

Appendix file 4: Other KAP studies on COVID-19

Study ID	Country	Survey Month	Sample Size	Summary of Results
Azlan 2020 ¹	Malaysia	March, April	4850	"The overall correct rate of the knowledge questionnaire was 80.5%. Most participants held positive attitudes toward the successful control of COVID-19 (83.1%), the ability of Malaysia to conquer the disease (95.9%) and the way the Malaysian government was handling the crisis (89.9%). Most participants were also taking precautions such as avoiding crowds (83.4%) and practicing proper hand hygiene (87.8%) in the week before the movement control order started. However, wearing face masks was less common (51.2%)".
Hanafiah 2020 ²	Malaysia	April	1075	"A total of 1075 individuals responded to the survey with average completion time of 5 minutes and 90% completion rate (96-99% for Demographic items, 92% for Knowledge & Perception items, and 89% for Communication items)".
Clements 2020 ³	USA	March	1034	"For every point increase in knowledge, the odds of participation in purchasing more goods (odds ratio [OR] 0.88, 95% CI 0.81-0.95), attending large gatherings (OR 0.87, 95% CI 0.81-0.93), and using medical masks (OR 0.56, 95% CI 0.50-0.62) decreased by 12%, 13%, and 44%, respectively. Gen X and millennial participants had 56% and 76% higher odds, respectively, of increased purchasing behavior compared to baby boomers. The results suggest that there is a politicization of response recommendations. Democrats had 30% lower odds of attending large gatherings (OR 0.70, 95% CI 0.50-0.97) and 48% lower odds of using medical masks (OR 0.52, 95% CI 0.34-0.78) compared to Republicans".
Roy 2020 ⁴	India	March	662	"The anxiety levels identified in the study were high. More than 80 % of the people were preoccupied with the thoughts of COVID-19 and 72 % reported the need to use gloves, and sanitizers. In this study, sleep difficulties, paranoia about acquiring COVID-19 infection and distress related social media were reported in 12.5 %, 37.8 %, and 36.4 % participants respectively. The perceived mental healthcare need was seen in more than 80 % of participants".
Reuben 2020 ⁵	Nigeria	June	589	"Respondents had good knowledge (99.5%) of COVID-19, gained mainly through the internet/social media (55.7%) and Television (27.5%). The majority of the respondents (79.5%) had positive attitudes toward the adherence of government IPC measures with 92.7, 96.4 and 82.3% practicing social distancing/self-isolation, improved personal hygiene and using face mask respectively. However, 52.1% of the respondents perceived that the government is not doing enough to curtail COVID-19 in Nigeria. Pearson's correlation showed significant relationship between knowledge of COVID-19 and attitude towards preventive measures ($r = 0.177$, $p = 0.004$, $r = 0.137$, $p = 0.001$). Although 61.8% of the respondents have no confidence in the present intervention by Chinese doctors, only 29.0% would accept COVID-19 vaccines when available"
Zhong 2020 ⁶	China	February	6910	"Among the survey completers (n=6910), 65.7% were women, 63.5% held a bachelor degree or above, and 56.2% engaged in mental labor. The overall correct rate of the knowledge questionnaire was 90%. The majority of the respondents (97.1%) had confidence that China can win the battle against COVID-19. Nearly all of the participants (98.0%) wore masks when going out in recent days. In multiple logistic regression analyses, the COVID-19 knowledge score (OR: 0.75-0.90, $P < 0.001$) was significantly associated with a lower likelihood of negative attitudes and preventive practices towards COVID-2019".

