Title: Influence of Physical Activity on Psychological Responses during Coronavirus Disease (COVID-19) Pandemic: a multi-center and observational study

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Brief Summary

The on-going Wuhan coronavirus (COVID-19) outbreak has become the world's leading health headline and is causing major panic and public concerns. On January 30, 2020, the World Health Organization (WHO) declared that the new coronavirus outbreak as a Public Health Emergency of International Concern; and March 11, 2020, characterized COVID-19 as a pandemic. On March, 13, Europe become epicenter of the pandemic all countries in South America had been infected with at least one case (World Health Organization, n.d.-b).

Health authorities, including WHO (World Health Organization, n.d.-a), have issued safety recommendations for taking simple precautions to reduce exposure to and transmission of the virus. Home stay is a fundamental safety step that can limit infections from spreading widely. Unfortunately, the mandated directives against travelling and participating in outdoor activities will inevitably disrupt the routine daily activities of tens of millions of people (Chen et al., 2020). Prolonged home stays may lead to widespread fear and panic, anxiety and depression (J. Zhang, Wu, Zhao, & Zhang, 2020), which in turn can lead to a sedentary lifestyle. Thus, while quarantine is a safe and priority measure, may have unintended negative consequences (Wang et al., 2020; J. Zhang et al., 2020). These efforts to avoid human-to-human transmission of the virus may lead to spend excessive amounts of time sitting, reclining or lying down for screening activities (games, television, mobile devices); reducing energy expenditure that, consequently, lead to an increased in a range of chronic health conditions (Owen, Sparling, Healy, Dunstan, & Matthews, 2010). Therefore, there is a strong health rationale for continuing physical activity in the home to stay healthy and prevent a wide range of psychological problems on people during outbreaks of infection (Chen et al., 2020).

However, currently, there is no sufficient information on the psychological impact and mental health of the general public during the peak of the COVID-19 epidemic and a timely understanding of mental health status is urgently needed for society (Xiang et al., 2020). To our knowledge, there are no research examining the psychological and social impact on COVID-19 on the general population. The aim of this research is to determinate the psychological responses in general population in order to understand the anxiety, depression and stress level during Coronavirus Disease (COVID-19) confinement period, and how the level of physical activity development during this exceptional period could be influence.

Methods

Setting and Participants

We will adopt a cross-sectional survey design to assess the public's immediate psychological and level of physical activity response during the epidemic of COVID-19 by using an anonymous online questionnaire. A snowball sampling strategy, focus on recruiting the general public living in main Spain and Latin America countries during the epidemic of COVID-19, will be utilized. The online survey will be first disseminated to contacts and they will be encouraged to pass it on to others.

Procedure

As the Governments recommended the public to minimize face-to-face interaction and isolate themselves at home, potential respondents will be electronically invited by existing study respondents. They will complete the questionnaires in Spanish through an online survey platform (Google Forms). Information about this study was posted on a dedicated website. All respondents will be provided informed consent. Data collection will take place over confinement period and 3 previous days to the finish the after the WHO declared the COVID-19 outbreak as a public health emergency of international concern.

Outcome Measures

Previous surveys on the psychological impacts of SARS and influenza outbreaks were reviewed (Wang et al., 2020). The structured questionnaire consists of questions that covered several areas: (1) demographic data; (2) physical symptoms in the past 14 days; (3) contact history with COVID-19 in the past 14 days; (4) the psychological impact of the COVID-19 outbreak; (5) mental health status; and (6) level of physical activity.

Sociodemographic data will be collected on gender, age, education, residential location days, marital status, employment status, monthly income, parental status, and household size. Physical symptom variables in the past 14 days included fever, chills, headache, myalgia, cough, difficulty in breathing, dizziness, coryza, sore throat, and persistent fever, as well as persistent fever and cough or difficulty breathing. Health service utilization variables in the past 14 days will include consultation with a doctor in the clinic, admission to the hospital, being quarantined by a health authority, and being tested for COVID-19. Contact history variables will include close contact with an individual with confirmed COVID-19, indirect contact with an individual with confirmed COVID-19, and contact with an individual with suspected COVID-19 or infected materials.

The psychological impact of COVID-19 will be measured using the Impact of Event Scale-Revised (IES-R). The IES-R is a self-administered questionnaire that has been well-validated in the Spanish population for determining the extent of psychological impact after exposure to a public health crisis within one week of exposure (Villafañe, Milanesio, Marcellino, & Amodei, 2003). This 22-item questionnaire is composed of three subscales and aims to measure the mean avoidance, intrusion, and hyperarousal (M. W. B. Zhang, Ho, Fang, Lu, & Ho, 2014). The total IES-R score will be divided into 0–23 (normal), 24–32 (mild psychological impact), 33–36 (moderate psychological impact), and >37 (severe psychological impact) (Creamer, Bell, & Failla, 2003).

Mental health status will be measured using the Depression, Anxiety and Stress Scale (DASS-21) and calculations of scores will be based on the previous study (Wang et al., 2020). Questions 3, 5, 10, 13, 16, 17 and 21 will form the depression subscale. The total depression subscale score will be divided into normal (0–9), mild depression (10–12), moderate depression (13–20), severe depression (21–27), and extremely severe depression (28–42). Questions 2, 4, 7, 9, 15, 19, and 20 will form the anxiety subscale. The total anxiety subscale score will be divided into normal (0–6), mild anxiety (7–9), moderate anxiety (10–14), severe anxiety (15–19), and extremely severe anxiety (20–42). Questions 1, 6, 8, 11, 12, 14, and 18 will form the stress subscale. The total stress subscale score will be divided into normal (0–10), mild stress (11–18), moderate stress (19–26), severe stress (27–34), and extremely severe stress (35–42). The DASS has been demonstrated to be a reliable and valid measure in assessing mental health in the

Spanish population (Bados, Solanas, & Andrés, 2005; Daza, Novy, Stanley, & Averill, 2002). The DASS was previously used in research related to SARS (Wang et al., 2020).

The IPAQ short form will be used to measure physical activity level. Total physical activity metabolic equivalent of task (MET)-minutes/ week will be calculated through the following formula: sum of walking + moderate + vigorous MET-minutes/week scores (Ipaq, 2005). Using guidelines for data processing and analysis of the IPAQ, participants will be divided into those who are (≥600 MET-minutes/week) and those who are not (<600 MET-minutes/week) sufficiently active. The IPAQ has been validated in adult populations from different countries showing acceptable validity (Spearman's ρ = 0.30, 95% CI: 0.23–0.36) and reliability (Spearman's ρ = 0.81, 95% CI: 0.79–0.82).(Craig et al., 2003)

Statistical Analysis Plan (SAP)

Descriptive statistics will be calculated for sociodemographic characteristics, physical symptoms and health service utilization variables, and additional health information variables. Percentages of response will be calculated according to the number of respondents per response with respect to the number of total responses of a question. The scores of the IES-R and DASS subscales will be expressed as mean and standard deviation. We will be linear regressions to calculate the univariate associations between sociodemographic characteristics, physical symptom and health service utilization variables, contact history variables, additional health information variables, and the IES-S score as well as the subscales of the DASS and level of physical activity. All tests will be two-tailed, with a significance level of $p < 0.05$. Statistical analysis will be performed using SPSS Statistic 21.0 (IBM SPSS Statistics, New York, United States).

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