# **Supplementary Information**

Knowledge, socio-cognitive perceptions and the practice of hand hygiene and social distancing during the COVID-19 pandemic: A cross-sectional study of UK university students

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**Table S1: Frequency of hand hygiene behaviour activities**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **How often do you practise the following activities?** | ***N*** | **Rarely/never*****n* (%)** | **Mostly*****n* (%)** | **Always*****n* (%)** |
| Wash hands after using the toilet | 293 | 4 (1.4) | 48 (16.4) | 241 (82.3) |
| Wash hands before eating or handling food | 293 | 25(8.5) | 146 (49.8) | 122 (41.6) |
| Wash hands after contact with animals or pets (blank if no contact) | 229 | 71 (24.2) | 66 (22.5) | 92 (31.4) |
| Wash hands after handling money or public equipment | 293 | 62 (21.2) | 98 (33.4) | 133 (45.4) |
| Wash hands after coughing or sneezing | 292 | 59 (20.1) | 125 (42.7) | 108 (36.9) |
| Wash hands before touching face, eyes, nose, mouth | 293 | 129 (44.0) | 109 (37.2) | 55 (18.8) |
| If sneeze or cough, then sneeze of cough into tissue or sleeve | 293 | 33 (11.3) | 94 (32.1) | 166 (56.7) |
| Put tissues in the bin immediately after use | 293 | 18 (6.1) | 101 (34.5) | 174 (59.4) |
| Hand hygiene behaviour score - mean (SD)/ median (IQR) a | 293 | 1.78 (± 0.69)/ 1.75 (1.0) |

Abbreviations: SD, standard deviation; IQR, interquartile range

a Hand hygiene behaviour score was normally distributed by visual inspection of histogram but was significantly different from a normal distribution by the Kolmogorov-Smirnov test (*p* = 0.035). Both mean and median measure of central tendency are shown.

**Table S2: Frequency of social distancing behaviour activities**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **How often do you practise the following activities?** | ***N*** | **Rarely/mostly*****n* (%)** | **Mostly*****n* (%)** | **Always*****n* (%)** |
| Staying at home when sick or have a cold | 279 | 2 (0.7) | 26 (9.3) | 251 (90.0) |
| Isolating at home if have high temperature or new, continuous cough until symptoms stop or at least 7 days | 280 | 3 (1.1) | 13 (4.6) | 264 (94.3) |
| Isolating at home for 14 days if someone in household develops high temperature or new, continuous cough | 280 | 3 (1.1) | 23 (7.8) | 255 (91.1) |
| Shopping only for basic necessities, as infrequently as possible | 280 | 4 (1.4) | 80 (28.6) | 196 (70.0) |
| Restricting to one form of outside exercise a day alone or with members of your household | 281 | 7 (2.5) | 62 (22.1) | 212 (75.4) |
| Not meeting in groups | 281 | 3 (1.1) | 12 (4.3) | 266 (94.7) |
| Staying at home except for essential shopping, exercise, medical need or work where you cannot work from home | 280 | 3 (1.1) | 34 (12.1) | 243 (86.8) |
| If outside the house, staying at least 2 m away from others not in household | 281 | 4 (1.4) | 61 (21.7) | 216 (76.9) |
| Social distancing behaviour score median (IQR) a | 281 | 2.75 (0.5) |

Abbreviations: SD, standard deviation; IQR, interquartile range

a Social distancing behaviour score was not normally distributed by visual inspection of histogram and was significantly different from a normal distribution by the Kolmogorov-Smirnov test (*p* < 0.001), indicating median should be used. Mean (SD): 2.69 (0.44).