Abdelhafiz 2020 ⁷	Egypt	March	559	“The mean knowledge score was 16.39 out of 23, gained mainly through social media (66.9%), and the internet (58.3%). Knowledge was significantly lower among older, less educated, lower income participants, and rural residents. Most participants (86.9%) were concerned about the risk of infection. While 37.6% thought that their salary will be continued if they become isolated, 68.5% believed that it should be continued during this period. About 73.0% were looking forward to get the vaccine when available”
Serwaa 2020 ⁸	Ghana	March	350	“Regarding COVID-19, 62.7% had “good” knowledge about the outbreak, 68.3% had a high risk of contracting the COVID-19 infection and 81.4% had a moderate preparedness skill to prevent and control the disease. Internet (77.1%) was the major sources of information. Knowledge of COVID-19 was significantly associated with education (p<0.001), age (p=0.018), employment (p=0.011) and health-related occupation (P=0.001) but only religion was associated with risk perception”.
Lin 2020 ⁹	China	April	2446	“The mean and SD for the total knowledge score was 20.3 (SD ± 2.9) out of a possible score of 23. The social disruption and household economic impact were notable, particularly in provinces with higher cumulative confirmed cases. The majority of responses indicated a low perceived susceptibility of being infected (86.7% [95%CI 85.4–88.1]), with a fair proportion of respondents perceiving a higher severity (62.9% [95% CI 61.0–64.8]). The mean total impact score was 9.9 (SD ± 3.8) out of a possible score of 15. The mean score for STAI-S was 48.7 (SD ± 10.8), whereas the mean STAI-T score was 45.7 (SD ± 8.5). By demographics, women reported significantly higher odds for higher levels of both STAI-S (OR = 1.67) and STAI-T (OR = 1.30) compared to men. People of a younger age were also more likely to experience higher STAI-S and STAI-T. Higher perceived susceptibility and severity and impact were strong predictors of higher levels of STAI-S and STAI-T”.
Gharpure 2020 ¹⁰	USA	May	502	“1. (39 %) of respondents reported engaging in not recommended high-risk practices as washing food products with bleach, applying household cleaning or disinfectant products to bare skin, and intentionally inhaling or ingesting these products 2. Respondents who engaged in high-risk practices reported more adverse health effects as a result of using disinfectants than those who did not report engaging in these practices”.
Al-Hanawi 2020 ¹¹	Saudi Arabia	March	3388	“The mean knowledge score was 17.96 (SD= 2.24) Which is a high knowledge level. The score attitude was 28.23 (SD = 2.76 range = 6 - 30) which is optimistic attitude. The practice score was 4.34 (SD = 0.87, range: 0–5), indicating good practices. Men have less knowledge, less optimistic attitudes, and less good practice toward COVID-19, than women. Older adults are likely to have better knowledge and practices, than younger people”.
Faasse 2020 ¹²	Australia	March	3086	“1. Two thirds of respondents were at least moderately worried about a widespread COVID-19 outbreak in Australia 2. Health-behavior engagement over the previous month was lower in some demographic groups, including males and younger individuals (18-29 age group) 3. There was a substantial mismatch between respondents’ expected symptoms of infection and emerging evidence that a meaningful proportion of people who contract the novel coronavirus will experience asymptomatic infection 4. Only 0.3% believed that they personally would not experience any symptoms if they were infected 5. Uncertainty and misconceptions about COVID-19 were common, including one third of respondents who reported being unsure whether people are likely have natural or existing immunity 6. There was also uncertainty around whether specific home remedies (e.g., vitamins, saline rinses) would offer protection,

				whether the virus could spread via the airborne route, and whether the virus was human made and deliberately released”.
