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STUDIES

Assessment of Mental Health and Various Coping Strategies among general population living Under Imposed COVID-Lockdown Across world: A Cross-Sectional Study



Évaluation de la santé mentale et des diverses stratégies d'adaptation dans la population générale vivant sous l'emprise de la COVID à travers le monde : une étude transversal

A.S. Sameer^{a,*}, M.A. Khan^b, S. Nissar^c, M.Z. Bandy^c

^a Department of Basic Medical Sciences, College of Medicine, King Saud Bin Abdul Aziz University for Health Sciences (KSAU-HS), King Abdullah International Medical Research Centre (KAIMRC), National Guard Health Affairs (NGHA), King Abdulaziz Medical City, 21423 Jeddah, Saudi Arabia

^b Department of Medical Education, College of Medicine, King Saud Bin Abdul Aziz University for Health Sciences (KSAU-HS), King Abdullah International Medical Research Centre (KAIMRC), National Guard Health Affairs (NGHA), King Abdulaziz Medical City, 21423 Jeddah, Saudi Arabia

^c Department of Biochemistry, Government Medical College, Shri Maharaja Hari Singh Hospital, Karan Nagar, Srinagar, 190010 Kashmir, India

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KEYWORDS

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Summary The 2019 corona virus disease (COVID-19) which outbreak in December 2019, in the Chinese city of Wuhan has become a global threat and is currently the largest known outbreak of atypical pneumonia affecting every continent of the world with about 6,416,828 cases and 382,867 deaths. Disease enforced lockdowns are known to cause heightened levels of depression, anxiety, and stress. Our study aimed to investigate the immediate impact of the COVID-19 pandemic enforced lockdown on mental health and quality of life among general population

* Corresponding author.

E-mail addresses: agas@ksau-hs.edu.sa, agasy@ngha.med.sa (A.S. Sameer).

Mental Health;
Pandemic;
Psychological impact;
Stress

aged 18 years and to identify various coping strategies used under lockdown. An online survey was conducted between 1st of April–10th of May, 2020; using a validated questionnaire based on DASS-42, employing a snowball sampling technique. A total of 418 responses from 16 different countries were received. The respondents had a high level of depression and anxiety scores, which were significantly different among genders. Also, participants from developing countries—India and Pakistan had severe depression while as participants from India, Pakistan and Kingdom of Saudi Arabia had severe anxiety. We also found that among the various coping strategies, (a) watching television for entertainment, (b) social networking, (c) listening to music, (d) sleeping, (e) doing mundane house chores like cleaning, washing, etc. (f) eating well, and (g) clearing/finishing the piled-up work were ranked among the most utilized coping strategies by all participants. This study identifies the need to provide the free professional and psychological services to help cope with stress during the disease-enforced lockdown.

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MOTS CLÉS

Anxiété ;
COVID ;
DASS ;
Dépression ;
Impact
psychologique ;
Pandémie ;
Santé mentale ;
Soins de santé ;
Stress

Résumé La maladie à corona (COVID-19) qui s'est déclarée en décembre 2019 dans la ville chinoise de Wuhan est devenue une menace mondiale et constitue actuellement la plus grande épidémie connue de pneumonie atypique affectant tous les continents du monde avec environ 6 416 828 cas et 382 867 décès. On sait que les confinements imposés par la maladie provoquent des niveaux accrus de dépression, d'anxiété et de stress. Notre étude visait à étudier l'impact immédiat du confinement imposé par la pandémie de COVID-19 sur la santé mentale et la qualité de vie de la population générale âgée de 18 ans et à identifier les différentes stratégies d'adaptation utilisées dans le cadre du confinement. Une enquête en ligne a été menée entre le 1^{er} avril et le 10 mai 2020, à l'aide d'un questionnaire validé basé sur la DASS-42, en utilisant une technique d'échantillonnage en boule de neige. Au total, 418 réponses provenant de 16 pays différents ont été reçues. Les personnes interrogées présentaient un niveau élevé de dépression et d'anxiété, qui différaient sensiblement entre les sexes. En outre, les participants des pays en développement — Inde et Pakistan — souffraient de dépression grave, tandis que les participants de l'Inde, du Pakistan et du Royaume d'Arabie Saoudite souffraient d'anxiété grave. Nous avons également constaté que parmi les différentes stratégies d'adaptation, (a) regarder la télévision pour se divertir, (b) les réseaux sociaux, (c) écouter de la musique, (d) dormir, (e) faire des tâches ménagères banales comme le nettoyage, la lessive, etc. (f) bien manger, et (g) nettoyer/finir mon travail accumulé ont été classés parmi les stratégies d'adaptation les plus utilisées par tous les participants. Cette étude identifie le besoin de fournir des services professionnels et psychologiques gratuits pour aider à faire face au stress pendant le confinement imposé par la maladie.

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Introduction

The 2019 corona virus disease (COVID-19) started in December 2019, as a novel viral outbreak in seafood market in the Chinese city of Wuhan located in central Hubei province [1–3]. This novel virus quickly became a global threat by spreading across the globe within three months and is currently the largest known outbreak of atypical pneumonia since the severe acute respiratory syndrome (SARS) outbreak in 2003 affecting every continent of the world with about 6,416,828 cases and 382,867 deaths [4].

In order to prevent the spread and burden of disease, governments all over the world were forced to enforce the complete lockdown of their economies and life as we knew it came to a grinding halt [5], and several countries were

forced to implement the community mitigation strategies during this pandemic for the survival and management of distress [6,7]. Currently, an unprecedented lockdown is being enforced around the globe, in both developed as well as developing countries encompassing all continents [8]. Life under current circumstance of COVID pandemic lockdown is very challenging especially for the professionals like students, office workers and academicians and does constitute huge amounts of numerous varieties of stress [7,9]. During these unprecedented conditions, a person (especially a health care worker) is subjected to various sources of stress emanating from numerous pressures, peer pressures, personal, emotional, work or social issues, boredom, infection fear, loss of usual routine, and reduced social and physical contact, environmental factors, financial and family issues, etc. [10–12].

The current lockdown and quarantine model of fighting the COVID-19 does clearly have major social and psychological impact on the whole population. The lockdown has multi-faceted affects like unemployment, family separations, domestic violence, deaths of loved ones, failure of closure, social stigmatization, increased loneliness, work stress, the overabundance of (mis)information on social media and various other related factors. All of these serve as the major psychological risk factors for stress, anxiety, depression, and self-harm [7,11–13]. Most prevalent psychological disorders are depression and anxiety categorized as: ‘‘neurotic, stress-related and somatoform disorders’’ and ‘‘mood disorders’’. Importance of psychological and behavioral disorders in community health is well established, as they are the most significant basis of morbidity in general care settings leading to extensive disability [14,15].

There are numerous important factors causing emotional distress which have been described in the explanatory models of persons suffering from common psychological disorder. Several rating scales purporting to assess the clinical construct of depression are developed of which DASS-42 is one of the best scales to assess the levels of stress, anxiety and depression [16–19]. Several techniques and strategies have been identified by psychologists to master, reduce, tolerate, or minimize the effects of stressors. All these are referred to as coping strategies and usually include mindfulness-based stress reduction classes, wellness electives, informal support groups and mentoring programs [20]. Coping methods often used include, effective time management, social support, positive reappraisal, and engagement in leisurely [9,21,22].

Therefore, we designed this study to measure the mental stress of general populations and to assess their perceptions towards various stress factors, their sources, and their severity under the COVID lockdown.

The main aim of the study was:

- to assess the severity of depression, anxiety, and stress in general population ;
- to identify various coping strategies used under lockdown.

Methodology

This study is a descriptive type of research using survey approach. The study was carried in between 10th of April–10th of May, 2020. The online questionnaire was distributed through social media (Facebook, Twitter, WhatsApp and Official emails) by the PI and Cols to their contacts. All participants were randomly selected, and snowball sampling method was used for the inclusion. The participants were also encouraged to send the survey to their own contacts as much as possible. Participants of age equal or more than 18 years, who were able to understand English and provided their informed consent were included. The study was approved by institutional Ethic and Research Board (IRB) of King Saud bin Abdulaziz University for Health Sciences (KSAU-HS) & King Abdullah International Medical Research Center (KAIMRC).

The study was conducted among general population living in the identified lockdown cities around the world especially in countries—Kingdom of Saudi Arabia (KSA), India, Pakistan, United Kingdom (UK) and United States of America (USA). An

informed consent from all the participants was duly taken followed by the implementation of a pre-designed questionnaire based on two tools to obtain a data set composed of socio-demographic and physical characteristics.

Tool 1 was DASS-42 (Depression Anxiety Stress Scale), which is a freely available, standardized questionnaire to assess depression, stress, and anxiety. The DASS questionnaire is freely available in public domain and hence requires no permission for its use [18,19]. For this study we adopted 42-item questionnaire, which constitutes three subscales including depression, anxiety, and stress—each of which is based upon fourteen items of the DASS questionnaire. The participants respond to each item of DASS on a 4-point Likert scale (0=Did not apply to me, 1=Applied to me to some degree or some of the time, 2=Applied to me to a considerable degree or for a good part of time and 3=Applied to me very much or most of the time). According to the DASS-42 scoring algorithm, higher scores indicated higher depression, anxiety, and stress. Total score is calculated by summing the scores for each subscale. Moreover, DASS scoring manual also does provide a cut-off scores for defining the severity of depression, stress and anxiety, as provided: Normal (0–9 for depression, 0–7 for anxiety and 0–14 for stress), Mild (10–13 for depression, 8–9 for anxiety and 15–18 for stress), Moderate (14–20 for depression, 10–14 for anxiety and 19–25 for stress), Severe (21–27 for depression, 15–19 for anxiety and 26–33 for stress) and Extremely severe (> 28 for depression, > 20 for anxiety, > 34 for stress).

Tool 2 was a validated questionnaire to assess various strategies used by participants for coping the stress on a 5-point Likert scale developed from the previous published studies [22,23] (0=Strongly Disagree, 1=Disagree, 2=Unsure, 3=Agree, 4=Strongly Agree).

The data from the participants was collected via online survey using Google Forms platform. The questionnaire comprised of three sections: Section A contained questions about the demographics. Section B contained DASS 42 statements and Section C contained statements about various coping strategies. The data collected were tabulated and analysis was performed using IBM SPSS Statistics for Windows, version 20.0. Appropriate statistical tools were employed in the data analysis and variables were summarized as frequency and percentage. *P*-values less than 0.05 were accepted as statistically significant.

