PHYSICAL ISOLATION AND ITS IMPACT ON HUMAN HEALTH DURING THE ONGOING COVID-19 PANDEMIC

OMAR HUSEJNAGIĆ, ANJA ŽNIDARŠIČ & JANJA JEREBIĆ
University of Maribor, Faculty of Organizational Sciences, Kranj, Slovenia.
E-mail: omar.husejnagic@student.um.si, anja.znidarsic@um.si, janja.jerebic@um.si

Abstract In this paper, we discuss the impacts on physical and mental wellbeing, caused by the disruption of previous lifestyles, during periods of increased physical isolation and distancing as the most common measure implemented to reduce virus transmission rates during the ongoing Covid-19 pandemic. Utilizing a multi-step data collection process, we identified changes in the recreational and eating habits of a convenient sample of students and employees of the Faculty of Organizational Sciences University of Maribor. The results of the empirical study were evaluated by professionals in the fields of psychiatry and nutrition in order to gain a more comprehensive understanding of the impacts and possible negative consequences caused of the Covid-19 pandemic on human health. According to the collected data, the pandemic itself was only partially responsible for the physical and mental state that a large proportion of participants are currently in due to social and physical distancing. Moreover, the recreational and eating habits have also changed during periods of “lockdowns” which have also affected our wellbeing as well.

Keywords:
Covid-19
SARS-CoV-2
online learning
physical distancing
1 Introduction

By the spring of 2020, the rapid spread of the novel SARS-CoV-2 virus had forced many governments to take drastic epidemiological measures to stem the rise in infection and mortality rates. Most European Union member states had taken an early initiative to respond promptly to the exponential spread of the novel SARS-CoV-2 virus by adopting a series of rigorous preventive measures that citizens of the union never experienced before. As early as March 2020, almost all European Union member states unilaterally imposed several mobility-related measures (lockdowns), drastically restricting and reducing cross-border and even inter-city movement at the height of the pandemic (Lang, 2021). As these preventive (epidemiological) measures turned into social obligations with legal consequences, a large majority of the world’s population began to view them as pervasive stressors (one of the most likely causes of mental health disorders). Earlier studies on the effects of previous pandemic outbreaks on human mental health have shown that such tense situations possess the potential to cause negative psychosocial and psychological effects on human health (Mocking et al., 2021; Chen et al., 2021).

During the pandemic, a surge in demand for mental health services was reported in most countries. Bereavement, isolation, loss of income, as well as, fear are believed to be triggering new mental health conditions and exacerbating already existing ones. On the other hand, Covid-19 can itself lead to neurological and mental complications, such as delirium, agitation, and different types of strokes. People with pre-existing mental and neurological disorders are believed to even be more vulnerable to Covid-19 infections which result in severe struggles and even fatal outcomes. These negative effects, caused by the pandemic itself, are becoming an increasing reason for concern in most developed countries worldwide (World Health Organization, 2020). In light of these unfortunate turns of events, a representative face-to-face survey was conducted in Germany to assess the presumed mental health consequences of the global Covid-19 pandemic on the general population, as well as, to identify mental health risk factors. This research had shown that loneliness did not increase, affecting about one in four participants to some extent. Younger participants and women in particular, were most likely to report depression, anxiety, and loneliness (Beutel et al., 2021).
The Covid-19 pandemic has brought an unprecedented change to peoples’ lives worldwide due to direct or indirect consequences caused by the disease itself, physical distancing, and socio-economic restructuring. However, existing knowledge about the extent of the impact that a pandemic can have on mental health is extremely limited. Previous works on the relationship between Covid-19 and mental health have focussed on relatively narrow aspects of human mental health, failing to take into account the diverse psycho-socio-economic variables that are likely to modulate the impact, as well as the self-perceived impact of the pandemic itself (Hampshire et al., 2021).

During periods of strict physical deprivation, information and communication technology-driven models proved their worth by providing both lecturers and students with a means by which it became possible to conduct the educational process in most educational institutions (Bergmann & Sams, 2012). Students in developed and developing countries (for most part) were provided with direct access to video lectures, presentations, and other digital teaching materials which allowed for social interaction with the added benefit of excluding physical interaction as was recommended by the World Health Organization responsible for disease research, control, and prevention on the international level (World Health Organization, 2020; Campillo-Ferrer & Miralles-Martínez, 2021).

As most educational institutions (on the global level) strived to comply with the recommendations of the WHO and modify their academic programs to be delivered “online” using information and communications technologies (ICT). The negative effects of this learning method on human health is only now becoming apparent.