Naser 2020 ¹³	Jordan, Saudi Arabia, Kuwait	March, April	1208	<ol style="list-style-type: none"> 1. Moderate overall COVID-19 knowledge with a mean score of 7.93 (SD = 1.72) out of 12, 66.1%. 2. Participants had better knowledge about disease prevention and control with 83.0%. 3. The lowest sub-scale scores were for questions about disease transmission routes (43.3%). 4. High education level was an important predictor of greater COVID-19 knowledge scores (p<0.01)”
Saqlain 2020 ¹⁴	Pakistan	April, May	689	<ol style="list-style-type: none"> 1. More than half had good knowledge; 80% had good practices regarding COVID-19 and majority seek knowledge from social media. 2. Knowledge was significantly higher (OR>1.00, p<0.05) among educated and higher income participants. 3. Positive practices were significantly (OR>1.00, p<0.05) related to the older age (≥50 years), higher education, higher income and good knowledge regarding COVID-19”
Olapegba 2020 ¹⁵	Nigeria	March, April	1357	<ol style="list-style-type: none"> 1. Approximately half of the respondents opined that COVID-19 was “a biological weapon designed by Chinese government. 2. About 94% of the respondents identified “contact with airborne droplets via breathing, sneezing, or coughing” as the most common mode of transmission 3. most respondents associated COVID-19 with coughing (81.13%), shortness of breath (73.47%) and fever (62.79%). 4. “Regular hand washing and social distancing” was selected by most respondents (94.25%) as a way of preventing infection 5. 11.86% reported “consuming gins, garlic, ginger, herbal mixtures and African foods/soups” as preventive measures against COVID-19. 6. Majority of the respondents (91.73%) thought COVID-19 is deadly; and most respondents (84.3%) got ≥ 4 answers correctly. 7. It was also observed that the traditional media (TV/Radio) are the most common source of health information about COVID-19 (93.5%)”.
Lau 2020 ¹⁶	Philippines	February, March	2224	<ol style="list-style-type: none"> 1. 94.0% heard of COVID-19. 2. Traditional media sources such as television (85.5%) and radio (56.1%) were reported as the main sources of information about the virus. 3. Coughing and sneezing were identified as a transmission route by 89.5% of respondents, while indirect hand contact was the least common by 72.6% of respondents. 4. Hand washing was identified by 82.2% of respondents as a preventive measure against the virus, but social distancing by 32.4% and avoiding crowds by 40.6%. 5. A greater number of preventive measures were taken by those with more knowledge of potential transmission routes.”
Mannan 2020 ¹⁷	Bangladesh	March	435	<ol style="list-style-type: none"> 1. All of the participants agreed that they heard about COVID-19 (97.8%). 2. Most of population used social media to obtain regarding the COVID-19 information. 3. A significant proportion of had poor knowledge of its transmission and symptoms onset and showed a positive perception

				of COVID-19 prevention and control. 4. Factors such as profession and age are correlated with inadequate knowledge of COVID-19”
Meier 2020 ¹⁸	Netherlands, Germany, Italy	March	9796	“Participants indicated support for governmental measures related to avoiding social gatherings, selective closure of public places, and hand hygiene and respiratory measures (range for all measures: 95.0%-99.7%). Respondents from the Netherlands were less likely to consider a complete social lockdown effective (59.2%), compared to respondents in Germany (76.6%) or Italy (87.2%). Italian residents did not only apply enforced social distancing measures more frequently (range: 90.2%-99.3%, German and Dutch residents: 67.5%-97.0%), but also self-initiated hygienic and social distancing behaviors (range: 36.3%- 96.6%, German and Dutch residents: 28.3%-95.7%). Respondents largely reported being sufficiently informed about the COVID-19 outbreak and about behaviors to avoid infection (range across countries: 90.2%-91.1%). Information channels most commonly reported included television (range: 53.0%-82.0%), newspapers (range: 31.0%-63.0%), official health websites (range: 39.0%-54.1%), and social media (range: 40.0%-55.8%). We observed no major changes in answers over time”.
Abir 2020 ¹⁹	Bangladesh	March & May	1005	“The mean knowledge (8.4 vs. 8.1, P=0.022) and risk perception (11.2 vs. 10.6, P < 0.001) scores differ significantly between early and late lockdown. Compared to the early lockdown period, the scores for perceived risk of contracting COVID-19 decreased significantly while public knowledge about COVID-19 was lower but not statistically significant”.