Results

A total of 418 participants responded voluntary to the dispensed survey, of them, 244 (58.4%) were males, while 174 (41.6%) were females. The median age of the respondents was 33.5. The average weeks spent by the participants in the lockdown was 3.65. Furthermore, 192 (45.9%) of the respondents were single and 226 (54.1%) were married. Of the respondents, 98 (23.4%) were students, 92 (22.0%) academicians, 70 (16.7%) Research Scientists, 38 (9.1%) doctors, 36 (8.6%) banking professionals, 22 (5.3%) engineers etc, 22 (5.3%) office Administrators and 10 (2.4%) house wives, 8 (1.9%) were nursing professionals. Also, participants were from 16 different countries which were under the lockdown measure during the months of March till May 2020. Major chunk of the participants was from five countries: India

Table 1 Description of participants of survey.
Description des participants à l'étude.

| | Median | Interquartile range |
|---|--------|---------------------|
| Age | 33.5 | 13 |
| How many weeks have you spent in Lock-down? | 3.0 | 1 |
| Depression Score | 16.0 | 22 |
| Anxiety Score | 16.0 | 24 |
| Stress Score | 14.0 | 21 |

Table 2 Demographic characteristics of participants.
Caractéristiques démographiques des participants.

| | <i>n</i> | % |
|--|----------|------|
| Gender | | |
| Male | 244 | 58.4 |
| Female | 174 | 41.6 |
| Marital status | | |
| Single | 192 | 45.9 |
| Married | 226 | 54.1 |
| Occupation | | |
| Student | 98 | 23.4 |
| Academician (Faculty, Teachers, etc.) | 92 | 22.0 |
| Research scientist | 70 | 16.7 |
| Doctor | 38 | 9.1 |
| Banking professionals | 36 | 8.6 |
| Engineers and allied professionals (IT, Civil, etc.) | 22 | 5.3 |
| Office administrators/Managers, etc. | 22 | 5.3 |
| Housewife/Home maker | 10 | 2.4 |
| Nursing & allied professionals | 8 | 1.9 |
| Self-employed/business owners | 6 | 1.4 |
| Marketer | 6 | 1.4 |
| Media professionals (Print & TV) | 4 | 1.0 |
| Designer | 2 | .5 |
| Unemployed | 2 | .5 |
| Hotel industry professional | 2 | 0.5 |
| Current country residence | | |
| India | 269 | 64.4 |
| Pakistan | 54 | 12.9 |
| Saudi Arabia | 27 | 6.5 |
| United Kingdom | 26 | 6.2 |
| United States of America | 14 | 3.3 |
| Canada | 6 | 1.4 |
| United Arab Emirates | 4 | 1.0 |
| Estonia | 2 | 0.5 |
| Holland | 2 | 0.5 |
| Germany | 2 | 0.5 |
| Bangladesh | 2 | 0.5 |
| Chile | 2 | 0.5 |
| Korea | 2 | 0.5 |
| Japan | 2 | 0.5 |
| Malaysia | 2 | 0.5 |
| Switzerland | 2 | 0.5 |
| Total | 418 | 100 |

(269, 64.4%), Pakistan (54, 12.9%), Saudi Arabia (27, 6.5%), United Kingdom (26, 6.2%) and United States of America (14, 3.3%). Demographic characteristics of the participants are presented in [Tables 1 and 2](#).

Analysis of DASS-42 scores (Tool 1) revealed that male and female participants differed significantly in their overall scores for depression and anxiety (P -value < 0.05) while their stress scores were almost comparable ([Table 3](#)).

Table 3 Participants perceptions of depression, anxiety, and stress on the DASS-42 scale.
Perception des participants concernant la dépression, anxiété et stress sur l'échelle DASS-42.

| Item in DASS-42 | Questions | Did not apply to me at all | Applied to me to some degree or some of the time | Applied to me to a considerable degree or a good part of time | Applied to me very much, or most of the time |
|-----------------|---|----------------------------|--|---|--|
| | <i>n</i> = 418 | <i>n</i> of <i>n</i> (%) | | | |
| | Depression Scale | | | | |
| 3 | I couldn't seem to experience any positive feelings at all | 204 (48.8) | 128 (30.6) | 50 (12.0) | 36 (8.6) |
| 5 | I just couldn't seem to get going these days | 186 (44.5) | 146 (34.9) | 56 (13.4) | 30 (7.2) |
| 10 | I feel that I have nothing to look forward to | 262 (62.7) | 96 (23) | 24 (5.7) | 36 (8.6) |
| 13 | I feel sad and depressed | 176 (42.1) | 152 (36.4) | 52 (12.4) | 38 (9.1) |
| 16 | I feel that I have lost interest in just about everything | 236 (56.5) | 124 (29.7) | 34 (8.1) | 24 (5.7) |
| 17 | I feel I am not worth much as a person | 278 (66.5) | 80 (19.1) | 36 (8.6) | 24 (5.7) |
| 21 | I feel that life isn't worthwhile (these days) | 248 (59.3) | 98 (23.4) | 46 (11.0) | 26 (6.2) |
| 24 | I can't seem to get any enjoyment out of the things I did | 180 (43.1) | 174 (41.6) | 40 (9.6) | 24 (5.7) |
| 26 | I feel down-hearted and blue | 272 (65.1) | 96 (23.0) | 28 (6.7) | 22 (5.3) |
| 31 | I am unable to become enthusiastic about anything | 220 (52.6) | 132 (31.6) | 34 (8.1) | 32 (7.7) |
| 34 | I feel that I am worthless | 296 (70.8) | 68 (16.3) | 30 (7.2) | 24 (5.7) |
| 37 | I can see nothing in the future to be hopeful about | 290 (69.4) | 88 (21.1) | 30 (7.2) | 10 (2.4) |
| 38 | I feel that life was meaningless | 312 (74.6) | 68 (16.3) | 18 (4.3) | 20 (4.8) |
| 42 | I find it difficult to work up the initiative to do things | 192 (45.9) | 132 (31.6) | 52 (12.4) | 42 (10.0) |
| | Anxiety Scale | | | | |
| 2 | I am aware of dryness of my mouth | 188 (45.0) | 108 (25.8) | 84 (20.1) | 38 (9.1) |
| 4 | I experienced breathing difficulty (e.g. breathlessness or excessively rapid breathing in the absence of physical exertion) | 320 (76.6) | 70 (16.7) | 22 (5.3) | 6 (1.4) |
| 7 | I have a feeling of shakiness (e.g. legs going to give way) | 334 (79.9) | 66 (15.8) | 8 (1.9) | 10 (2.4) |
| 9 | I find myself in situations that make me so anxious, i will be relieved when it ends | 124 (29.7) | 160 (38.3) | 88 (21.1) | 46 (11.0) |
| 15 | I have a feeling of faintness | 328 (78.5) | 62 (14.8) | 14 (3.3) | 14 (3.3) |
| 19 | I perspire noticeably (e.g. hands sweaty) in the absence of high temperatures or physical exertion | 332 (79.4) | 62 (14.8) | 14 (3.3) | 10 (2.4) |
| 20 | I feel scared (without any good reason in current time) | 250 (59.8) | 118 (28.2) | 24 (5.7) | 26 (6.2) |
| 23 | I have difficulty in swallowing | 358 (85.6) | 42 (10.0) | 12 (2.9) | 6 (1.4) |
| 25 | I am aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat) | 228 (54.5) | 110 (26.3) | 50 (12.0) | 30 (7.2) |

Table 3 (Continued)

| Item in DASS-42 | Questions | Did not apply to me at all | Applied to me to some degree or some of the time | Applied to me to a considerable degree or a good part of time | Applied to me very much, or most of the time |
|-----------------|--|----------------------------|--|---|--|
| | <i>n</i> = 418 | <i>n</i> of <i>n</i> (%) | | | |
| 28 | I feel I am close to panic | 268 (64.1) | 104 (24.9) | 26 (6.2) | 20 (4.8) |
| 30 | I fear that I would be "thrown" by some trivial but unfamiliar task | 270 (64.6) | 102 (24.4) | 24 (5.7) | 22 (5.3) |
| 36 | I feel terrified in current times | 216 (51.7) | 134 (32.1) | 42 (10.0) | 26 (6.2) |
| 40 | I am worried about situations in which I might panic and make a fool of myself | 226 (54.1) | 116 (27.8) | 44 (10.5) | 32 (7.7) |
| 41 | I experience trembling (e.g., in the hands) | 340 (81.3) | 46 (11.0) | 18 (4.3) | 14 (3.3) |
| Stress Scale | | | | | |
| 1 | I find myself getting upset by quite trivial things | 122 (29.2) | 180 (43.1) | 74 (17.7) | 42 (10.0) |
| 6 | I tend to over-react to situations | 198 (47.4) | 140 (33.5) | 48 (11.5) | 32 (7.7) |
| 8 | I find it difficult to relax | 186 (44.5) | 148 (35.4) | 50 (12.0) | 34 (8.1) |
| 11 | I find myself getting upset rather easily | 176 (42.1) | 158 (37.8) | 44 (10.5) | 40 (9.6) |
| 12 | I feel that I am using a lot of nervous energy | 180 (43.1) | 140 (33.5) | 74 (17.7) | 24 (5.7) |
| 14 | I find myself getting impatient when I am delayed in any way in simple chores (e.g. lifts, being kept waiting) | 204 (48.8) | 116 (27.8) | 66 (15.8) | 32 (7.7) |
| 18 | I feel that I am rather touchy (these days) | 210 (50.2) | 138 (33.0) | 38 (9.1) | 32 (7.7) |
| 22 | I find it hard to relax and wind down | 176 (42.1) | 158 (37.8) | 54 (12.9) | 30 (7.2) |
| 27 | I find that I am very irritable | 202 (48.3) | 132 (31.6) | 44 (10.5) | 40 (9.6) |
| 29 | I find it hard to calm down after something upsets me | 194 (46.4) | 136 (32.5) | 46 (11.0) | 42 (10.0) |
| 32 | I find it difficult to tolerate interruptions to what I am/was doing | 204 (48.8) | 122 (29.2) | 48 (11.5) | 44 (10.5) |
| 33 | I am in a state of nervous tension | 228 (54.5) | 132 (31.6) | 32 (7.7) | 26 (6.2) |
| 35 | I am intolerant of anything that kept me from getting on with what I was doing | 228 (54.5) | 132 (31.6) | 26 (6.2) | 32 (7.7) |
| 39 | I find myself getting agitated (these days) | 232 (55.5) | 114 (27.3) | 42 (10.0) | 30 (7.2) |