1.1 Purpose of the research

The purpose of this research was to gain a better understanding of the impact and potential consequences that the global Covid-19 pandemic and the “online learning” method have had on the physical and mental wellbeing of the students and staff of the Faculty of Organizational Sciences University of Maribor (FOS UM).
1.2 Key definitions

- **Covid-19** (coronavirus disease 2019) is a disease caused by a virus SARS-CoV-2 discovered in December 2019 in Wuhan, China (Centre for Disease Control and Prevention, 2021).

- **SARS-CoV-2** is a novel beta-coronavirus that is closely related to two other highly pathogenic human coronaviruses, SARS-CoV and MERS-CoV (Zeng et al., 2022).

- **Online learning** is an innovative approach for delivering instructions to a remote audience (Khan, 1997).

- **Physical distancing** is a preventative measure to limit the spread of Covid-19 - this means we keep a distance of at least 1m from each other and avoid spending time in crowded places or in groups (World Health Organization, 2022).

2 Methodology

2.1 Research design

This research involves a mixed-methods approach. In the first phase, an online survey was created and conducted with a convenience sample consisted of members of the faculty staff and students population to assess the impact of which physical distancing and frequent lockdowns has had on their lives. The survey consisted of two domains as follows: physical activity and eating habits. A 5-point Likert type scale was used by the participants to evaluate twelve statements. In the second phase, several interviews were conducted with trained professionals from various scientific fields such as neuropsychiatry and nutrition science. The results obtained from our surveys were interpreted by our professionals who also provided their professional opinions on the impact of the global Covid-19 pandemic on overall health and wellbeing.
2.2 Population and research design

The survey was made available only to students and staff of the FOS UM. The survey was designed in 1KA, an application that provides services for online surveys (1KA-Spletne ankete, 2019). Students were enrolled in one of FOS’s three study cycles (1st - Undergraduate, 2nd - Master’s or 3rd – Ph.D.) in the academic year 2020/21 and the survey was conducted between June and August 2021. The faculty staff refers to faculty employees (regardless of their professional position) who were employed at the time of the survey. The interviewees were selected based on their availability and professional expertise. The interviews were arranged with each interviewee individually in July 2021 among professionals in Bosnia & Herzegovina and Slovenia.

2.3 Quantitative research in Slovenia

The research was performed by implementing an online survey with a convenient sample. The survey was made available during a period of 67 days (from June 16th to August 23rd of 2021) to students and staff at the FOS UM via an online survey. The surveys were distributed via email, social media, calling and messaging apps etc.

2.4 Qualitative research in Bosnia & Herzegovina

The research was performed by conducting two live interviews in the city of Tuzla (Bosnia & Herzegovina) in July 2021. The interviews were arranged and performed with several trained professionals from various scientific fields such as neuropsychiatry and nutritional science. The interviewees were selected based on their professional expertise and availability. The interviews were arranged with each interviewee individually via various methods of communication.

2.5 Research tools development

2.5.1 Survey

The first phase of data collection involved the development and distribution of an online survey to the target population. The survey questions were developed based on new and emerging literature discussing the potential impact and consequences of the ongoing Covid-19 pandemic on people’s physical and mental wellbeing. The
questionnaire items were composed by the first author of the paper, taking into account the methodological recommendations on survey questions (Suskie, 1996). The survey boasted twelve questions in total with the addition of three demographic questions at its end. A 5-point Likert type scale was chosen due to this rating methods well established reputation and effectiveness in measuring attitudes and opinions rather than factual information. Responses to each question (with the exception of demographic questions) were rated based on the following headings (Completely disagree = 1, Disagree = 2, Nor disagree, nor agree = 3, Agree = 4, Completely agree = 5).

2.5.2 Interviews

Each interview for this research consisted of about a dozen questions related to the scientific field in question. The main purpose of the interviews was to interpret our survey results by experts and obtain their professional opinions regarding the impact of the global Covid-19 pandemic on human health and wellbeing. The interviews were conducted live and in each case, the interviewee allowed the interview to be recorded on a voice recorder. Each recorded tape was analysed to write accurate interview transcripts that were returned back to the interviewees for evaluation. The interviewees deemed all transcripts to be accurate and legitimate.

3 Quantitative research results

3.1 Demography

Our online survey was successfully completed by 46 individuals, out of which 20 were male (43%) and 26 were female (57%) respondents. The youngest respondent was 19 years old, while the oldest respondent was 55 years old. The average age of the respondents was 24 years. Out of 46 individuals which took part in the survey; twenty-six were Undergraduate students (57%), fourteen were Master’s students (30%) and six were faculty employees (6%).
3.2 Physical activity

The “physical activity” section of the survey contained six questions whose purpose was to evaluate our respondent’s attitude towards physical activity and the effects which the global Covid-19 pandemic along with the resulting restrictions on movement and physical contacts have had on their lives.