Li 2020 ²⁰	China	February	4607	“The participants indicated that they had medium level of knowledge about the COVID-19 (3.56 out of 5). Moreover, participants perceived the COVID-19 to be highly severe (4.09 out of 5) and modestly controllable (3.25 out of 5). Regarding their emotional and behavioral reactions, the results showed that the COVID-19 did not change much of the frequency of participants’ positive and negative feelings and a range of behavior, with the mean score ranging from 2.61 to 3.77. In fact, participants indicated that the frequencies of sleep problem, aggression, and substance use after the outbreak were slightly lower compared to the ones before the outbreak of the COVID-19. As for social participation, participants appeared to not very actively participate in the social events regarding the COVID-19 (1.75 out of 4). However, participants reported that they displayed intensive precautionary behavior to prevent the COVID-19 (3.33 out of 4)”.
Kwok 2020 ²¹		January-February	1715	“Analysis from 1715 complete responses indicated high perceived susceptibility (89%) and high perceived severity (97%). Most respondents were worried about COVID-19 (97%), and had their daily routines disrupted (slightly/greatly: 98%). The anxiety level, measured by the Hospital Anxiety and Depression Scale, was borderline abnormal (9.01). Nearly all respondents were alert to the disease progression (99.5%). The most trusted information sources were doctors (84%), followed by broadcast (57%) and newspaper (54%), but they were not common information sources (doctor: 5%; broadcast: 34%; newspaper: 40%). Only 16% respondents found official websites reliable. Enhanced personal hygiene practices and travel avoidance to China were frequently adopted (>77%) and considered effective (>90%). The adoption of social-distancing measures was lower (39%-88%), and their drivers for greater adoption include: being female (adjusted odds ratio [aOR]:1.27), living in the New Territories (aOR:1.32-1.55), perceived as having good understanding of COVID-19 (aOR:1.84) and being more anxious (aOR:1.07)”.
Geldsetze	United	March	5974	“US and UK participants’ median estimate for the probability of a fatal disease course among those infected with severe

r 2020 ²²	States and United Kingdom			acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was 5.0% (IQR 2.0%-15.0%) and 3.0% (IQR 2.0%-10.0%), respectively. Participants generally had good knowledge of the main mode of disease transmission and common symptoms of COVID-19. However, a substantial proportion of participants had misconceptions about how to prevent an infection and the recommended care-seeking behavior. For instance, 37.8% (95% CI 36.1%-39.6%) of US participants and 29.7% (95% CI 28.1%-31.4%) of UK participants thought that wearing a common surgical mask was "highly effective" in protecting them from acquiring COVID-19, and 25.6% (95% CI 24.1%-27.2%) of US participants and 29.6% (95% CI 28.0%-31.3%) of UK participants thought it was prudent to refrain from eating at Chinese restaurants. Around half (53.8%, 95% CI 52.1%-55.6%) of US participants and 39.1% (95% CI 37.4%-40.9%) of UK participants thought that children were at an especially high risk of death when infected with SARS-CoV-2".
Islam 2020 ²³	Bangladesh	N/A	190	"The respondents (n=189) who took part in the survey seems to be aware of the facts of COVID-19. 73.4% responded that they have good knowledge on COVID-19, whereas 3.2% of respondent have low level of knowledge. 23% have an average knowledge. The respondents were mainly professionals and students over 18. That is why, most of them were aware of the facts of COVID-19 through different media. Among the respondents, nearly 99% are maintaining social distancing corresponding the government's request".
Qian 2020 ²⁴	China	February	1011	"The prevalence rates of moderate or severe anxiety (score ≥ 10 on GAD-7) were 32.7% (n=167) among Wuhan participants and 20.4% (n=102) among Shanghai participants. 78.6% (n=401) of Wuhan participants and 63.9% (n=320) of Shanghai participants had carried out all six precautionary behaviors. For both measures, Wuhan participants were more responsive to the outbreak ($p < 0.001$). Controlling for personal characteristics, logistic regression results suggested that risks of moderate or severe anxiety were positively associated with perceived susceptibility (odds ratio 1.6, 95% confidence interval 1.3-1.8) and severity of the disease (1.6, 1.4-1.9) and confusion about information reliability (1.6, 1.5-1.9). Having confidence in taking measures to protect oneself against the disease was associated with a lower risk (0.6, 0.5-0.7). The strongest predictor of behavioral change was perceived severity, followed by confusion about information reliability".