Furthermore, based on the severity, among male participants 54 (22.1%) had moderate, 24 (9.8%) has severe and 56 (23.0%) had extremely severe depression; while as among female participants 30 (17.2%) had moderate, 18 (10.3%) has severe and 58 (33.0%) suffered from extremely severe depression. For anxiety, among male participants 86 (35.2%) were normal but 28 (11.5%) had moderate, 26 (10.7%) has severe and 90 (36.9%) had extremely severe anxiety; while

as among female participants 48 (27.6%) were normal, 08 (4.6%) had moderate, 14 (8.0%) has severe and 94 (54.0%) suffered from extremely severe anxiety. Lastly for stress, among male participants 144 (59.0%) had normal levels of stress but 30 (12.3%) had moderate, 28 (11.5%) has severe and 22 (9.0%) had extremely severe stress; while as among female participants almost half i.e., 86 (49.4%) had normal stress levels but 20 (11.5%) had moderate, 22 (12.6%) has

Table 4 Participants perceptions on the DASS-42 scale based on gender with respect to severity ratings of depression, anxiety, and stress.
Perceptions des participants sur l'échelle DASS-42 basée sur le sexe en ce qui concerne les cotes de gravité de la dépression, de l'anxiété et du stress.

| Severity ratings | Depression category, n (%) | | Anxiety category, n (%) | | Stress category, n (%) | |
|------------------|----------------------------|-----------|-------------------------|-----------|------------------------|-----------|
| | Male | Female | Male | Female | Male | Female |
| Normal | 92 (37.7) | 48 (27.6) | 86 (35.2) | 48 (27.6) | 144 (59.0) | 86 (49.4) |
| Mild | 18 (7.4) | 20 (11.5) | 14 (5.7) | 10 (5.7) | 20 (8.2) | 22 (12.6) |
| Moderate | 54 (22.1) | 30 (17.2) | 28 (11.5) | 8 (4.6) | 30 (12.3) | 20 (11.5) |
| Severe | 24 (9.8) | 18 (10.3) | 26 (10.7) | 14 (8.0) | 28 (11.5) | 22 (12.6) |
| Extremely severe | 56 (23.0) | 58 (33.3) | 90 (36.9) | 94 (54.0) | 22 (9.0) | 24 (13.8) |

Table 5 Participants overall scores on the DASS-42 scale based on gender.
Notes globales des participants sur l'échelle DASS-42 en fonction du sexe.

| | n | Mean Rank | Mann-Whitney U | Z-value | P-value |
|------------------|-----|-----------|----------------|---------|---------|
| Depression score | | | | | |
| Male | 244 | 197.54 | 18,310 | -2.398 | .016 |
| Female | 174 | 226.27 | | | |
| Anxiety score | | | | | |
| Male | 244 | 195.34 | 17,772 | -2.840 | .005 |
| Female | 174 | 229.36 | | | |
| Stress score | | | | | |
| Male | 244 | 201.12 | 19,184 | -1.680 | .093 |
| Female | 174 | 221.25 | | | |
| Total | 418 | | | | |

severe and only 24 (13.8%) suffered from extremely severe stress (Tables 4 and 5).

Country wise, we found that there was a significant difference in the depression and stress scores ($P < 0.05$), with India having a higher mean rank and United Kingdom having lowest. Also, scores for Pakistan and Saudi Arabia were almost comparable for all three categories. Mean ranks for depression and stress for USA was second to India (Tables 6 and 7). Of all the participants, 84 (31.2%) of 269 Indians were extremely depressed, 2 (7.4%) of 27 Saudis, 14 (25.9%) of 54 Pakistanis, 4 (28.6%) of 14 of USA while as only 4 (15.4%) of 26 Britishers were extremely depressed. For anxiety, 48.3% of Indians, 37.0% of Saudis, 37.0% of Pakistanis, 28.6% of USA while as only 23.1% of 26 Britishers had extreme anxiety. For stress, 11.9% of Indians and only 3.7% of Pakistanis had extreme stress (Table 7).

Analysis of Tool 2 questionnaire revealed that there were no marked differences in using the different coping strategies by the participants in dealing with the lockdown with males and females utilizing all strategies almost comparably; however there was slight difference on the basis of professions. All the participants used the range of strategies to manage their time in quarantine in a varying degree (Table 8). Seven coping strategies (a) watching television for entertainment, (b) social networking, (c) listening to music, (d) sleeping, (e) doing mundane house chores like cleaning, washing, etc. (f) eating well, and (g) clearing/finishing my piled-up work were ranked among the most utilized coping strategies by all participants (received highest agreement) in contrast to (a) gardening/landscaping, etc., (b) watching

television for news exclusively, (c) taking up new hobby, (d) participating in online classes, etc. as the non-utilized or less useful coping strategy. Taking solace in offering prayers and participating/playing indoor sports were chosen preferentially by 38.95 of banking professional and 36.7% students to be as strongly agreeable coping strategy. Also, 53.1% of students and 31.4% of research scientists strongly agreed to use sleeping in their lockdown quarantine hours. 27.3% of Office managers and 20.4% of students strongly agreed to identifying themselves with other role models who prioritize their quality of life while 40.8% of students, 28.6% of research scientists and 26.3% of doctors strongly agreed to use respecting ones physical limits & avoiding spending many hours without sleeping. Cooking as coping strategy was strongly agreeable to 63.6% of office administrators and 44.9% students. 22.9% of doctors, 26.1% of academicians and 28.6% of students were in strong agreement to participate in online courses during the lockdown. The replies to various coping strategies by participants on the basis of 5 point Likert scale are provided in the Table 8 and Table 9. Also, Figs. 1–18 provide the graphical representation of the Likert scale scoring for various coping strategies employed by various professionals during their lockdown.

Discussion

COVID-19 is defined as the alterative form of severe acute respiratory syndrome (SARS), caused by coronavirus 2 (SARS-CoV-2) with a high possibility of transmission from animals to

Table 6 Participants overall scores on the DASS-42 scale based on country of residence.
Notes globales des participants sur l'échelle DASS-42 en fonction du pays de résidence.

| Country | n | Mean Rank | Chi ² | df | P-value |
|--------------------------|-----|-----------|------------------|----|---------|
| Depression score | | | | | |
| India | 269 | 222.71 | 11.61 | 5 | 0.041 |
| Saudi Arabia | 27 | 168.35 | | | |
| United Kingdom | 26 | 197.58 | | | |
| Pakistan | 54 | 172.91 | | | |
| United States of America | 14 | 205.79 | | | |
| Others | 28 | 205.79 | | | |
| Anxiety score | | | | | |
| India | 269 | 222.49 | 10.33 | 5 | 0.066 |
| Saudi Arabia | 27 | 178.20 | | | |
| United Kingdom | 26 | 188.88 | | | |
| Pakistan | 54 | 174.46 | | | |
| United States of America | 14 | 200.21 | | | |
| Others | 28 | 206.21 | | | |
| Stress score | | | | | |
| India | 269 | 225.02 | 15.45 | 5 | 0.009 |
| Saudi Arabia | 27 | 188.57 | | | |
| United Kingdom | 26 | 156.81 | | | |
| Pakistan | 54 | 174.02 | | | |
| United States of America | 14 | 185.07 | | | |
| Others | 28 | 210.14 | | | |
| Total | 418 | | | | |

Table 7 Participants overall scores on the DASS-42 scale based on country of residence and severity of depression, anxiety, and stress.

Score global des participants sur l'échelle DASS-42 en fonction du pays de résidence et de la gravité de la dépression, de l'anxiété et du stress.

| Severity rating | Current country residence, n (%) | | | | | |
|----------------------------|----------------------------------|--------------|----------------|--------------------------|-----------|-----------|
| | India | Saudi Arabia | United Kingdom | United States of America | Pakistan | Others |
| Depression category | | | | | | |
| Normal | 77 (28.6) | 13 (48.1) | 8 (30.8) | 6 (42.6) | 26 (48.1) | 10 (35.7) |
| Mild | 26 (9.7) | 0 (0.0) | 8 (30.8) | 0 (0.0) | 4 (7.4) | 0 (0.0) |
| Moderate | 48 (17.8) | 10 (37.0) | 6 (23.1) | 4 (28.6) | 6 (11.1) | 10 (35.7) |
| Severe | 34 (12.6) | 2 (7.4) | 0 (0.0) | 0 (0.0) | 4 (7.4) | 2 (7.1) |
| Extremely severe | 84 (31.2) | 2 (7.4) | 4 (15.4) | 4 (28.6) | 14 (25.9) | 6 (21.4) |
| Anxiety category | | | | | | |
| Normal | 75 (27.9) | 11 (40.7) | 10 (38.5) | 8 (28.6) | 24 (44.4) | 8 (28.6) |
| Mild | 14 (5.2) | 2 (7.4) | 2 (7.7) | 2 (7.1) | 4 (7.4) | 2 (7.1) |
| Moderate | 24 (8.9) | 2 (7.4) | 2 (7.7) | 4 (14.3) | 2 (3.7) | 4 (14.3) |
| Severe | 26 (9.7) | 2 (7.4) | 6 (23.1) | 0 (0.0) | 4 (7.4) | 0 (0.0) |
| Extremely severe | 130 (48.3) | 10 (37.0) | 6 (23.1) | 4 (28.6) | 20 (37.0) | 14 (50.0) |
| Stress category | | | | | | |
| Normal | 133 (49.4) | 15 (55.6) | 22 (84.6) | 10 (71.4) | 34 (63.0) | 2 (100.0) |
| Mild | 28 (10.4) | 6 (22.2) | 2 (7.7) | 0 (0.0) | 4 (7.4) | 0 (0.0) |
| Moderate | 40 (14.9) | 4 (14.8) | 0 (0.0) | 0 (0.0) | 4 (7.4) | 0 (0.0) |
| Severe | 36 (13.4) | 2 (7.4) | 0 (0.0) | 0 (0.0) | 10 (18.5) | 0 (0.0) |
| Extremely severe | 32 (11.9) | 0 (0.0) | 2 (7.7) | 4 (28.6) | 2 (3.7) | 0 (0.0) |
| Total | 269 | 27 | 26 | 14 | 54 | 28 |

humans which has been associated with contact with a local seafood vendor in Wuhan that illegally sold some wildlife animals including bats [24,25]. The initial transmission from the reservoir (usually bats) to humans involves a zoonotic

jump and then transmission between people occurs during close contact, mostly via small droplets produced by coughing, sneezing, and talking [26]. Coronaviruses, belong to the family of RNA viruses called Coronaviridae, which possess a