**Table S3: Risk perception: probability, susceptibility and severity**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Risk Perception – *n* (%)** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** |
|  | Extremely unlikely Extremely likely |
| Probability | 12(4.1) | 47(16.0) | 53(18.1) | 42(14.3) | 44(15.0) | 48(16.4) | 31(10.6) | 10(3.4) | 6(2.0) |
|  | Not at all susceptible Very susceptible |
|  Susceptibility | 10(3.4) | 47(16.0) | 56(19.1) | 44(15.0) | 52(17.7) | 31(10.6) | 33(11.3) | 14(4.8) | 6(2.0) |
|  | Not severe Very severe |
| Severity | 25(8.5) | 54(18.4) | 59(20.1) | 39(13.3) | 30(10.2) | 35(11.9) | 29(9.9) | 18(6.1) | 4(1.4) |
| Overall risk perception score – mean (SD)/median (IQR) a | 4.31 (±1.55)/ 4.33 (2.0) |

a Risk perception score was approximately normally distributed by visual inspection of histogram but was significantly different from a normal distribution by the Kolmogorov-Smirnov test (*p* = 0.001). Both mean and median measure of central tendency are shown.

**Figure S1: Participant responses for knowledge of COVID-19 risk groups and symptoms**

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**Table S4: Attitudes, self-efficacy, time factors and habit in hand hygiene behaviour**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Domain and belief** | ***N*** | **Strongly agree*****n*(%)** | **Agree*****n* (%)** | **Neutral*****n* (%)** | **Disagree*****n* (%)** | **Strongly disagree*****n* (%)** |
| **Attitude (Advantages)** |
|  I believe that regular handwashing with soap and water will help prevent me from becoming infected with coronavirus | 293 | 134(45.7) | 135(46.1) | 17(5.8) | 7(2.4) | 0(0) |
| I like the feeling of washing my hands | 293 | 60(20.5) | 111 (37.9) | 91 (31.1) | 25 (8.5) | 6(2.0) |
| I believe that regular handwashing with soap and water will help prevent vulnerable people from becoming infected with coronavirus | 293 | 114(38.9) | 139(47.4) | 26(8.9) | 12(4.1) | 2(0.7) |
| I believe that believe that covering my mouth and nose with a tissue or sleeve when I cough or sneeze will help prevent others from becoming infected with coronavirus | 293 | 161(54.9) | 107(36.5) | 19(6.5) | 6(2.0) | 0(0) |
| **(Attitude) Disadvantages** |
| I think that regular handwashing with soap and water is too much effort | 293 | 9(3.1) | 20(6.8) | 27(9.2) | 104(35.5) | 133(45.4) |
| I think that washing my hands can hurt them | 293 | 16(5.5) | 63(21.5) | 50(17.1) | 79(27.0) | 85(29.0) |
| I think that covering my mouth and nose with a tissue or sleeve when I cough or sneeze, is too much effort | 292 | 3(1.0) | 11(3.8) | 14(4.8) | 70(23.9) | 194(66.2) |
| **Time factor** |
| Even if I am busy, I manage to wash my hands with soap after the toilet | 293 | 194(66.2) | 69(23.5) | 21(7.2) | 8(2.7) | 1(0.3) |
| It takes too much time to wash my hands with soap each time I prepare food | 293 | 6(2.0) | 27(9.2) | 48(16.4) | 96(32.8) | 116(39.6) |
| Hand-washing with soap and water for 20 seconds is quick and very easy to do | 293 | 138(47.1) | 103(35.2) | 29(9.9) | 20(6.8) | 3(1.0) |
| **Habit/automaticity** |
| I sometimes start washing my hands without even realizing I’m doing it | 291 | 107(36.5) | 83(28.3) | 32(10.9) | 44(15.0) | 25(8.5) |
| I feel strange when I don’t wash my hands with soap after the toilet | 292 | 165(56.3) | 61(20.8) | 35(11.9) | 25(8.5) | 6(2.0) |
| Washing my hands with soap before I eat a meal is something I do automatically | 293 | 67(22.9) | 71(24.2) | 55(18.8) | 73(24.9) | 27(9.2) |
| If I feel I am going to cough or sneeze, I have a tissue or my sleeve ready to cover my mouth and nose without even realizing I’m doing it | 293 | 98(33.4) | 101(34.5) | 39(13.3) | 45(15.4) | 10(3.4) |
| **Self-Efficacy – Hand hygiene** |
| I am confident that I can practise handwashing correctly when at home | 293 | 195(66.6) | 78(26.6) | 16(5.5) | 3(1.0) | 1(0.3) |
| I am confident that I can practise handwashing correctly when away from home | 293 | 157(53.6) | 88(30.0) | 22(7.5) | 25(8.5) | 1(0.3) |
| I am confident that I can practise good cough etiquette | 293 | 184(62.8) | 87(29.7) | 19(6.5) | 3(1.0) | 0 |