We conducted a frequency analysis of the answers to the six questions of the “physical activity” section of the survey (see the questionnaire in Appendix) and found out that our respondents are very much aware of the positive health benefits that result from regular and adequate physical activity and the positive effects it can have on the human body and mind \((\text{Regular and adequate physical exercise results in a diversity of health benefits to the human body and mind})\). Our survey respondents have also reported that the restrictions on movement and physical contact have made it more difficult but not impossible to conduct regular and adequate physical exercise \((\text{The restrictions on movement, caused by the global Covid-19 pandemic, have made it next to impossible to conduct regular and adequate physical exercise, I haven’t had as much physical exercise as I would have liked due the restrictions on movement caused by the global Covid-19 pandemic})\). As a result of the global Covid-19 pandemic and the duration of strict movement and physical contact restrictions, our survey participants have largely reported a noticeable deterioration of their physical and mental health \((\text{I noticed that the recent restrictions on movement, caused by the global Covid-19 pandemic, have had a negative effect on my overall health})\). Furthermore, our respondents reported that the quality of their lives has somewhat deteriorated during these periods of strict physical isolation and deprivation and that there are experiencing noticeable difficulties when it comes to adjusting back to their old recreational and living habits after periods of increased physical distancing \((\text{The quality of my life has decreased significantly as a result of the restrictions on movement caused by the global Covid-19 pandemic, I am finding it rather difficult to adjust back to my old recreational habits in the wake of the global Covid-19 pandemic})\).

3.3 Nutritional (eating) habits

The “nutritional (eating) habits” section of the survey consisted of six questions whose purpose was to evaluate our respondent’s nutritional habits and eventual changes to their diets during the period of increased lockdowns and reduced physical contacts as a response to the global Covid-19 pandemic.
We conducted a frequency analysis of the answers to the six questions of the “nutritional (eating) habits” section of the survey and concluded that our respondents generally preferred a “healthy diet” as opposed to fast-food (When I am given a choice to eat fast-food or healthy food, I choose healthy food). Respondents reported that they consume a variety of fruits and vegetables on a daily basis often without taking into account the nutritional values of their meals before consuming them (I consume a variety of fruits and vegetables on a daily basis, I always take into account the nutritional values of my meals before choosing/eating them). During periods of increased “lockdowns” and restrictions on movement and physical contacts, our respondents have reported consuming more food than usual, claiming that they did not include fast food in their daily diet (I started to consume more food than usual during the restrictions on movement caused by the global Covid-19 pandemic, I consume fast-food on a daily basis). Our respondents generally expressed undecidedness when it comes to incorporation of immunological supplements in their diets (I consume immunity supplements as a mean to replenish/compensate the lack of variety of fruits and vegetables in my diet).

4 Interviews

4.1 Interview with Doc. dr. med. sci. Elvir Bećirović (Department chair at the Psychiatric hospital (University Clinical Centre of Tuzla, B&H))

According to Bećirović, the restrictions on movement and physical contact induced as preventive measures to reduce viral-transmission rates of Covid-19 have affected our population in more than one way. Some of the most notable negative impacts were caused by the deprivation of social contact/interaction. The term “social distancing” was often used and repeated in public and was commonly misunderstood. Maintaining physical distancing should have been enforced, while maintaining social contact should have been encouraged even if it could only be carried out via digital means. On the other hand, the lack of adequate and regular physical activity, has also taken its toll on the mental health of our population as well, by negatively affecting various mental functions as well as contributing to the development of certain types of mental disorders.
Regular physical activity has proven as effective in treating mild forms of depression as anti-depression medications. Patients suffering from depression who are prescribed anti-depression medications usually experience depression again as soon as they get off their therapy. Patients who introduce regular physical activity often manage to stay stable without experiencing depression again. It is still not clear how physical activity affects the human mind although medical research on depression (conducted since the 1900s and continuing till today) is showing a constant rise of depression disorders.

The lack of movement and physical activity (during the periods of intense “lock downs” and physical distancing) is one of the most likely causes for the surge of depression-related disorders. Physical activity (muscular activity) stimulates the brain, which makes us feel better. There are a number of factors that can contribute to making us feel better, and it is difficult to single out one factor in particular.

