

# Detrimental Effects of COVID-19 on Physical and Mental Health in Pakistan

Shifa Abbasi<sup>1</sup>, Zara Abbasi<sup>2</sup>, Muhammad Hassan Waseem<sup>3</sup>, Syed Murtaza Ali<sup>4</sup>, Aqsa Sajjad<sup>1,\*</sup>, Muddasir Ansari<sup>3</sup>

<sup>1</sup>Physiotherapy Department, Agha Khan University Hospital, Karachi, Pakistan

<sup>2</sup>Physical Therapy Department, Liaquat University of Medical and Health Sciences, Jamshoro, Pakistan

<sup>3</sup>Karachi Institute of Physical Therapy and Rehabilitation Sciences, Karachi, Pakistan

<sup>4</sup>Institute of Physical Therapy and Rehabilitation Sciences, Peoples University of Medical and Health Sciences, Nawabshah, Pakistan

## Email address:

aqsasajjad23@live.com (A. Sajjad)

\*Corresponding author

## To cite this article:

Shifa Abbasi, Zara Abbasi, Muhammad Hassan Waseem, Syed Murtaza Ali, Aqsa Sajjad, Muddasir Ansari. Detrimental Effects of COVID-19 on Physical and Mental Health in Pakistan. *International Journal of Infectious Diseases and Therapy*. Vol. 6, No. 4, 2021, pp. 126-131. doi: 10.11648/j.ijidt.20210604.12

Received: August 25, 2021; Accepted: September 9, 2021; Published: October 12, 2021

**Abstract:** Background: The novel COVID-19 first reported in Wuhan, China then rapidly spread via contact and droplet means and stated as a pandemic. Pakistan was predicted as the next epicenter of the pandemic and WHO Operational Planning Guidelines and country preparedness and response was implemented in the country. Physical and mental crisis were evident in previous pandemics so as in COVID-19. Material and Methods: This is an observatory study in which sample 385 was selected without randomization from all over Pakistan during the pandemic. Participant were smart phone users with the age limit between 13 to 17 years old. Data was collected via Google survey and was analyzed by SPSS. Results: The participants belong to different occupations with a mean age of  $28 \pm 10.85$ . The trinity of questionnaire of general health, death anxiety and anxiety shows COVID have effects on physical and mental health with a significant value of 0.001. Conclusion: This study shows that COVID-19 has effects on mental and physical health and also increased death anxiety in overall population either they had COVID by their selves or by their beloved ones and effects of COVID were seen that physical and mental health both are at stack reveals increased anxiety, stress and negative thoughts, financial difficulties engaging people in harmful behavior.

**Keywords:** Corona Virus, Mental Health, Physical Health, Pakistan, Pandemic

## 1. Introduction

Severe pneumonia, 425 cases were firstly reported at Wuhan, Hubei, China in December 2019 [1]. In January 2020, WHO declared COVID-19 as Public Health Emergency of International Concern [2]. After H1N1 Influenza (2009), Polio (2014), Ebola in West Africa (2014), Zika (2016), Ebola in DRC (2019), while experts at WHO pay serious concern about Pakistan being the next epicenter of this pandemic after China [2-5]. In February 2020, this virus was named as the Novel Corona Virus Disease (nCOVID-19) by World Health Organization (WHO) [6]. COVID-19 spread via human to human transmission by droplet means, later in March 2020, it was stated as pandemic by WHO [3-7]. Because COVID-19

spreads more rapidly than Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS) [8].

Beta coronavirus is the causative agent of COVID-19 [8], typical chest computerized tomography findings are multifocal bilateral ground glass opacity with patchy consolidation, along with prominent plural periphery alteration [9].

On 26<sup>th</sup> February 2020, two cases of COVID-19 were reported in Pakistan, having a travel history from Iran [10-13]. WHO Operational Planning Guidelines and country preparedness and response were implemented in Pakistan [4, 5]. In addition to marked increase in mortality rate in the month of April, also triggers anxiety [4, 14, 15]. Though death anxiety is rarely observed whereas fear of suffering from dying process does possess for that Donald Templer in 1970

developed Death Anxiety (Thanatophobia) Scale was used [16, 17]. Anxiety and depression are seen in so many people because of this novel COVID-19 that is mainly because of the safety precaution taken by means of lockdown to minimize the socializing events, though this leads to self-destructive action such as raise in aggression, negative thoughts, and suicidal thoughts and are exacerbated in response of poverty, obesity and other comorbidities [18, 19]. Social isolation and lockdown circumstances have great psychological impact which encompasses stress, fear, depression, anxiety of being sick, death anxiety and concern about the health of their dear ones which enhance the sense of helplessness, hopelessness and negative thoughts and emotions resulting in deterioration of physical, mental and emotional wellbeing of the whole population either are effected by the disease or not [4, 20, 21]. To encounter these kind of impact community based physical activity and many more positive activities which has greater impact on mental health can be helpful [18].

