) | (0.523) |
| **Digital technology usage** |  |  |  |  |  |
| Mobile phone usage | 1.210\* | 1.260 | 1.140 | 0.764 | 0.250 | 0.088 |
|  | (0.671) | (0.868) | (0.944) | (1.260) | (1.290) | (1.590) |
| **Other**  |  |  |
| Age | 0.019\*\*\* | 0.007 | 0.012 | 0.017 | 0.020 | 0.039\*\* |
|  | (0.007) | (0.008) | (0.009) | (0.011) | (0.013) | (0.016) |
| Gender | -1.350\*\*\* | -1.320\*\*\* | -1.460\*\*\* | -1.980\*\*\* | -2.210\*\*\* | -2.660\*\*\* |
|  | (0.133) | (0.160) | (0.183) | (0.218) | (0.239) | (0.300) |
| Marital | -1.280\*\*\* | -1.300\*\*\* | -1.400\*\*\* | -1.820\*\*\* | -1.920\*\*\* | -2.610\*\*\* |
|  | (0.165) | (0.205) | (0.248) | (0.310) | (0.284) | (0.408) |
| **Interaction effect** |  |  |  |  |  |  |
| Mobile phone usage \* education | -0.561\* | -0.667 | -0.894\* | -0.786 | -0.908 | -0.190 |
| (0.331) | (0.491) | (0.505) | (0.757) | (0.594) | (0.797) |
| Phone usage \* income | -0.053 | -0.030 | 0.004 | 0.045 | 0.106 | 0.050 |
| (0.083) | (0.095) | (0.111) | (0.135) | (0.152) | (0.192) |
| Mobile phone usage \* hukou | 0.026 | -0.136 | -0.242 | -0.230 | 0.214 | -0.404 |
| (0.318) | (0.312) | (0.379) | (0.415) | (0.518) | (0.703) |
| Constant | 15.400\*\*\* | 14.700\*\*\* | 17.600\*\*\* | 20.900\*\*\* | 26.500\*\*\* | 30.800\*\*\* |
|  | (0.839) | (0.992) | (1.140) | (1.420) | (1.560) | (1.940) |
| Observations | 8,853 | 8,853 | 8,853 | 8,853 | 8,853 | 8,853 |
| R2 | 0.110 |  |  |  |  |  |
| Pseudo R2 |  | 0.595 | 0.596 | 0.596 | 0.610 | 0.602 |
| *Note.* a standardize coefficients are reported; standard errors in parentheses.Notes: b \*\*\*p < 0.01, \*\*p < 0.05, \*p < 0.1. |

Figure 1. *Effects of individual socioeconomic status on depression in older Chinese adults*

*Note.* The group shows the effects of individual socioeconomic status measures on depression CES-D score quantiles (green solid line). The x-axis is labeled with the quantile level at which the effects are estimated. The y-axis refers to the effect. The 95% confidence intervals of the effects on quantile are in the shaded area. The black dashed line refers the OLS effect of individual socioeconomic status at the mean CES-D scores.