

The impact of COVID-19 on fitness behaviour amongst a sample of the Maltese population

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BACKGROUND

The global pandemic of COVID-19 has brought significant changes all over the world, including Malta. These changes might have impacted people's health and their lifestyle. Such changes might have limited health and fitness behaviours such as frequency of exercise, intensity of exercise and water intake. Therefore, this study aims to examine and explore how the COVID-19 pandemic has impacted fitness behaviours amongst a sample of the Maltese population.

METHODS

The sample ($n=995$) was selected through convenience sampling. Data was collected through an online 38-item survey which was dispersed on social media during April and May 2020. The questions measured the frequency of health behaviours to provide a comparison between the participant's health behaviours in November 2019 and April 2020, during the COVID-19 pandemic.

RESULTS

The data was analysed through Factor Analysis which was conducted for dimension reduction. Factor analysis resulted in one factor composed of three variables (frequency of exercise, intensity of exercise and water consumption). Further analyses were conducted using a paired samples t-test on SPSS. Following analysis, the results showed that there was an increase in exercise frequency amongst the sample population, whereas there was a decrease in exercise intensity and water consumption. These results confirm that there was a change in health behaviours amongst the study's sample.

CONCLUSION

This study recommends further investigation as to understand this difference in behaviours and its attributes. This can help inform health behaviours should there be further waves of the pandemic or other lockdowns.

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INTRODUCTION

The novice pandemic, COVID-19 has brought about significant changes across the world. Research about the impact of the pandemic is still growing and developing, however, there is a minimal understanding about the impact of COVID-19 on people's health and lifestyle. Despite the limited research available, emerging studies show that the pandemic did impact people's health and lifestyle.¹⁻⁴ In fact, one of the pandemic's impact was seen on physical activity as it posed a challenge to exercising.⁵ It has affected people's exercise patterns and frequency levels.⁶ Due to the virus' widespread reach and uncertainty, countries encouraged the closure of fitness centres, gyms and physical activity classes amongst other limitations. This was done with the aim to reduce the spread of the virus. The United Nations (2020) suggested that with such closure and limitations of activities, individuals tend to be less physically active and consume less healthy dietary food intake, thus impacting people's lifestyle negatively. In addition to this, the World Health Organization (WHO) (n.d.) emphasised the importance of physical activity during the situation of the pandemic throughout all age groups.

In a recent study looking at exercising behaviour amongst a population in Belgium,⁶ it was found that half of the participants exercised more during the pandemic, whilst the other half exhibited more sedentary behaviour during the pandemic. Reasons for not exercising included missing their normal ways of exercising include not having enough time and due to sitting more since they were working from home.⁶ This suggests that people's physical activity levels have been affected negatively.

Since reducing the spread of the COVID-19 virus was the main priority throughout this pandemic, issues regarding maintaining physical activity routines, has been left un-tackled.⁷ Staying at home has been seen as a fundamental safety measure to limit human to human transmissions, however, it can be said to have brought some negative consequences. One of the most crucial issues is that physical activity can be reduced. Extended periods of time at home can amplify sedentary behaviours such as; immoderate amount of time sitting or lying down to engage in screening activities including playing video games, watching television, or using mobile devices.⁷ Excessive home stays may also lead to physical inactivity and higher risks of developing symptoms of anxiety and depression. These in turn may result in the likelihood of chronic health conditions.⁷ It is believed that physical inactivity is accountable for approximately 10% of non-communicable diseases globally. Such disorders, among others, could include autoimmune diseases, strokes, heart disease, and diabetes. Moreover, immobility can expedite the loss of functional capacities with aging, which diminishes life expectancy. This brings large consequences such as those acclaimed risk factors like smoking and obesity.⁸

Government measures that limit people's movements during the COVID-19 pandemic do not convey that physical activity must be eliminated. Exercising has been shown to provide better health for both healthy individuals as well as for patients with various diseases.⁷ It does not only constitute as an important aspect of illness prevention but is also serves as a remedy for inactivity-associated disorders. Being physically active can be seen as a non-pharmacological way to boost one's general health.⁸ Studies have

shown that frequent training can enhance one's immune retaliation to respiratory pathogens. Maintaining a physically active lifestyle, instead of a sedentary one, can help in managing and restricting infection repercussions. Research also supports that regular and balanced exercise can improve antibacterial and antiviral immune monitoring, decrease swelling, and delay aging.⁸