Studies show presence of death anxiety in elderly, on other hand children have fear of death but for their parents [17]. Medical professional and nurses they are most likely to be exposed to such traumatic situations encountering death, breaking bad news to someone's family, having close incite and giving care to ones those are suffering and have a great influence on their lives and get them into death anxiety in every possible ways [22]. Thanatophobia is commonly seen in the era of pandemics in every age group and every profession [22]. Psychological effects of COVID-19 is evident in China and UK [22]. Death anxiety can be prevalent with emotional and psychological consequences [22]. Moreover, death anxiety lowers self-esteem and end up with developing depression that may result in self-harm and suicidal thoughts [22].

Moreover the implement of nationwide confinement, to hinder the spread of pandemic also results in cessation of physical activity [20-25]. Evidence has shown that both physical and mental effects of pandemic triggers each other though physical activity and mental illness are inversely proportional [19]. Sudden period of quarantine may cause risk of cardiac problem or deterioration of cardiac health following lack of physical activity [19-25].

Many latest researches are done on deleterious effects of physical inactivity on cardiovascular health that shows this tenure may lead to vascular changes such as narrowing of peripheral vessels, arterial stiffening [19-25]. Whereas cardiac changes like reduced rate of cardiac perfusion and cardiac atrophy may occur [19-25]. In addition to these, certain inactivity-induced alterations, such as muscle wasting, increased visceral fat, hyperglycemia, and dyslipidemia may occur [25].

It is evident especially in those who are either effected by corona virus or someone from their social circle. News bulletins regarding rapid spread of COVID-19, raising number of affected people effect physically and mentally health. It will be beneficial for a developing country like Pakistan who had been going through multiple crisis and is trying to cater health related issues like COVID-19, premature deaths, sudden cardiac issues, silent killer hypertension, birth deformities, diabetes mellitus, malnutrition, eclampsia and many more, to follow some coping strategies for healthy nation.

## 2. Methods and Material

This descriptive observational study conducted in Pakistan on physical and mental health during the lockdown situation following the precautionary measures against the spread of COVID-19.

### 2.1. Study Conduct and Data Collection

Data was collected by means of online Google survey within a tenure of two months, i.e.: from 13<sup>th</sup> May to 13<sup>th</sup> July, 2020. Survey was disseminated via all social media networks to Karachi, Quetta, Islamabad and Hyderabad to obtain data from distant areas of Pakistan. Population of Pakistan is estimated around 21 Billion and the sample size of 385 was calculated by Rao soft, accordingly. Non probability Convenience sampling technique was used. A trinity of questionnaires used in this research were relevant to general health, stress and death anxiety, namely General health status questionnaire, Anxiety scale and Templers death anxiety scale, respectively.

### 2.2. Statistical Analysis

Data was analyzed by Google drive/ data analysis was done by SPSS version 22 showing frequency and percentages of categorical variables and mean standard deviation of continuous variable. Participants included were English literate who can read, understand and fill the Survey. This online survey substantially reduces biasness of misinterpretation of results because it provides a well analyzed data, even though it also reduces respondent and interviewer biasness.

## 3. Results

The sample of 385 participants from Pakistan were studied in this study. Participants were having different occupations including Teachers, Dentist, Doctors, Physiotherapist, Governments Servants, Banker, Engineers, Architects, some were retired officers and others were students, interns, house officers whereas few were unemployed. There were a variety of age groups, encompasses teen agers, adolescents, young adults, adults and elder adults though age of participants were between 13 to 70, the mean average age was 28±10.85, as shown below in table 1.