When it comes to online lecturing/learning, it simply lacked that level of social interaction which existed before the global Covid-19 pandemic. Student’s daily routines, from waking up in the morning to experiencing social contact, were disrupted. All of this had negative impact on students’ motivation and their ability to study. The global Covid-19 pandemic not only affected students’ motivation, but also increased the level of anxiety and depression. All of this affected the students’ ability to memorize and concentrate, which was reflected in their academic performance.

To reverse the negative mental health effects experienced by our respondents (which have derived as a result of the global Covid-19 pandemic), our respondents should maintain social contacts and interactions even if it can only be realised via digital means. Besides that, regular physical exercise should be conducted and complemented by an adequate diet and limiting one’s exposure to news as a mean to minimize anxiety and depression.

The microbiota or the “gut microbiota” is connected to the human brain/mind. Many medical studies have been conducted in this field and special emphasis is given to it on psychiatric congresses because not much is known about it. The “happiness hormone” is not located in the human brain but rather, for the most part, in the digestive system. There is a connection between the digestive system and the
brain/mind, although much is still unknown about it. For some people a protein diet is most appropriate, while for others a vegetarian or a carbohydrate diet is better.

4.2 Interview with Prof. dr. sci. Midhat Jašić (Department chair of food science at the Faculty of Technology (University of Tuzla, B&H))

According to Jašić, even though there are over 7 billion people currently inhabiting planet Earth, no two people have the same body and digestive tract. These small variations are the one’s that define each individual’s diet. It is important to consume foods that are moderate, diverse, local and seasonal. Most recommendations on this topic are not scientifically based and some people even go as far as defining certain weight control diets which have the potential to damage internal organs.

Covid-19 is a disease which can manifest itself both symptomatically and asymptptomatically. A person’s diet can affect the strength of their immune system through the consumption of certain foods. Part of our students diets is based on fast food. Some of the reasons behind this negative trend lie in the availability of fast food as well as the lack of elementary nutrition knowledge. Consuming excess amounts of carbohydrates can lead to weight gain, hypertension, diabetes, blood vessel disorders, allergies, etc. Health status depends on a variety of different factors such as physical activity, stress, quality of sleep, etc. In regards to food and beverage consumption, one should avoid alcohol, coffee, drugs, sugar, white flour, salt, oils, etc. An average student should consume five meals a day, which should be moderate, local, diverse, and seasonal to maintain a healthy diet.

When it comes to the consumption of immunological supplements, they should be avoided by students and instead taken by individuals who have reached or exceed the age of 50 years to strengthen their immune system. Once a person reaches the age of 40 years, their body begins to reduce the production of superoxide dismutase, glutathione peroxidase, glutathione catalase, etc., which are needed for the immune system. All of these elements can be found and purchased in pharmacies and should be consumed regularly. Supplements that strengthen the immune system are those that derive from milk (colostrum), eggs (lysozyme), meat (carnitine), mushrooms (selenium and zinc), etc.
Discussion

Since its emergence, the novel SARS-CoV-2 virus has altered life as we know it. Simple things we used to take for granted, like going to work, have (at one point) become life-threatening. With the adaptable and deadly nature of the virus threatening entire populations, many governments around the world have implemented preventative measures such as movement and physical contact restrictions as the only means to limit the rates of transmission of the virus until an adequate medical response could be developed in the form of a vaccine. With the use of adoptive information and communication technologies and infrastructure, life and work took on a new form very different from what we were all used to.

Information and communication technologies allowed many branches of the economy to stay operational and in some cases, to flourish. Higher educational institutions were also among the first to implement “online learning” as a means to continue their educational programs. What many overlooked was the potential negative impact this transition along with strict isolation and restrictions on physical contact could have on the physical and mental health. One could argue that the risk (given the situation) was worth it because possible alternatives were scarce.

During the duration of this research, we found that the restrictions on movement and physical contact, which forced the Faculty of Organizational Sciences University of Maribor to adopt an “online learning model”, as was the case in the vast majority of educational institutions around the world, negatively impacted the physical and mental health of students and academic staff due to a conscious and unconscious change of previously existing lifestyle and working habits. Concretely, the restrictions on movement and physical contact have made it difficult and even dangerous to engage in physical activities. The lack of regular and adequate physical exercise during periods of increased lockdowns has negatively impacted a range of mental functions and contributed to the development of certain types of mental disorders. During periods of increased lockdowns and physical isolation, our respondents not only reported to have exercised substantially less but also changed their diet. We found out that our respondents ate more food than usual during the periods of increased lockdowns. Once again, our respondents reported their preference for “healthy dishes” but generally did not pay attention to the exact nutritional values of the meals.
All of these lifestyle changes had certain negative effects on our overall physical and mental health. The health status depends on a variety of different factors, such as physical activity, stress, sleep quality, human interaction, etc. One of the most disturbing findings was the negative impact resulting from the use of the term “social distancing” (mainly in media). Maintaining physical distancing should have been enforced, while maintaining social contact should have been encouraged, even if it could only be carried out via digital means. The global Covid-19 pandemic has negatively impacted our lives and will continue to do so for the foreseeable future. Prevention (in the form of vaccination) is the only way to end the ongoing pandemic, according to our interviewed experts. The negative physical and mental effects of the pandemic on our bodies and minds appear to be minimal and can be positively reversed.