**Table S5: Attitudes, social support, self-efficacy, and trust in social distancing behaviour**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Domain and belief** | ***N*** | **Strongly agree*****n* (%)** | **Agree*****n* (%)** | **Neutral*****n* (%)** | **Disagree*****n* (%)** | **Strongly disagree*****n* (%)** |
| **Advantages** |
| I believe social distancing will help protect me from getting the novel coronavirus | 293 | 174(59.4) | 101(34.8) | 12(4.1) | 4(1.4) | 1(0.3) |
| I believe social distancing will help protect the vulnerable from getting coronavirus | 293 | 201(68.6) | 79(27.0) | 10(3.4) | 2(0.7) | 1(0.3) |
| I believe that social distancing will protect the NHS from having too many cases of COVID-19 in hospital at once | 292 | 198(67.8) | 83(28.4) | 6(2.1) | 3(1.0) | 2(0.7) |
| **Disadvantages** |
| I think I miss meeting up with family and friends | 291 | 173(59.5) | 69(23.7) | 28(9.6) | 14(4.8) | 7(2.4) |
| I think I (or someone close to me) will lose my job | 293 | 72(24.6) | 101(34.5) | 59(20.1) | 47(16.0) | 14(4.8) |
| I think I will get too bored during the time of social distancing | 292 | 64(21.9) | 82(28.1) | 52(17.8) | 68(23.3) | 26(8.9) |
| **Social Support** |
| My family and friends avoid crowded areas | 291 | 165(56.7) | 105(35.8) | 15(5.2) | 5(1.7) | 1(0.3) |
| My family and friends avoid social contacts | 290 | 154(53.1) | 106(36.6) | 21(7.2) | 7(2.4) | 2(0.7) |
| My friends encourage me to meet with them, against government guidelines | 293 | 12(4.1) | 24(8.2) | 11(3.8) | 78(26.6) | 168(57.3) |
| **Trust** |
| I think the authorities should restrict personal liberty rights to combat the novel coronavirus | 292 | 47(16.1) | 85(29.1) | 94(32.3) | 47(16.1) | 19(6.5) |
| I think the decisions that have been made to reduce the spread of the novel coronavirus are fair | 293 | 118(40.3) | 118(40.3) | 30(10.2) | 20(6.8) | 7(2.4) |
| I think the authorities should relax the restrictions even if there are still many new cases of COVID-19 emerging | 293 | 8(2.7) | 26(8.9) | 26(8.9) | 68(23.2) | 165(56.3) |
| **Self-efficacy** |
| I am confident that I can practise social distancing from family and friends who do not live in my household | 293 | 177(60.4) | 90(30.7) | 17(5.8) | 6(2.0) | 3(1.0) |
| I am confident that I can practise social distancing when I am outside for essential activities | 292 | 139(47.6) | 106(36.3) | 27(9.2) | 17(5.8) | 3(1.0) |
| I am confident that I can practise social distancing when I am outside for exercise | 293 | 166(56.7) | 100(34.1) | 16(5.5) | 10(3.4) | 1(0.3) |