Table 8 Participants overall perception of the coping strategies on a five-point Likert scale.
Perception générale des participants concernant les stratégies d'adaptation sur une échelle de Likert en cinq points.

| n = 418 | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|--|-------------------|-----------|-----------|------------|----------------|
| Coping Strategies, n (%) | | | | | |
| Identifying yourself with other role models who prioritize their quality of life | 122 (29.2) | 48 (11.5) | 78 (18.7) | 98 (23.4) | 72 (17.2) |
| Respecting my physical limits, avoiding spending many hours without sleeping | 90 (21.5) | 60 (14.4) | 44 (10.5) | 110 (26.3) | 114 (27.3) |
| Cooking | 86 (20.6) | 48 (11.5) | 60 (14.4) | 124 (29.7) | 100 (23.9) |
| Eating well | 56 (13.4) | 18 (4.3) | 54 (12.9) | 158 (37.8) | 132 (31.6) |
| Reading non-medical literature/novels, etc. | 100 (23.9) | 50 (12.0) | 54 (12.9) | 120 (28.7) | 94 (22.5) |
| Listening to Music, etc. | 82 (19.6) | 42 (10.0) | 58 (13.9) | 120 (28.7) | 116 (27.8) |
| Watching television for Movies/Dramas/Sports/Religious, etc. | 88 (21.1) | 32 (7.7) | 46 (11.0) | 108 (25.8) | 144 (34.4) |
| Social networking — Facebook, Instagram, Twitter | 74 (17.7) | 30 (7.2) | 44 (10.5) | 122 (29.2) | 148 (35.4) |
| Taking solace in offering Prayers | 76 (18.2) | 32 (7.7) | 60 (14.4) | 130 (31.1) | 120 (28.7) |
| Participating/Playing Indoor Sports | 112 (26.8) | 50 (12.0) | 74 (17.7) | 86 (20.6) | 96 (23.0) |
| Sleeping | 58 (13.9) | 54 (12.9) | 60 (14.4) | 118 (28.2) | 128 (30.6) |
| Listening to Religious Videos | 106 (25.4) | 54 (12.9) | 78 (18.7) | 106 (25.4) | 74 (17.7) |
| Doing mundane house chores like cleaning, washing, etc. | 86 (20.6) | 54 (12.9) | 72 (17.2) | 110 (26.3) | 96 (23.0) |
| Clearing/Finishing my piled up work | 86 (20.6) | 42 (10.0) | 68 (16.3) | 106 (25.4) | 116 (27.8) |
| Participating in Online courses | 132 (31.6) | 46 (11.0) | 58 (13.9) | 96 (23.0) | 86 (20.6) |
| Taking up a new Hobby | 138 (33.0) | 56 (13.4) | 74 (17.7) | 80 (19.1) | 70 (16.7) |
| Gardening, Landscaping, etc. | 186 (44.5) | 62 (14.8) | 76 (18.2) | 50 (12.0) | 44 (10.5) |
| Watching television for News Exclusively | 154 (36.8) | 62 (14.8) | 60 (14.4) | 64 (15.3) | 78 (18.7) |

well-developed spherical protein envelope protecting the genetic material inside it. The envelope resembles the crown ('corona' in Latin), in its structure and hence their name and the RNA contained in them is the largest known positive-sense RNA genome in viruses [26,27].

Since the declaration of COVID-19 as the pandemic by WHO, on 11 March 2020 the disease has presented itself as an unprecedented public health crisis because of its rapid spread and higher lethality than previous pandemic/epidemics which is compounded further by the increased international travel density and immune naivety of the worldwide population [28]. This has resulted in the huge psychological impact on the mental health of the individuals living across the globe under lockdown for limiting its spread and for their own survival [6,11,12]. As all pandemics are characterized by their unique set of conditions

and control measures which affect the general population variedly on many factors like causality, progression of disease, casualties caused, mitigation strategies and control measures. With each day passing under lockdown the effects of quarantine and isolation become often intense and do adversely affect the mental well-being of a given population and in turn influencing their community behavior negatively [9]. As reported, epidemics have already been associated with a wide range of psychiatric comorbidities including anxiety, panic, depression, and trauma-related disorders [29] and this psychosocial impact has been found to be even higher during quarantine/lockdown measures [7]. Lockdown and quarantine have also been associated with high stress levels, depression, irritability, and insomnia [9,30–32].

Hence, to answer these burning questions we designed this study to attempt to evaluate the depression, anxiety

IDENTIFYING YOURSELF WITH OTHER ROLE MODELS WHO PRIORITIZE THEIR QUALITY OF LIFE

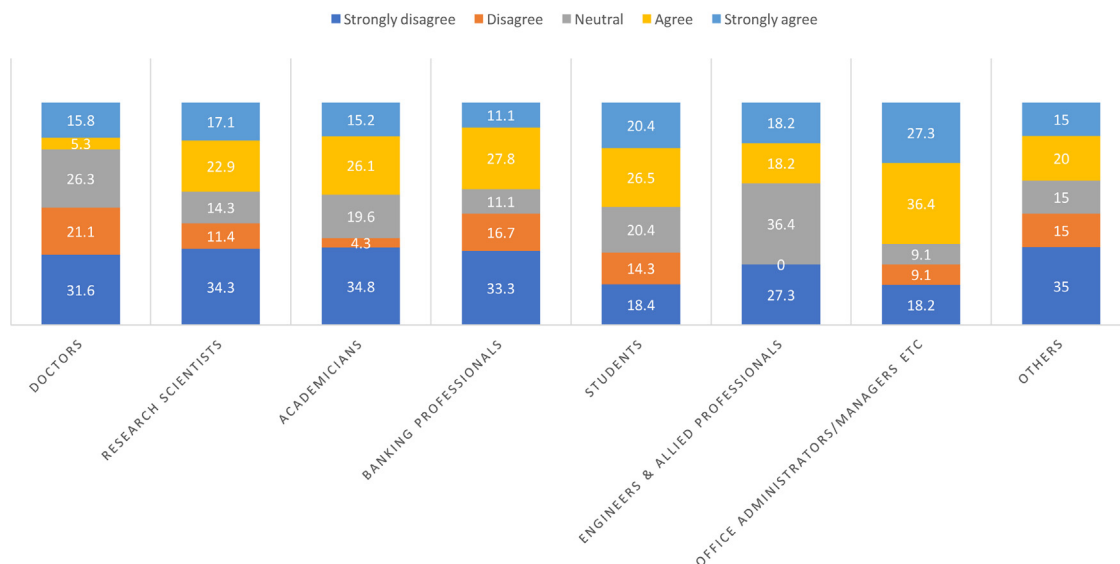


Figure 1. Identifying yourself with other role models who prioritize their quality of life.
S'identifier à d'autres modèles qui donnent la priorité à leur qualité de vie.

RESPECTING MY PHYSICAL LIMITS, AVOIDING SPENDING MANY HOURS WITHOUT SLEEPING

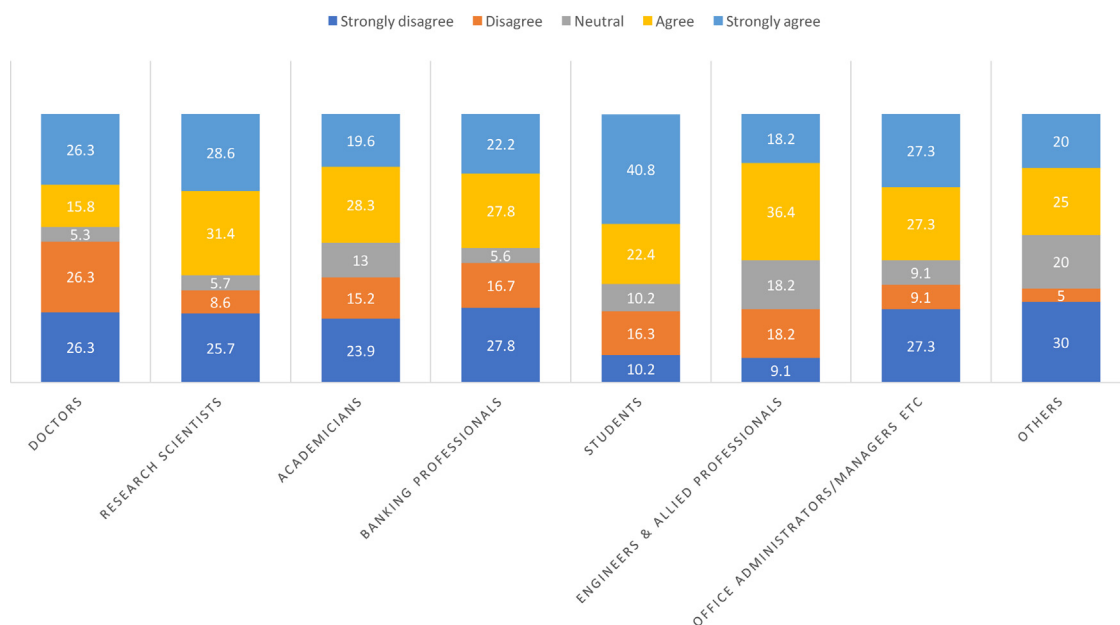


Figure 2. Respecting my physical limits, avoiding spending many hours without sleeping.
Respecter mes limites physiques, éviter de passer de nombreuses heures sans dormir.

and stress of the general people living under the COVID enforced lockdown in various cities of the world and also to understand how they are utilizing their lockdown time to cope with such an unprecedented isolation and quarantine. To the best of our knowledge, this study was among one of the first multicentric collaborative studies to investigate the immediate impact of the COVID-19 Lockdown on the mental health and coping strategies of the

general public across the world in five main cities lockdown cities.