According to the World Health Organisation (2011), 18- to 64-year-olds should engage in at least 150 minutes per week of moderate-intensity exercise per week. Lack of exercise can lead to diseases and illnesses, such as obesity.¹² A person who exercises frequently increases their chances of having healthier bodies.¹¹ In Malta, only 25% of 10–11-year-olds and only 36% of 18–64-year-olds practice sufficient physical activity levels.¹³ This shows that the majority of 10–11-year-olds and 18–64-year-olds are not meeting the physical activity requirements proposed by the World Health Organisation. In summary, despite the importance and benefits of physical activity, the Maltese population is not exercising enough.¹⁴

On their website, the World Health Organization¹⁵ also illustrates several home-based exercises and relaxation techniques, which one could implement in their own home. WHO, suggest 150 minutes of moderate-intensity or 75 minutes of vigorous-intensity of exercise each week. These can be easily achieved at home with limited space and without the use of special equipment. They also provide some hints on ways to stay active during the COVID pandemic. They advise the public to take short active breaks throughout the day, which may include dancing, stretching, or performing relaxation exercises for a couple of minutes.¹⁵ One can also choose to follow online classes, watch exercise videos on

YouTube, or download applications which be easily accessed through various digital devices.¹⁶ WHO, also exhibits various exercises on their website, highlighting their main objectives. These include workouts to strengthen the physical body as well as exercises that increase heart and breathing rates.¹⁵ Out-door exercising is still an option; however, one should maintain a certain distance from other people.¹⁶

According to the Harvard T.H. Chan School of Public Health (2006), while there is no singular volume of water that is recommended for individuals as one's need varies depending on food, weather and physical activity, the Guidelines recommend 20-50 ounces (0.6-1.5 litres) of water daily. Having said this, they are still aware of the varying need in water intake amongst individuals, as this depends on one's food consumption, physical activity, environmental factors such as the weather amongst other factors. The UK Food Standards Industry (FSA) similarly recommends 6 to 8 glasses (1.2 litres) per day. A local study of water consumption found a similar distribution for both men and women respondents, with the highest percentage indicating that 67.76% of the respondents consume water 6-7 days per week.¹⁸ Drinking water and remaining hydrated, especially after exercise has been found to improve cognitive function¹⁹ and help in dehydration prevention.²⁰

When new cases of COVID-19 started emerging in different countries, each country responded in a similar manner by imposing a lockdown to reduce the spread.⁶ This is because it has been shown that with lockdown there was a significant decrease in the growth rate of new COVID-19 cases in China.²¹ Therefore, each country adopted different levels of lockdown.⁶ In Malta, schools, gyms

and public spaces were closed, shopping was limited to necessary shops only and people were encouraged to work from home when possible. The authorities encouraged citizens to remain indoors as much as possible to limit the spread of the virus; they “urged people to only go out if absolutely necessary and to maintain a distance between themselves and others they might come across while outdoors.”²² People were encouraged to go out only for necessities; these included “going to work for a critical reason and for a short period of time; exercising child visitation rights; feeding or caring for animals which are located somewhere other than their home; going to the bank” ²² This suggests that with the closure of gyms and public spaces, together with limited commute to work and only going out for necessities, might have impacted the population’s exercising habits. According to the authors’ knowledge, there has been no research yet in Malta looking at the impact of COVID-19 on health behaviours. Therefore, this study aims to understand the fitness behaviours amongst the Maltese population during the COVID-19 pandemic, if any.

To help achieve this aim, this study attempts to answer the following research questions:(*RQ1*) Did the Maltese population exercise more or less during the pandemic?

(*RQ2*) Did the Maltese population exercise more or less intensely during the pandemic? And (*RQ3*) Did the Maltese population consume more or less water during the pandemic?

In addition, this study submitted the following hypotheses:

- H0 - There is no significant relationship between the frequency of exercise before and during COVID-19.

- H1 - There is a significant relationship between the frequency of exercise before and during COVID-19.
- H0 - There is no significant relationship between the intensity of exercise before and during COVID-19.
- H1 - There is a significant relationship between the intensity of exercise before and during COVID-19.
- H0 - There is no significant relationship between the consumption of water before and during COVID-19.
- H1 - There is a significant relationship between the consumption of water before and during COVID-19.