**Table 1.** Tabular presentation of average age of participants.

Average age of participants	
N	385
Mean	28.86
Std. Deviation	10.85

Limitations in moderate activity in this pandemic period shows 42% participate reported "Not at all", 25% participate reported "a little bit", 23% participate reported "Sometimes" and 10% participate reported "A lot". Limitations in high intensity activity during lockdown shows 32% participate reported "Not at all", 34% participate reported "a little bit", 21% participate reported "Sometimes" and 13% participate reported "A lot". Problems encountered with work or daily activities as the result of physical

health during COVID-19 shows 32% participate reported “Not at all”, 28% participate reported “a little bit”, 26% participate reported “Sometimes” and 13% participate reported “A lot”. Problems encountered with work or daily activities as the result of emotional problems during COVID-19 shows 39% participate reported “Not at all”, 28% participate reported “a little bit”, 14% participate reported “Sometimes” and 19% participate reported “A lot”. Pain interference in work during COVID-19 shows 40% participate reported “Not at all”, 32% participate reported “a little bit”, 18% participate reported “Sometimes” and 10% participate reported “A lot”. Regarding peaceful feeling shows 42%

participate reported “Not at all”, 27% participate reported “a little bit”, 7% participate reported “Sometimes” and 24% participate reported “A lot”. Regarding feeling downhearted shows 42% participate reported “Not at all”, 27% participate reported “a little bit”, 19% participate reported “Sometimes” and 12% participate reported “A lot”. Interference in social activities shows 26% participate reported “Not at all”, 34% participate reported “a little bit”, 20% participate reported “Sometimes” and 20% participate reported “A lot”. All the above reported results are presented in tabular form in table 2.

**Table 2.** Tabular presentation of general health during COVID-19.

General health during COVID-19	A lot	Sometimes	a little bit	Not at all	P-Value
Limitations in moderate activities	10%	23%	25%	42%	< 0.001
Limitation in high intensity activities	13%	21%	34%	32%	< 0.001
Limitations in daily activities as a result of physical health	13%	26%	28%	32%	< 0.001
Limitations in daily activities as a result of emotional problems	19%	14%	28%	39%	< 0.001
Pain inference in work	10%	18%	32%	40%	< 0.001
Have you felt calm and peaceful, during past 4 weeks	24%	7%	27%	42%	< 0.001
Have you felt downhearted and blue, during past 4 weeks	12%	19%	27%	42%	< 0.001
Mental and physical health interfered with social activities	20%	20%	34%	26%	< 0.001

The question regarding fear of cancer/COVID-19 shows 40% participate reported “Not at all”, 22% participate reported “a little bit”, 19% participate reported “Sometimes” and 19% participate reported “A lot”. Regarding fear of dying of painful death shows 13% participate reported “Not at all”, 11% participate reported “a little bit”, 18% participate reported “Sometimes” and 58%

participate reported “A lot”. Trouble/anxiety with the subject of life after death shows 46% participate reported “Not at all”, 23% participate reported “a little bit”, 14% participate reported “Sometimes” and 17% participate reported “A lot”. The above reported results are presented in tabular form in table 3.

**Table 3.** Tabular presentation of death anxiety during COVID-19.

Death anxiety during COVID-19	A lot	Sometimes	a little bit	Not at all	P-Value
Fear of death	25%	19%	17%	39%	< 0.001
Afraid of dying with Cancer or COVID	19%	19%	22%	40%	< 0.001
Fear of dying of painful death	58%	18%	11%	13%	< 0.001
Afraid of life after death	17%	14%	23%	46%	< 0.001

Participants have been nervous and anxious shows 41% participate reported “Not at all”, 28% participate reported “a little bit”, 12% participate reported “Sometimes” and 19% participate reported “A lot”. The question regarding difficulty to stop or control worrying shows 40% participate reported “Not at all”, 32% participate reported “a little bit”, 13% participate reported “Sometimes” and 15% participate reported “A lot”. Regarding worrying about different things shows 37% participate reported “Not at all”, 31% participate reported “a little bit”, 9% participate reported “Sometimes” and 23% participate reported “A lot”. Trouble relaxing shows 40% participate reported “Not at all”, 28% participate reported “a little bit”, 14% participate reported “Sometimes”

and 18% participate reported “A lot”. The question regarding restlessness shows 37% participate reported “Not at all”, 24% participate reported “a little bit”, 22% participate reported “Sometimes” and 17% participate reported “A lot”. Being easily annoyed or irritable shows 38% participate reported “Not at all”, 30% participate reported “a little bit”, 8% participate reported “Sometimes” and 24% participate reported “A lot”. Afraid of something awful might happen shows 38% participate reported “Not at all”, 23% participate reported “a little bit”, 15% participate reported “Sometimes” and 24% participate reported “A lot”. The above reported results are presented in tabular form in table 4.