**Table S6: Correlation Matrix for general and hand hygiene related variables**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|   | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) |
| Age (1) | 1.00 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Gender (Male/Female) (2) | -0.09 | 1.00 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Ethnicity (White/Minorities) (3) | 0.05 | -0.06 | 1.00 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Student Status (UK/International) (4) | 0.11 | 0.03 | **-.14\*** | 1.00 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Health Course (5) | 0.04 | -0.11 | **-.12\*** | -0.07 | 1.00 |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Infection exposure (6) | 0.06 | 0.02 | 0.00 | -0.07 | -.02 | 1.00 |   |   |   |   |   |   |   |   |   |   |   |   |
| Disease knowledge (7) | 0.08 | -0.09 | 0.06 | -0.03 | 0.00 | -0.01 | 1.00 |   |   |   |   |   |   |   |   |   |   |   |
| Risk perception (8) | **.14\*** | -0.11 | 0.08 | -0.08 | 0.05 | **.24\*\*** | 0.03 | 1.00 |   |   |   |   |   |   |   |   |   |   |
| Self-efficacy- infection avoidance (9) | **-.14\*** | 0.04 | -0.03 | 0.08 | -.01 | **-.19\*\*** | -0.02 | **-.42\*\*** | 1.00 |   |   |   |   |   |   |   |   |   |
| Hand hygiene knowledge (10) | 0.02 | -0.01 | **.17\*\*** | -0.10 | -.08 | -0.03 | -0.03 | 0.02 | 0.01 | 1.00 |   |   |   |   |   |   |   |   |
| Hand Hygiene Compliance (11) | 0.03 | -0.10 | 0.01 | 0.03 | 0.00 | -0.01 | 0.07 | **.15\*\*** | -0.06 | -.01 | 1.00 |   |   |   |   |   |   |   |
| Hand hygiene behaviour (12) | 0.01 | **-.23\*\*** | -0.08 | -0.07 | 0.04 | 0.11 | 0.10 | **.20\*\*** | -0.08 | -.07 | **.26\*\*** | 1.00 |   |   |   |   |   |   |
| Attitude hand hygiene (13) | -0.03 | -0.10 | -0.06 | 0.01 | -.01 | -0.01 | 0.06 | -0.05 | **0.12\*** | 0.10 | **.13\*** | **.26\*\*** | 1.00 |   |   |   |   |   |
| Advantages hand hygiene (14) | -0.05 | -0.09 | -0.07 | -0.06 | 0.01 | -0.04 | 0.01 | 0.03 | 0.04 | 0.06 | **.12\*** | **.29\*\*** | **.69\*\*** | 1.00 |   |   |   |   |
| Disadvantages (reversed) (15) | -0.01 | -0.06 | -0.04 | 0.04 | -.02 | 0.03 | 0.06 | -0.07 | **0.13\*** | 0.03 | 0.11 | **.19\*\*** | **.84\*\*** | **.23\*\*** | 1.00 |   |   |   |
| Time factors hand hygiene (16) | -0.01 | **-.15\*\*** | 0.05 | **-.15\*** | 0.03 | 0.06 | **0.12\*** | 0.01 | 0.03 | 0.02 | **.30\*\*** | **.49\*\*** | **.51\*\*** | **.34\*\*** | **.45\*\*** | 1.00 |   |   |
| Habit hand hygiene score (17) | -0.01 | **-.20\*\*** | -0.04 | -0.09 | 0.00 | 0.06 | 0.08 | 0.10 | 0.00 | -.04 | **.22\*\*** | **.58\*\*** | **.37\*\*** | **.35\*\*** | **.28\*\*** | **.60\*\*** | 1.00 |   |
| Self-efficacy hand hygiene score (18) | 0.00 | **-.17\*\*** | 0.00 | **-.13\*** | 0.11 | 0.10 | 0.06 | 0.07 | -0.06 | 0.00 | **.23\*\*** | **.38\*\*** | **.47\*\*** | **.38\*\*** | **.36\*\*** | **.54\*\*** | **.47\*\*** | 1.00 |