Mubeen et al 2020 ²⁵	Pakistan	January-February	399	"There is lack of knowledge and awareness about coronavirus as 226 (56.6%) participants claimed that coronavirus is actually the most dangerous virus in the world, and 171 (43%) did know that the common flu virus is potentially more lethal than coronavirus. Although a large majority of participants correctly identified sources of transmission, measures and precautions to be taken for coronavirus, their knowledge for symptom identification was deficient. The most pursued platform for information for coronavirus was found to be social media, followed by television and print media"
Salman et al 2020 ²⁶	Pakistan	February - March	417	"Mean scores were 10.12 ± 2.20 for knowledge (good, moderate and poor knowledge in 50.2%, 42.8% and 7.0% of participants, respectively); 5.74 ± 1.28 for attitude (65.4% of individuals had a positive attitude); and 11.04 ± 3.34 for COVID-19 preventative practices (only 36.5% of participants had good preventive practices)."
Gallè et al 2020 ²⁷	Italy	March	2125	"A good level of knowledge about the epidemic and its control was registered in the sample, mainly among students attending life sciences degree courses. The majority of the students did not modify their diet and smoking habits, while a great part of the sample reported a decrease in physical activity"
Dkhar et	India	April	934	"A total of 934 (61%) respondents had heard details on COVID-19 from the social media, 1358 (89%) knew all ways of

al 2020 ²⁸		2020		coronavirus transmission, 602 (40%) felt that COVID-19 is a serious disease, 1184 (78%) responded that they totally agree with the lockdown decision, and 1296 (85%) responded that lockdown is helping in reducing the number of cases. The majority, i.e. 1318 (87%), followed advisories and reported washing hands with soap and water regularly, 1108 (73%) reported regularly wearing masks, 1344 (89%) reported following lockdown guidelines, and 1306 (87%) reported maintaining social distancing. The respondents exhibited good knowledge, positive attitude, and sensible practices regarding COVID-19. "
Taghrir et al 2020 ²⁹	Iran	February	240	"A total of 240 medical students completed the questionnaire. The mean age of participants was 23.67 years. The average of correct answers of knowledge was 86.96%; and 79.60% had high level of related knowledge. The average rate of practicing preventive behaviors was 94.47%; and 94.2% had high level of performance in preventive behaviors. The cumulative score of risk perception was 4.08 out of 8 which was in moderate range. Risk perception was significantly different between staggers and interns and between those being trained in emergency room (ER) and non-ER wards. There was a significant negative correlation between preventive behaviors and risk perception."
Bates et al 2020 ³⁰	Ecuador	April	2399	"A total of 2399 individuals participated. Participants had moderate to high levels of knowledge. Participants expressed mixed attitudes about the eventual control of COVID-19 in Ecuador. Participants reported high levels of adoption of preventive practices. Binomial regression analysis suggests unemployed individuals, househusbands/housewives, or manual laborers, as well as those with an elementary school education, have lower levels of knowledge. Women, people over 50 years of age, and those with higher levels of schooling were the most optimistic. Men, individuals 18–29, single, and unemployed people took the riskiest behaviors. "
Bates et al 2020 ³¹	Colombia	April	482	" A total of 482 individuals completed the questionnaire. Participants had low to moderate levels of knowledge about COVID-19. They expressed mixed levels of optimism about the world eventually controlling COVID-19, but they were very optimistic about Colombia's ability to control the disease. They reported extremely high levels of adoption of preventive practices. Binomial regression suggests few demographic factors associated with KAPs. Generally, knowledge had no association with optimism and little association with self-reported adoption of recommended practices."

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