**Table 4.** Tabular presentation of anxiety during COVID-19.

Death Anxiety during COVID-19	A lot	Sometimes	a little bit	Not at all	P-Value
Been nervous and anxious	19%	12%	28%	41%	< 0.001
Unable to stop or control worrying	15%	13%	32%	40%	< 0.001
Worried too much about different things	23%	9%	31%	37%	< 0.001
Had trouble relaxing	18%	14%	28%	40%	< 0.001
Been so restless that it was hard to sit still	17%	22%	24%	37%	< 0.001
Been easily annoyed or irritable	24%	8%	30%	38%	< 0.001
Afraid of something awful might happen	24%	15%	23%	38%	< 0.001

## 4. Discussion

Pakistan's population that is about 21 billion whereas no; of patients those who were COVID-19 positive were about 298,509, subject recruited for this descriptive study were 385 from all over Pakistan. Data was collected via online survey among people those who can read and understand the questionnaire, age between 13 years to 70 years with average age of 24 years.

This study covers three marks that were highly affected during COVID-19 situation,

- 1) General health
- 2) Death anxiety
- 3) Stress anxiety

On wider scale it was evident that physical activity limited in 63% noted that is more than half of our sample showing compromised general health whereas 37% reported no such change in physical health. Another portion of general health which is associated with emotional facts such as in depression, anxiety or pain affecting physical activity showed 60.5% reported evident changes, 39.5% reported no changes. Another factor that is associated with physical and emotional problems affecting social events during COVID was 50% whereas rest 50% reported no effects. Study shows wide range of sudden inactivity due to lockdown and social isolation and precautionary measure to break the chain of pandemic spread resulted that led to cardio vascular health hence cardiac risks were reported [23-25]. Research enlighten that inactivity during this pandemic was general health risk factor, worsening of rheumatic diseases and affecting overall life style [23].

More over death anxiety was reported by 61% participants, in addition to this 60% were afraid of illness as COVID-19. On the other hand 87% reported fear of dying painful death where as 54% reported fear of life after death subject. Study ensure mark ratio of death anxiety in progressive diseases that lasts for a long time not only physical but mentally too. Death anxiety can be seen in many forms, anxiety associated with future predictions about life threatening diseases following painful death, and hereafter, however researcher indicated different forms of death anxiety many Muslims reported death anxiety because of fear related to punishment of grave as per revealed in Holy Book [20-26].

Furthermore, study also comprises that anxiety during this pandemic was estimated from the questions regarding stress and anxiety was 61% of the participants. 62% reported easily annoyed or irritable during the confinement of pandemic spread. On the other hand, 62% participants reported anxious about something awful might happened.

Anxiety, stress or tension was reported by many health care professionals, those who observes pain, suffering from death during swine flu outbreak. This situation is also seen during this pandemic affecting overall wellbeing [4-15].

Older age population with known comorbidities taking immunosuppressant are at high risk during this pandemic rheumatic disease and other diseases along with quality of life gets affected, study encourage health care professionals

to promote tele-exercise programs to promote activity under these circumstances by maintaining social isolation [23, 24].

Studies reported changes in cardiovascular system within some weeks (1-4 weeks) of inactivity, researches encourage people to maintain healthy life style during this pandemic to overcome the secondary complications [25].

Exercise Programs designed during this pandemic must be a considered as basic component among people isolating them to prevent spread of COVID [25].

A multicomponent exercise program based on aerobic, resistance, balance, coordination and mobility training exercises along with cognitive training session that helps cope with negative impact of sedentary life [25]. Five (5) days per week is recommended in particular to quarantine situation for older population whereas moderate to high intensity is recommended for 3 to 5 days per week, moderate exercise can improve immunity but high intensity may be inhabited, mainly in people having sedentary life style [24, 25].

## 5. Strength and Weaknesses

### 5.1. Strengths

This research shows that death anxiety, stress and general weakness was seen because of inactivity and isolation during this pandemic COVID-19. Physical activity seems to be helpful recovering from stress and improve overall health. It covers results of participants from different areas of Pakistan.