In our current study, we found that there was a significant level of depression and anxiety in our participants and it differed in between male and females (P -value < 0.05). The results were in concordance with the earlier reports from China, India and Italy [9,11,24]. Rossi et al., in their study in Italian general population reported that

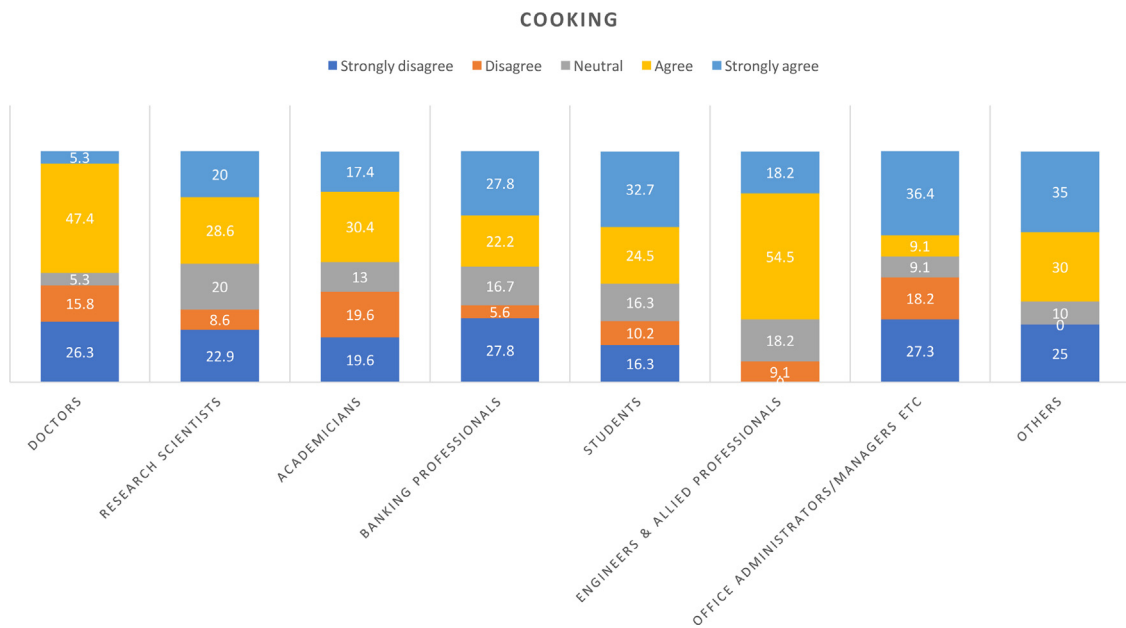


Figure 3. Cooking. Cuisiner.

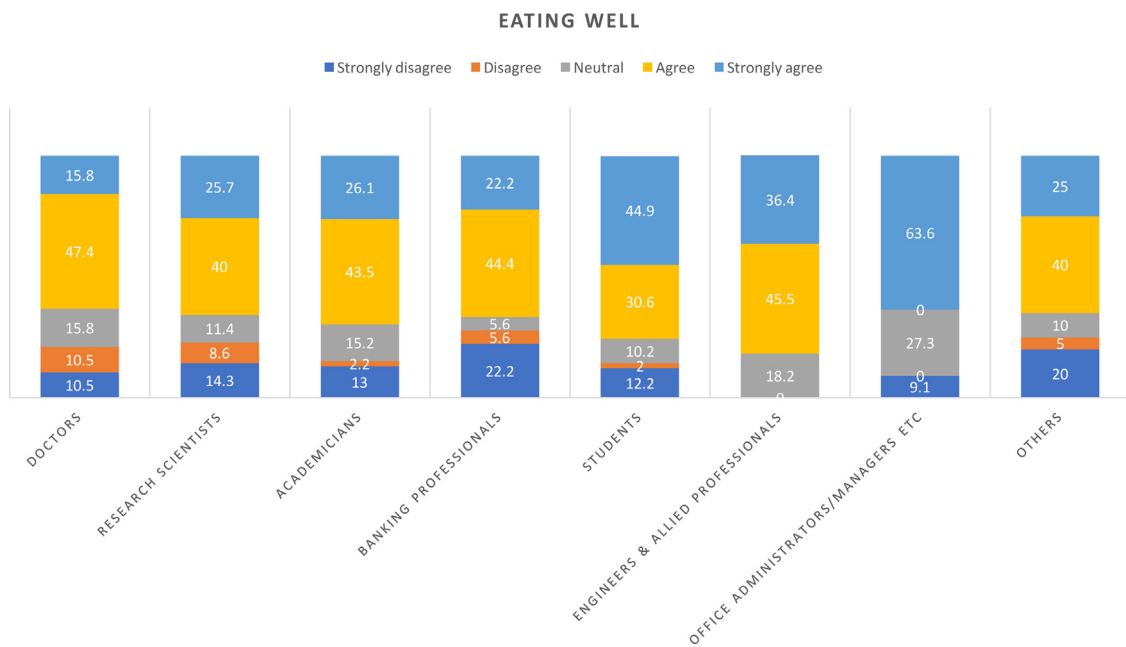


Figure 4. Eating well. Bien manger.

depression, anxiety, insomnia, high perceived stress and adjustment disorder were 37%, 17.3%, 20.8%, 7.3%, 21.8% and 22.9%, respectively among the 18,147 respondents of the survey [30]. In connection with the COVID-19 pandemic enforced lockdown, a study by Wang et al. [33], in China, with 1210 respondents found rates of 30% of anxiety and 17% of depression among participants. In another survey-based study by Qiu et al. [34], with more than 50,000 Chinese participants 35% of the participants reported trauma-related distress symptoms, with women

and young adults showing significantly higher psychological distress.

In their study, Zhang et al. [25] reported that nearly 85% of respondents reported their worries about COVID-19, and over 20% reported at least one form of mental distress in line with previous acute emergencies. Also, COVID-19 outbreak significantly reduced the young adults' sleep quality and thereby increased their global negative emotions, especially stress and anxiety. Our results also tell the similar story of increased DASS scores reflecting

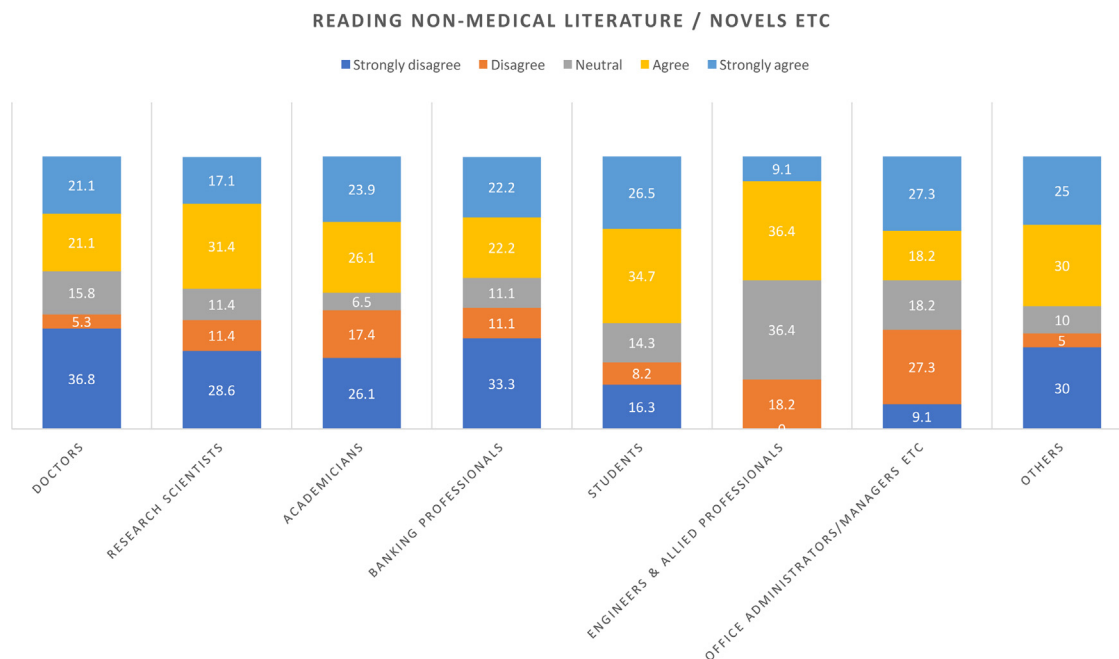


Figure 5. Reading non-medical literature, novels...
Lire de la littérature non médicale, romans...

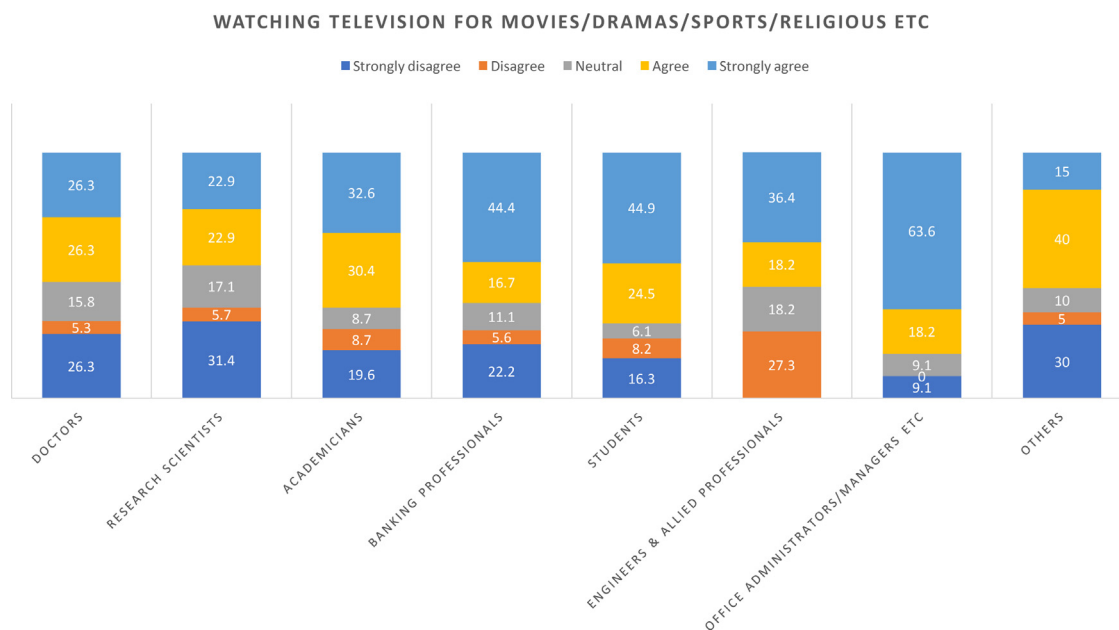


Figure 6. Watching television for Movies/Dramas/Sports/Religious...
Regarder la télévision pour des films, des pièces de théâtre, du sport, des émissions religieuses...

increased mental distress among the participants especially Indians and Pakistanis. Also, in our study majority of the participants strongly agreed to using sleep as one of the best coping strategy in the current lockdown time, which was consistent with a previous study revealing that individuals with better sleep quality showed reduced morbidity rates of post-traumatic stress disorder [25,34,35].