METHODS

Materials

To examine the frequency of how people conducted certain behaviours, a quantitative approach was deemed fit. Data was collected through a self-developed 38-item questionnaire. The questions asked about daily behaviours, such as hand washing, exercise, consumption of water, and diet amongst others. Each question required the participants to answer how frequent their health behaviours occurred in November 2019 and at the time of data collection. This questionnaire was designed on Survicate (<https://survicate.com>), as it offered user-friendly features for the participants. Demographic questions for Gender, Sexual Orientation, Age, Relationship Status and Location were acquired in order to understand the demographics of our sample.

Ethical Consideration

To ensure the conduct of ethical research and protection of participants from any harm, the code of conduct for ethical research was

used²³. Prior to starting the survey, participants had to provide their consent for participation and were made aware of their rights as participants. Participants had the right to freely withdraw by closing the survey window anytime up until submitting their final answers. This was defined as submissions would be anonymous and confidential, thus limiting the identification and erasing of their data. Participants could change any previous answers freely until their submission. Participants were also given the option to skip any questions they did not wish to answer by leaving that question blank. Participants' participation was kept anonymous in order to maintain their confidentiality and remain unidentifiable. The questions asked in the survey were about daily behaviours therefore, thus limiting the possible ethical risk or harm posed on the participants.

Sample and Data Collections

Participants were recruited through convenience sampling, with the questionnaire being shared on social media platforms including Facebook, Instagram and Twitter. Anyone on these social media platforms could participate after they consent to confidentiality and voluntary participation. Data was collected from 16th April 2020 up to 16th May 2020.

When data collection finished, $n=1413$ however, the data was looked at and cleaned since there were non-Maltese participants and unfinished entries. After cleaning the data, $n = 995$. Since variables were categorical, they were re-coded to allow easier data analysis. Data was analysed using IBM SPSS Statistics 26. Factor Analysis was used for dimension reduction and further T-tests were conducted based on the results of the Factor Analysis.²⁴

RESULTS

Descriptive Statistics

A total number of 995 participants participated in this survey. An overview of the frequencies of the final demographic sample can be found in Table 1. Most of the sample were females and heterosexual, aged between 31 and 40, and in a relationship.

Inferential Statistics

Factor Analysis was conducted to observe which factors are significant.²⁴ As a result one factor was observed. This factor was composed of three variables which included (1) intensity of exercise, (2) frequency of exercise and (3) consumption of water. These were grouped together under the name (1) pre-personal fitness and (2) post-personal fitness. Pre-personal fitness refers to the variables measuring the frequency of fitness behaviours in November 2019, whereas post-personal fitness refers to the variables measuring the frequency of fitness behaviours in April 2020.

A paired samples t-test was conducted to compare the participants' drinking water, exercise intensity and exercise frequency before COVID-19, under the computed variable label 'Pre-personal fitness', and their behaviours at the time of data collection, under the computed variable label 'Post-personal fitness'. Through this test, a significant association was found between the variables 'Pre-personal fitness' ($M=4.58$, $SD=1.41$) and 'Post-personal fitness' ($M=4.45$, $SD=1.38$), $t(0.98)=2.57$, $p<0.01$. Results showed that participants drank less water during COVID-19 ($M=1.63$, $SD=.63$) when compared to six months before ($M=1.70$, $SD = .64$). Whereas participants had increased their exercise frequency during COVID-19 ($M=2.91$, $SD= 1.66$) when compared to six months before ($M=2.78$,

$SD=1.56$), their intensity levels of exercise during COVID-19 were reduced ($M=1.37$, $SD=.54$) when compared to six months before ($M=1.49$, $SD=.63$). Therefore, this shows that COVID-19 has impacted participant's fitness behaviour by decreasing water consumption

and intensity of exercise whilst increasing the frequency of exercise.