### 5.2. Weakness

Limited time was at hand for this research. Results could have been more interesting if data was collected physically.

## 6. Conclusion

COVID-19 has mark effect on physical and mental health, in addition to increase death anxiety in all over Pakistan. In Contrast with our research profound effects of COVID were seen that physical and mental health both are at stack, reveals increased anxiety, stress and negative thoughts, financial difficulties engaging people in harmful behavior.

## 7. Recommendations

Physical activity could have been assessed after few sessions of exercises. Physical activity should be recommended for its impact on symptoms of psychological distress and its potential to increase positive effects. Beyond that, improved physical activity can also promote feelings of vitality. Importantly, even low-to-moderate volume and low-to-moderate intensity exercise seem to be beneficial. Indeed, as little as 10 min of moderate-intensity walking should also be recommended.

## References

- [1] Fauci AS, Lane HC, Redfield RR. COVID-19 - Navigating the uncharted [Internet]. Vol. 382, New England Journal of Medicine. Massachusetts Medical Society; 2020 [cited 2020 May 3]. p. 1268–9. Available from: <http://www.nejm.org/doi/10.1056/NEJMe2002387>.
- [2] Arshad Ali S, Baloch M, Ahmed N, Arshad Ali A, Iqbal A. The outbreak of Coronavirus Disease 2019 (COVID-19)—An emerging global health threat. *J Infect Public Health*. 2020 Apr 1; 13 (4): 644–6.
- [3] World Health Organization. Mental Health and Psychosocial Considerations During COVID-19 Outbreak. World Health Organ. 2020; (January): 1–6.
- [4] Rana W, Mukhtar S, Mukhtar S. Mental health of medical workers in Pakistan during the pandemic COVID-19 outbreak. *Asian J Psychiatr* [Internet]. 2020; 51 (20): 102080. Available from: <https://doi.org/10.1016/j.ajp.2020.102080>.
- [5] Qazi A, Qazi J, Naseer K, Zeeshan M, Hardaker G, Maitama JZ, et al. Analyzing situational awareness through public opinion to predict adoption of social distancing amid pandemic COVID-19. *J Med Virol*. 2020; 92 (7): 849–55.
- [6] Emro WHO. WHO EMRO | WHO extends support to Pakistan as it confirms its first two cases of COVID-19 [Internet]. 2019 [cited 2020 May 3]. p. 19–21. Available from: <http://www.emro.who.int/pak/pakistan-news/who-extends-support-to-pakistan-as-it-confirms-its-first-two-cases-of-COVID-19.html>.
- [7] Cucinotta D, Vanelli M. WHO declares COVID-19 a pandemic. Vol. 91, *Acta Biomedica*. Mattioli 1885; 2020. p. 157–60.
- [8] Peeri NC, Shrestha N, Rahman MS, Zaki R, Tan Z, Bibi S, et al. The SARS, MERS and novel coronavirus (COVID-19) epidemics, the newest and biggest global health threats: what lessons have we learned? *Int J Epidemiol*. 2020; 1–10.
- [9] Zu ZY, Jiang M Di, Xu PP, Chen W, Ni QQ, Lu GM, et al. Prevalence of COVID-19 in Wuhan, China. *JAMA - J Am Med Assoc*. 2020; 2019: in press.
- [10] @zfmrza ZM. I can confirm first two cases of coronavirus in Pakistan. Both cases are being taken care of according to clinical standard protocols & both of them are stable. No need to panic, things are under control. I will hold press conference tomorrow on return from Taf [Internet]. 2020 [cited 2020 May 2]. Available from: <https://twitter.com/zfmrza/status/1232707169163841537>.
- [11] Gul A. Pakistan Detects First Coronavirus Cases, Links to Iran Outbreak | Voice of America - English [Internet]. [cited 2020 May 2]. Available from: <https://www.voanews.com/science-health/coronavirus-outbreak/pakistan-detects-first-coronavirus-cases-links-iran-outbreak>.