Furthermore, we also found that the participants used the range of strategies to manage their time in quarantine with a varying degree of agreement depending upon

their personal choices and likings. Among the top coping strategies that were used for spending time and coping the stress during the lockdown with highest levels of agreements were: (a) watching television for entertainment, (b) social networking, (c) listening to music, (d) sleeping, (e) doing mundane house chores like cleaning, washing, etc. (f) eating well, and (g) clearing/finishing my piled-up work. And among the lowest ranked coping strategies with highest levels of disagreements were: (a) Gardening & Landscaping, (b) Taking up a new Hobby, (c) Participating in Online

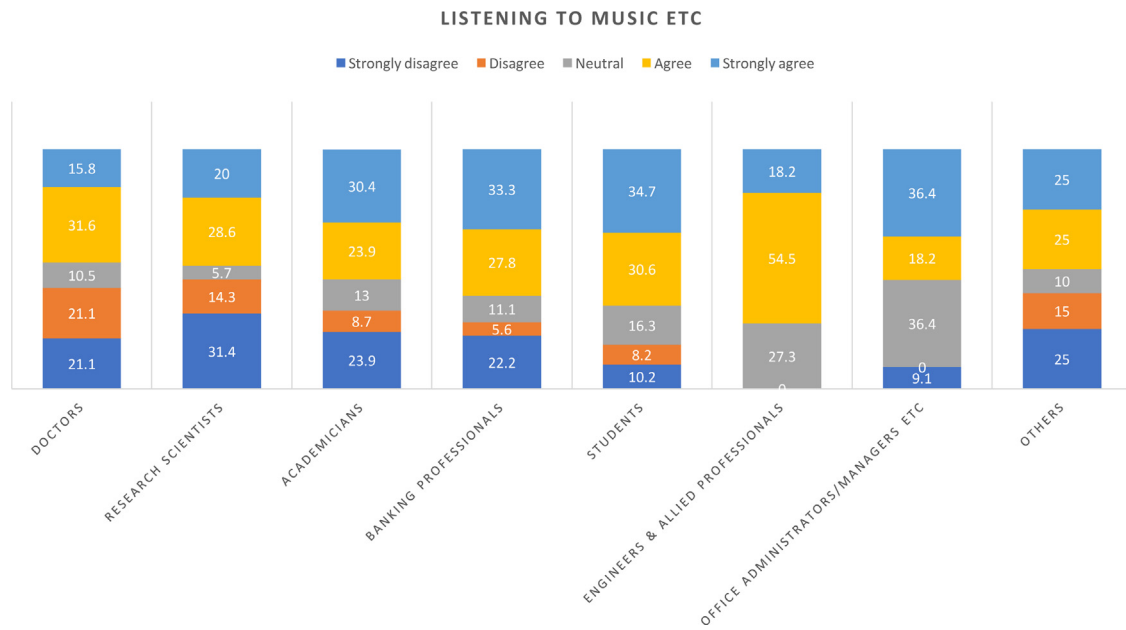


Figure 7. Listening to music. *Écouter de la musique.*

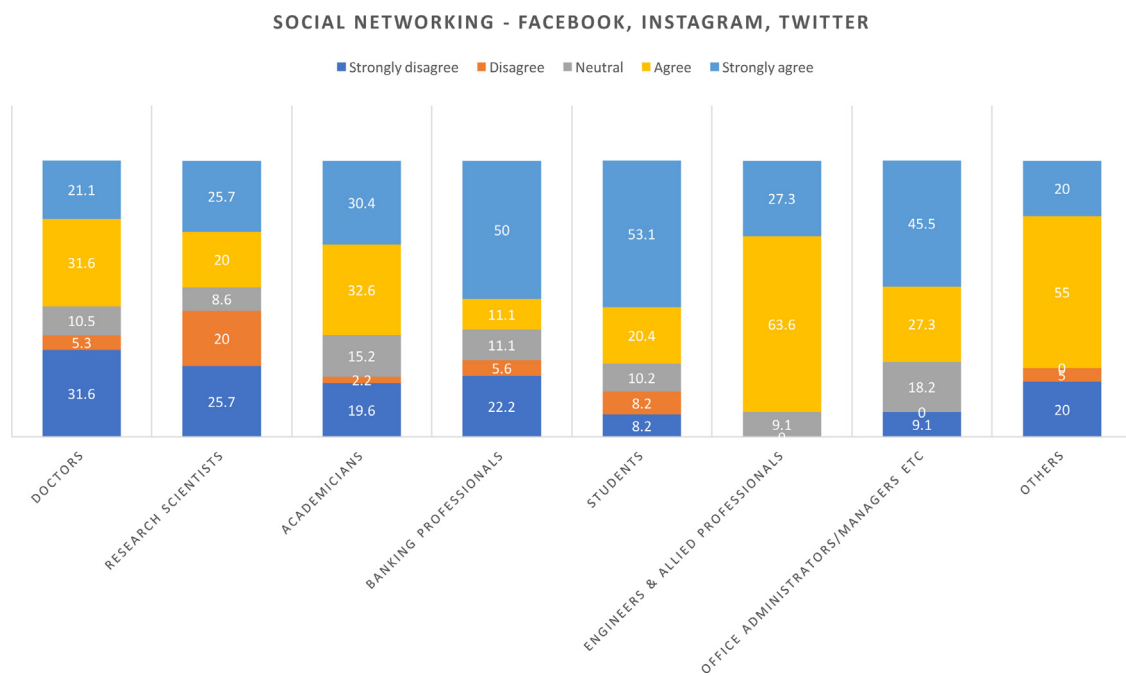


Figure 8. Social networking — Facebook, Instagram, Twitter *Réseaux sociaux — Facebook, Instagram, Twitter.*

courses, (d) Identifying yourself with other role models who prioritize their quality of life, (e) Participating/Playing Indoor Sports, and (f) Listening to Religious Videos. Ours is the first kind of study to report on the coping strategies. Please see the Figs. 1–18 and Table 8 (Supplementary Tables Also) for more in-depth information. Sleeping and eating well was utilized by most of the professionals as the strategy to cope with the stress. 63.6% of office administrators 44.9% of students, and 36.4% of engineers, etc.

strongly agreed with utilizing eating well as the strategy to be used in lockdown. Also, 53.1% of students, and 31.4% of academicians strongly agreed with proper sleeping as strategy to cope with stress. These results are in tune with the study by Zang et al. [25], in Chinese population. Also, taking solace in prayers was also regarded as coping strategy by students (40.8% = strongly agreed) and banking professionals (38.9% = strongly agreed).

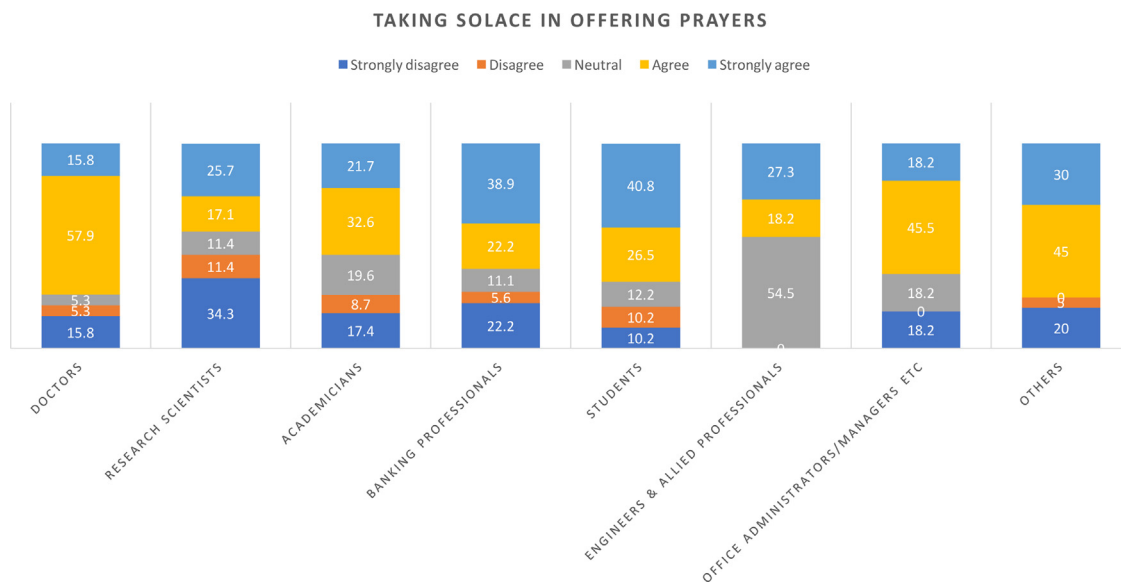


Figure 9. Taking solace in offering Prayers.
Se consoler en priant.

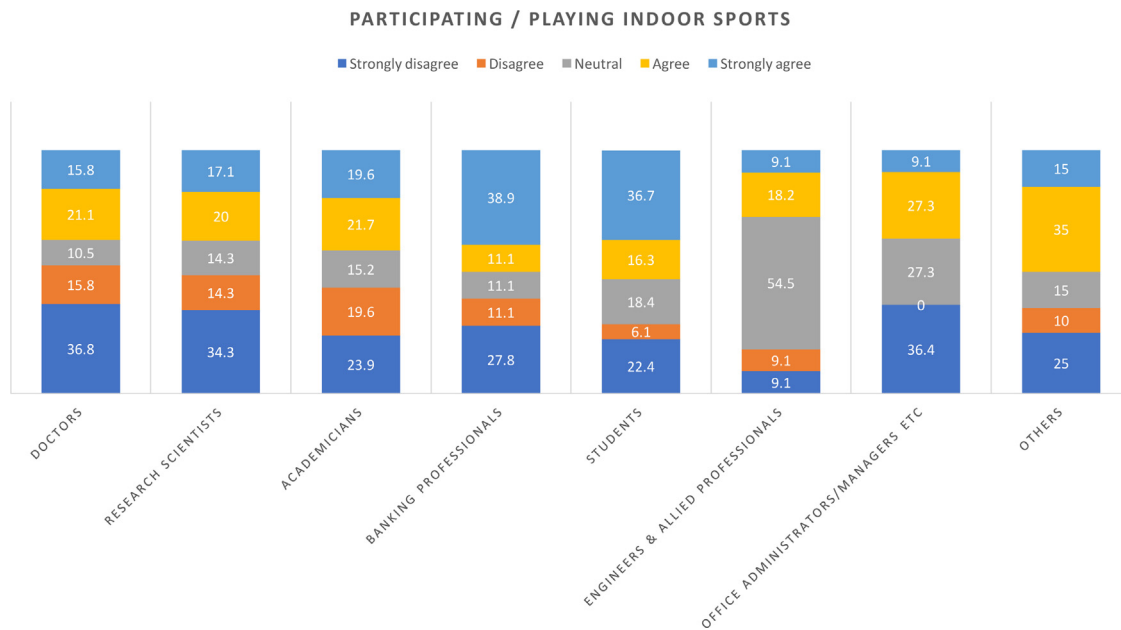


Figure 10. Participating/Playing Indoor Sports.
Participer et jouer à des sports en intérieur.