Bold: \* *p* <0.05 (significant, 2-tailed); \*\* *p* <0.01 (significant, 2-tailed)

**Table S7: Correlation Matrix for general and social distancing related variables**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|   | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) |
| Age (1) | 1.00 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Gender (Male/Female) (2) | -0.09 | 1.00 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Ethnicity (White/Minorities) (3) | 0.07 | -0.07 | 1.00 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Student Status (UK/International) (4) | 0.11 | 0.04 | **-.14\*** | 1.00 |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Health Course (5) | 0.03 | -0.11 | **-.13\*** | -0.07 | 1.00 |   |   |   |   |   |   |   |   |   |   |   |   |
| Infection exposure (6) | 0.06 | 0.03 | 0.02 | -0.08 | -.03 | 1.00 |   |   |   |   |   |   |   |   |   |   |   |
| Disease knowledge (7) | **0.12\*** | -0.09 | 0.05 | -0.03 | 0.02 | -0.01 | 1.00 |   |   |   |   |   |   |   |   |   |   |
| Risk perception (8) | **0.12\*** | -0.11 | 0.08 | -0.08 | 0.05 | **0.26\*\*** | 0.06 | 1.00 |   |   |   |   |   |   |   |   |   |
| Self-efficacy- infection avoidance (9) | **-.14\*** | 0.04 | -0.04 | 0.07 | -.01 | **-.20\*\*** | -0.03 | **-.42\*\*** | 1.00 |   |   |   |   |   |   |   |   |
| Social distancing knowledge (10) | 0.05 | **-.15\*** | 0.12 | -0.05 | -.06 | -0.04 | 0.09 | 0.05 | -0.02 | 1.00 |   |   |   |   |   |   |   |
| Social Distancing compliance (11) | -0.01 | -0.02 | -0.11 | -0.03 | 0.02 | 0.01 | -0.07 | 0.09 | 0.02 | -0.11 | 1.00 |   |   |   |   |   |   |
| Social distancing behaviour (12) | 0.03 | **-.13\*** | -.124 | -0.03 | 0.02 | 0.01 | 0.06 | 0.07 | **0.12\*** | 0.11 | **0.27\*\*** | 1.00 |   |   |   |   |   |
| Advantages social distancing (13) | -0.01 | -0.02 | -0.10 | 0.07 | -.02 | -0.06 | 0.06 | 0.03 | **0.15\*** | **0.17\*\*** | **0.17\*\*** | **0.26\*\*** | 1.00 |   |   |   |   |
| Disadvantages (reversed) (14) | 0.11 | **0.15\*** | -0.01 | **0.16\*\*** | 0.01 | **-.16\*\*** | -.13\* | -0.02 | -0.02 | 0.05 | 0.06 | 0.02 | -0.01 | 1.00 |   |   |   |
| Social support social distancing (15) | -0.06 | **-.13\*** | 0.05 | -0.05 | 0.04 | 0.01 | .120\* | 0.03 | 0.09 | **0.17\*\*** | 0.10 | **0.28\*\*** | **0.28\*\*** | 0.01 | 1.00 |   |   |
| Trust social distancing score (16) | 0.05 | -0.09 | **0.14\*** | -0.09 | 0.05 | 0.06 | 0.09 | **0.12\*** | 0.09 | **0.21\*\*** | **0.18\*\*** | **0.28\*\*** | **0.29\*\*** | 0.04 | **0.27\*\*** | 1.00 |   |
| Self-efficacy social distancing (17) | -0.02 | -0.02 | -0.09 | -0.09 | 0.08 | 0.03 | -0.03 | 0.04 | 0.06 | **0.14\*** | **0.18\*\*** | **0.43\*\*** | **0.37\*\*** | -.02 | **0.39\*\*** | **0.26\*\*** | 1.00 |

Bold: \* *p* <0.05 (significant, 2-tailed); \*\* *p* <0.01 (significant, 2-tailed)