- [12] WHO. Coronavirus Disease 2019 (COVID-19) Situation Reports. April 1 2020. WHO Situat Rep [Internet]. 2020; 2019 (72): 1–19. Available from: [https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200324-sitrep-64-COVID-19.pdf?sfvrsn=703b2c40\\_2%0Ahttps://www.who.int/docs/default-source/coronavirus/situation-reports/20200401-sitrep-72-COVID-19.pdf?sfvrsn=3dd8971b\\_2](https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200324-sitrep-64-COVID-19.pdf?sfvrsn=703b2c40_2%0Ahttps://www.who.int/docs/default-source/coronavirus/situation-reports/20200401-sitrep-72-COVID-19.pdf?sfvrsn=3dd8971b_2).
- [13] Shahid A. Two coronavirus cases confirmed in Pakistan. *Pakistan Today* [Internet]. 2020 [cited 2020 May 2]; Available from: <https://www.pakistantoday.com.pk/2020/02/26/sindh-health-two-coronavirus-cases-confirmed-in-pakistan-confirms-first-coronavirus-case-in-karachi/>.
- [14] Pakistan Coronavirus: 22,550 Cases and 526 Deaths - Worldometer [Internet]. [cited 2020 May 6]. Available from: <https://www.worldometers.info/coronavirus/country/pakistan/>.
- [15] Rubin GJ, Amlôt R, Page L, Wessely S. Public perceptions, anxiety, and behaviour change in relation to the swine flu outbreak: Cross sectional telephone survey. *BMJ*. 2009; 339 (7713): 156.
- [16] Thorson JA, Powell FC. A revised death anxiety scale. *Death Stud*. 1992; 16 (6): 507–21.
- [17] Sinoff G. Thanatophobia (Death Anxiety) in the Elderly: The Problem of the Child's Inability to Assess Their Own Parent's Death Anxiety State. *Front Med* [Internet]. 2017 Feb 27 [cited 2020 May 6]; 4 (FEB): 11. Available from: <http://journal.frontiersin.org/article/10.3389/fmed.2017.00011/full>.
- [18] Holmes EA, O'Connor RC, Perry VH, Tracey I, Wessely S, Arseneault L, et al. Multidisciplinary research priorities for the COVID-19 pandemic: a call for action for mental health science [Internet]. *The Lancet Psychiatry*. 2020 [cited 2020 Apr 28]. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7159850/>.
- [19] Lippi G, Henry BM, Sanchis-Gomar F. Physical inactivity and cardiovascular disease at the time of coronavirus disease 2019 (COVID-19). *Eur J Prev Cardiol* [Internet]. 2020 Apr 9 [cited 2020 Jun 2]; 27 (9): 906–8. Available from: <http://journals.sagepub.com/doi/10.1177/2047487320916823>.
- [20] Mukhtar S. Mental health and emotional impact of COVID-19: Applying Health Belief Model for medical staff to general public of Pakistan. *Brain Behav Immun* [Internet]. 2020; (April): 1–2. Available from: <https://doi.org/10.1016/j.bbi.2020.04.012>.
- [21] Zheng W. Mental health and a novel coronavirus (2019-nCoV) in China. Vol. 269, *Journal of Affective Disorders*. Elsevier B.V.; 2020. p. 201–2.
- [22] Nia HS, Lehto RH, Ebadi A, Peyrovi H. Death Anxiety among Nurses and Health Care Professionals: A Review Article. *Int J Community Based Nurs Midwifery*. 2016; 4 (1): 2.
- [23] Pinto AJ, Dunstan DW, Owen N, Bonfá E, Gualano B. Combating physical inactivity during the COVID-19 pandemic. Vol. 16, *Nature Reviews Rheumatology*. Nature Research; 2020. p. 347–8.
- [24] Jiménez-Pavón D, Carbonell-Baeza A, Lavie CJ. Physical exercise as therapy to fight against the mental and physical consequences of COVID-19 quarantine: Special focus in older people. *Prog Cardiovasc Dis* [Internet]. 2020 [cited 2020 Jun 2]; Available from: <https://doi.org/10.1016/j.pcad.2020.03.009>.

- [25] Pecanha T, Goessler KF, Roschel H, Gualano B. Social isolation during the COVID-19 pandemic can increase physical inactivity and the global burden of cardiovascular disease. *Am J Physiol - Hear Circ Physiol* [Internet]. 2020 Jun 1 [cited 2020 Jun 2]; 318 (6): H1441–6. Available from: <https://journals.physiology.org/doi/10.1152/ajpheart.00268.2020>.
- [26] Abdel-khalek AM, Neimeyer RA. Encyclopedia of Personality and Individual Differences. *Encycl Personal Individ Differ*. 2017; (January).