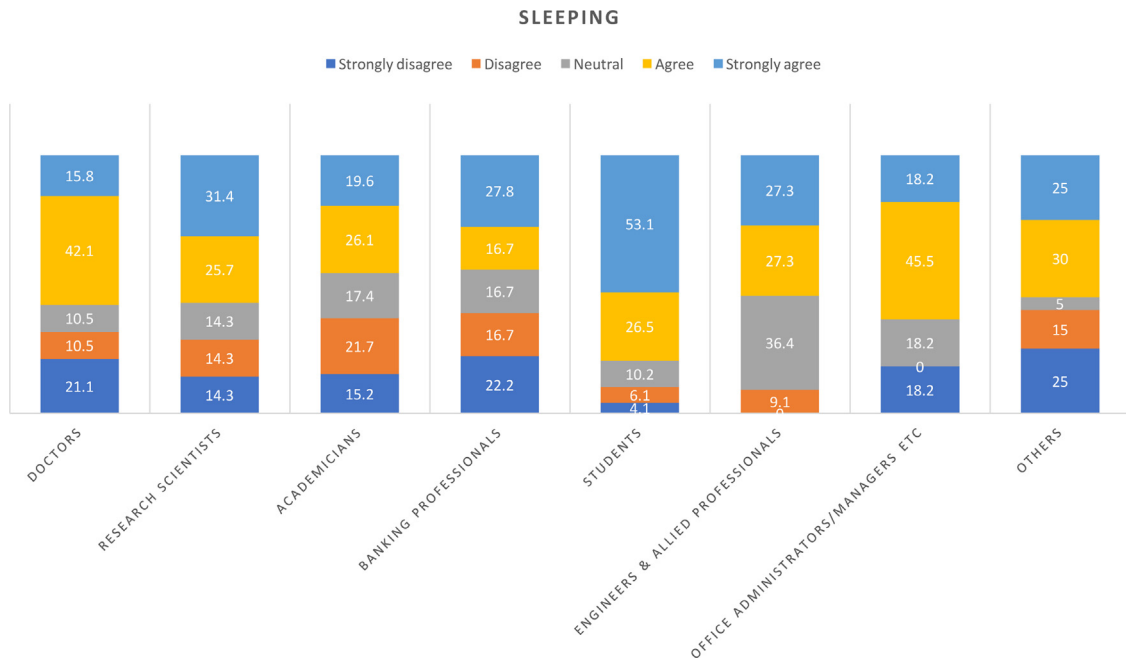


Figure 11. Sleeping.
Dormir.

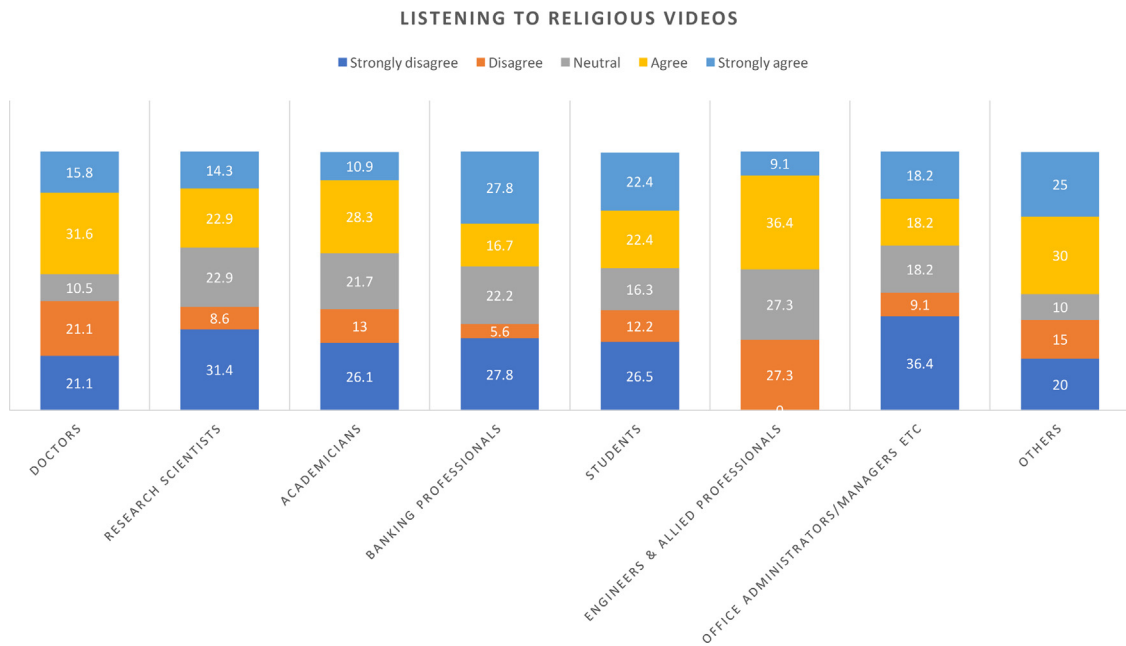


Figure 12. Listening to religious videos.
Regarder des videos religieuses.

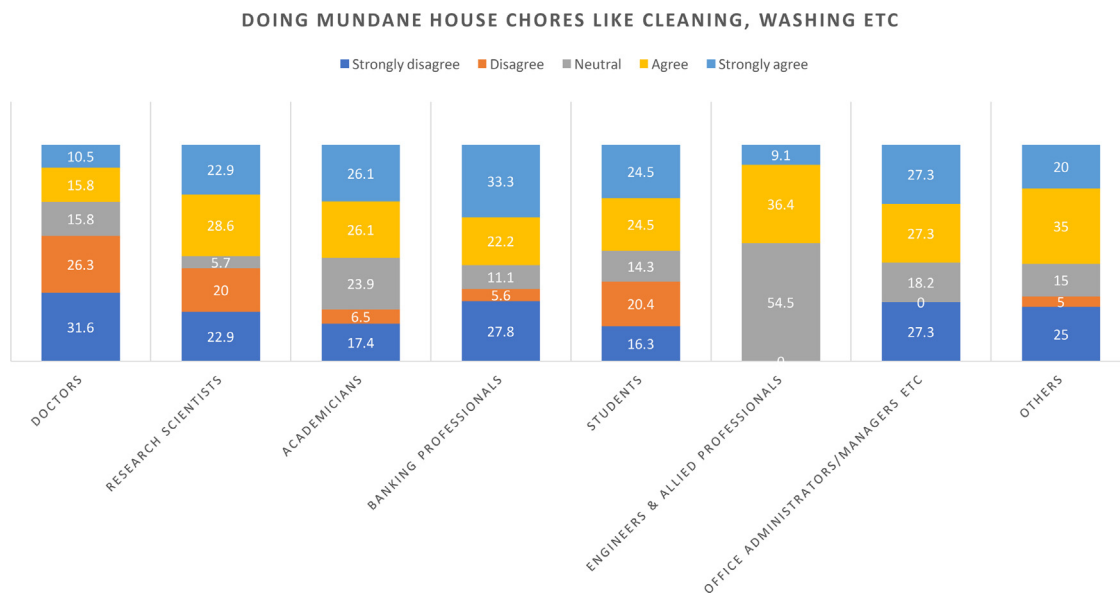


Figure 13. Doing mundane house chores like cleaning, washing...
Accomplir des tâches ménagères de base comme nettoyer, laver...

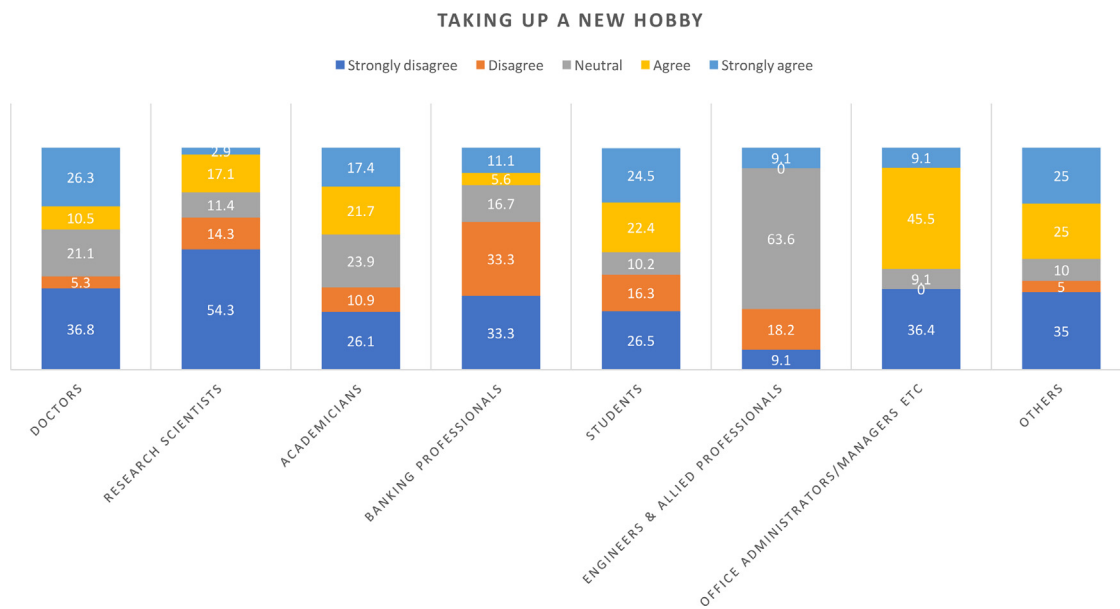


Figure 14. Taking up a new hobby.
S'adonner à un nouveau passe-temps.