6 Conclusion

This research aimed to identify the impacts of the ongoing global Covid-19 pandemic on human health. Based on our quantitative and qualitative analysis, we can conclude that the restrictions on movement and physical contact which were implemented by most governments as means to decrease virus transmission rates have negatively impacted the overall health of the respondents. The reported lack of physical activity has taken its toll on the mental health of the population by negatively affecting various mental functions and contributing to the development of certain types of mental disorders.

Online lectures simply lack the level of interaction when compared to live lectures. All of this negatively affected our respondents’ motivation and ability to concentrate and comprehend new, extensive, and complex information. The restrictions on movement and physical contact were often misunderstood and misinterpreted by our respondents, resulting in an increase level of anxiety and the development of mild forms of depression, which reflected in poorer academic performance according to our interviewed experts.

Humans are creatures who inherently need and crave for social contact, even though we were purposefully separated for longer periods of time over and over again during the duration of the global Covid-19 pandemic. In normal circumstances we all took services provided by barbers, masseuses, makeup artists, pedicurists, etc. for
granted and failed to appreciate their true value until we lost them. To overcome these negative effects on our health, we should put more emphasis on a healthy lifestyle from conducting regular physical activity (four times a week) to planning and implementing a correct/adequate nutritional diet. We should reorganize our daily life, fully appreciate what is truly important to us and spend more time with individuals who inspire us rather than those who disappoint us.

Since the global pandemic is only a few years old, future research on this topic should be aim to identify the most common disorders and medical conditions (mental or otherwise) that were directly or indirectly caused by periods of increased physical isolation such as we experienced during the peaks of the global Covid-19 pandemic.

References


Appendix

A. Example of the survey

This survey is being carried out by a Master’s student at the Faculty for Organisational Sciences (University of Maribor) with the intent on analysing the current physical and psychological state of the student body and the faculty staff at the faculty. The data acquired from this survey will be incorporated into a comprehensive research project which will serve as a basis for the development of a detailed instruction manual as a response to new changes currently being faced by the student body, as well as, the faculty staff which have derived as a result of the global Covid-19 pandemic.

This survey is anonymous! Thank you for your time and support in advance!

Instructions

The survey contains twelve statements divided into two categories which are to be answered by choosing the most appropriate answer!
### Physical activity

<table>
<thead>
<tr>
<th>Statement</th>
<th>Completely disagree</th>
<th>Disagree</th>
<th>Nor disagree, nor agree</th>
<th>Agree</th>
<th>Completely agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular and adequate physical exercise results in a diversity of health benefits to the human body and mind.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I noticed that the recent restrictions on movement, caused by the global Covid-19 pandemic, have had a negative effect on my overall health.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The restrictions on movement, caused by the global Covid-19 pandemic, have made it next to impossible to conduct regular and adequate physical exercise.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I haven’t had as much physical exercise as I would have liked due the restrictions on movement caused by the global Covid-19 pandemic.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The quality of my life has decreased significantly as a result of the restrictions on movement caused by the global Covid-19 pandemic.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am finding it rather difficult to adjust back to my old recreational habits in the wake of the global Covid-19 pandemic.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Nutritional (eating) habits

<table>
<thead>
<tr>
<th></th>
<th>Completely disagree</th>
<th>Disagree</th>
<th>Nor disagree, nor agree</th>
<th>Agree</th>
<th>Completely agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>When I am given a choice to eat fast-food or healthy food, I choose healthy food!</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I consume a variety of fruits and vegetables on a daily basis!</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I always take into account the nutritional values of my meals before choosing/eating them.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I started to consume more food than usual during the restrictions on movement caused by the global Covid-19 pandemic.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I consume fast-food on a daily basis.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I consume immunity supplements as a mean to replenish/compensate the lack of variety of fruits and vegetables in my diet.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Demographics

What is your gender?

- [ ] Male
- [ ] Female
What is your age in years?

What is your occupation at the Faculty for Organisational Sciences (University of Maribor)?

- Undergraduate student
- Ph.D. student
- Master’s student
- Employee (member of the staff regardless of the position)