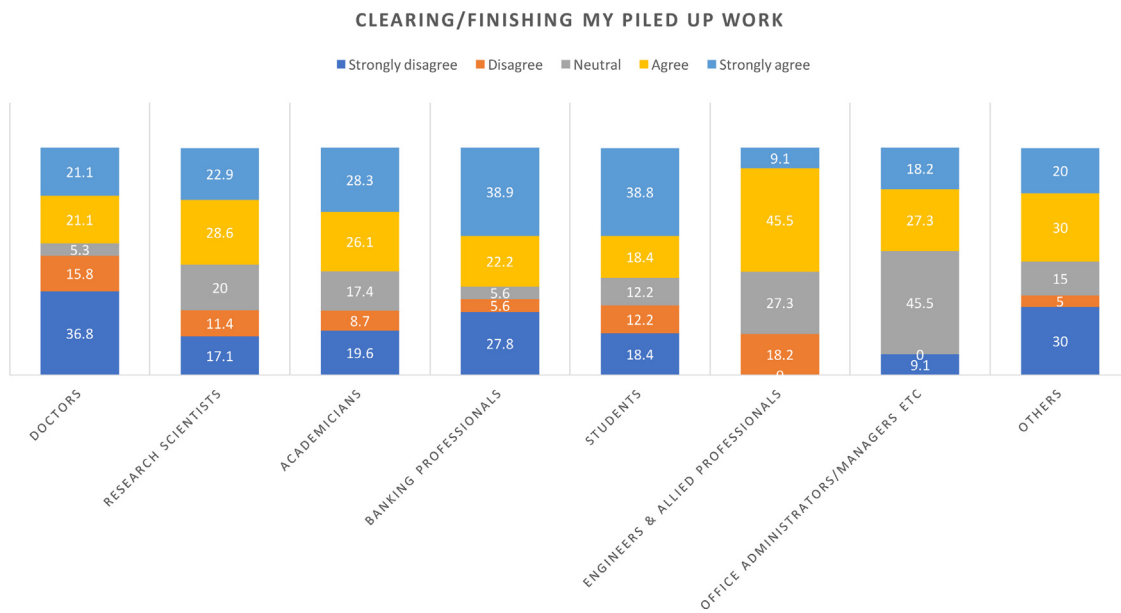


Figure 15. Clearing/Finishing my piled up work.
Déblayer/finir mon travail accumulé.

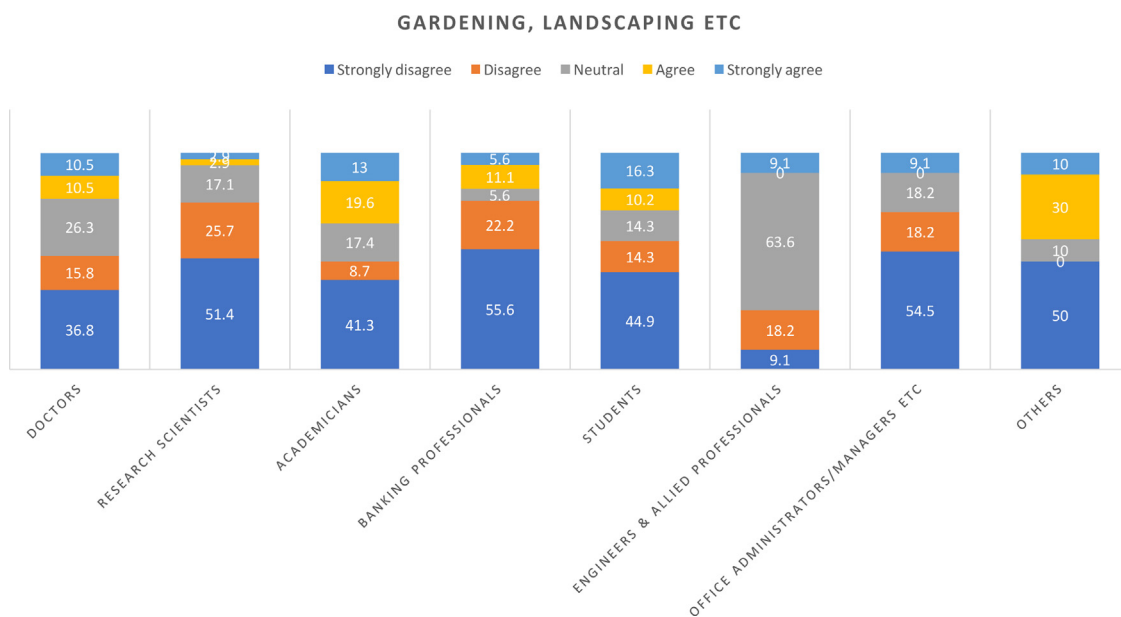


Figure 16. Gardening-landscaping.
Jardiner/faire de l'aménagement paysager.

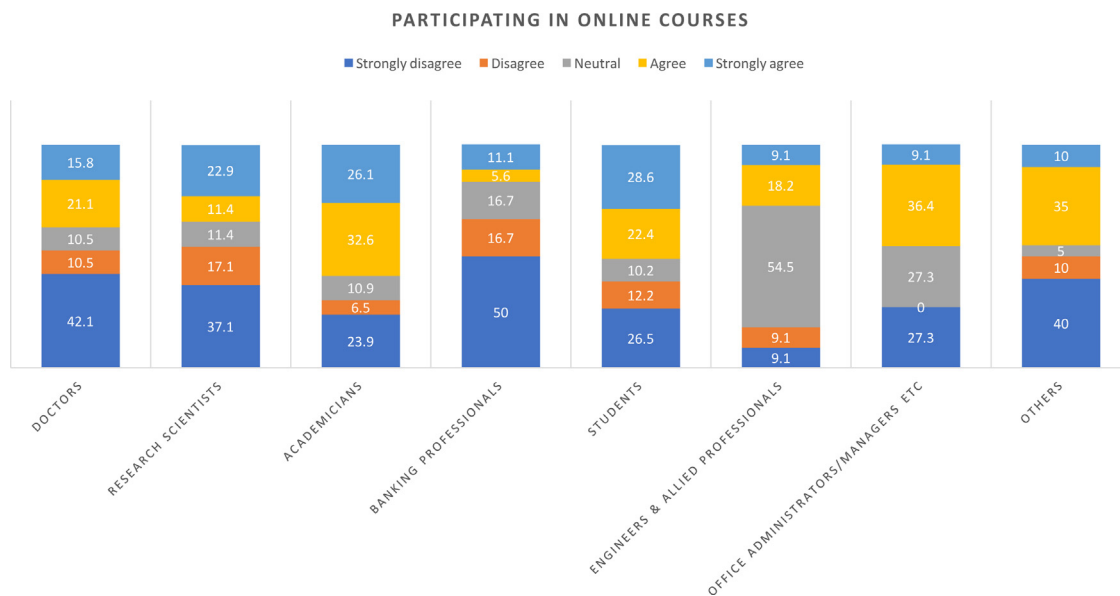


Figure 17. Participating in Online courses.
Participer à des cours en ligne.

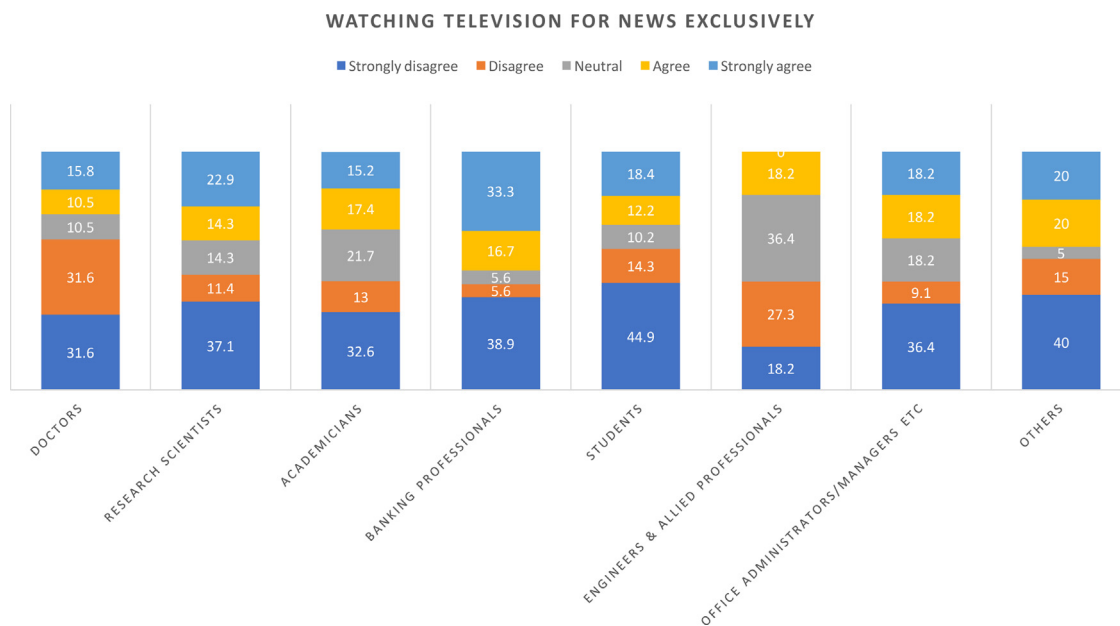


Figure 18. Watching television for News Exclusively.
Regarder uniquement les Nouvelles à la télévision.

Conclusion

The depression and stress scoring of the participants was very high especially among Indian and Pakistani nationals. Therefore, we recommend that during the lockdown and quarantine period it is imperative for the government to provide the free professional and psychological services to help cope with stress during the disease enforced lockdown and to make general people aware about the coping strategies which can be utilized to relieve the stress and make effective use of spare time.

Limitations

This is the first study that has evaluated the mental health of respondents during COVID lockdown using DASS-42 across general population. However, this study has an important limitation in sample collection as we included only the well-educated and smart phone savvy participants who are well versed with the use of social media. Also, the sample from different countries were not equal and stratified which might skew the results. Also, this was a self-reported and voluntary study that could introduce a systematic bias as well.

Ethical clearance

This study was retrospectively approved by the Institutional Review Board of King Abdullah International Medical Research Centre (KAIMRC), a research wing of KSAU-HS, Jeddah (Reference No. RJ20/067/J; Dated: 22/04/2020).

Author contributions

S.S.A. conceptualized the project, designed the study questionnaire in its final form, analyzed the collected data and wrote the entire manuscript.

M.A.K. helped in the data collection and did the statistical analysis of the collected data and made sense of it.

S.S.N. helped in data collection, proof reading, revising, and drafting of tables & figures of the final version of manuscript.

M.Z.B. helped in data collection, proof reading, revising of the final version of manuscript.

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Disclosure of interest

The authors declare that they have no competing interest.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at <https://doi.org/10.1016/j.jemep.2020.100571>.

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