Table 1 Demographics of the sample

Characteristic	Number Of Participants
Gender	
Female	751 (75.5%)
Male	240 (24.1%)
Non-Binary	1 (.1%)
Prefer not to say	1.(1%)
Sexual Orientation	
Heterosexual	829 (83.3%)
Homosexual	65 (6.5%)
Asexual	5 (.5%)
Pansexual	5 (.5%)
Bisexual	42 (4.2%)
Other	48 (4.8%)
Age	
15 - 18	45 (4.5%)
19 - 21	122 (12.3%)
22 - 25	215 (21.6%)
26 - 30	212 (21.3%)
31 - 40	233 (23.4%)
41 - 50	113 (11.4%)
51 - 60	41(4.1%)
61+	14 (1.4%)
Relationship Status	
Divorced	3 (.3%)
In a relationship	489 (49.1%)
Married	277 (27.8%)
Separated	21 (2.1%)
Single	203 (20.4%)
Widowed	1 (.1%)

DISCUSSION

This study aimed to understand how COVID-19 might have impacted people's health behaviours. The results confirm that there was a significant relationship between the exercise frequency, exercise intensity and water consumption before and during COVID-19. Therefore, this study rejects the null hypotheses and accepts the alternate hypotheses. These will be discussed further below, through answers for the research questions posed.

As an answer to RQ1, this study found that the frequency of exercise has increased. This increase is like the reported increased frequency of exercise in the study conducted by Constandt et al. (2020). However, this study did not measure any sedentary behaviour and therefore cannot tell if the results of sedentary behaviour were similar or not. This increase in exercise frequency can be contributed to various assumptions. This study assumes that the increase could be due to the accessibility of free fitness material on social and traditional media. During the pandemic, a lot of free physical activity resources were available for people to make use of. Letieri & Furtado (2020) suggested maintaining an exercise regime using social media during lockdown to keep people active. This can therefore suggest that, if free exercise resources or regimes are more available, people can and will exercise more. The relationship between physical activity levels and the availability of resources was not studied directly and therefore, this study suggests further studying on the impact of free resources on fitness.

Another assumption is that due to the lockdown, people being locked inside automatically might have reduced the number

of tasks and errands. As a result, some people had more time available and therefore, might have had more time to exercise when compared to before. This is like what was found in study conducted by Constandt et al. (2020), since their participants had an increase in time availability. Another assumption as to why there might have been an increase in exercise frequency, can be attributed to the theory of unavailability.²⁵ This theory states that items that are scarce and unavailable increase the people's desire to achieve them. Therefore, this argues that since outside behaviour was limited and scarce, people wanted it more and had a higher affinity towards it, hence increasing the chances of exercise. Another assumption could be the fact that, as citizens felt powerless and out of control, they engaged in activities which gave them meaning as well as self-control. Self-control and meaning in life are recognized as psychological resources, which can be fundamental to adapt and cope during major life events.²⁶ Nevertheless, terrible stressful episodes can stimulate crises of meaning and threaten existential security. Self-control can elucidate the ability to change inner reactions. Moreover, having self-control can also stop undesired behaviour. Meaning in life may help people perceive stressors as a challenge rather than loss.²⁶ Furthermore, having a purpose can serve as a motivation in times of crisis. COVID-19 has engendered countless changes in one's life, such as job loss and death. Here a person might feel not in control of his own life. Choosing to engage in more physical activities may be one of the reasons people choose, to successfully cope with the traumatic event of the current pandemic.

The final assumption is an increase in exercise frequency to maintain better mental health. Petty, Sharma & Madaan (2006) stated that

physical activity aided individuals to reduce depressive and low moods, whilst also aiding in reducing feelings of anxiety. This means that since the pandemic evoked various levels of anxiety, people might have resorted to physical activity to help them alleviate their stress and mood. All these assumptions made by this study could differ with time and a different sample. This proposes further in-depth qualitative studies as to understand the reasons why people increased their frequency of exercise during the pandemic.²⁷

As an answer to RQ2, this study found that the intensity levels of exercise have decreased. Dr Jeffrey A Woods, in an interview with Zhu (2020) claimed that regular and moderate intensity of cardiovascular exercise can have protective factors to one's immunity. This suggests that people's level of intensity need to be moderate to be beneficial.²⁸ Even though moderate intensity proves to be beneficial, the sample's intensity levels decreased. This difference can be attributed to the closure of gyms and lack of heavy weight equipment at people's home. Even though the intensity of exercise could have been enhanced with different home items, it seems that home exercise still limited the intensity.⁸ Apart from the closure of gyms, fitness classes and exercises were also stopped to avoid gatherings of people and therefore might have changed the intensity level. Another assumption about the decrease of intensity can be attributed to people choosing to walk, run or exercise at home as their main form of exercise. This can be due to accessibility and might have changed their intensity levels. In summary, this suggests further qualitative and quantitative studies to understand the difference in intensity between active and non-active people and their attributes.

As an answer to RQ3, this study found that water consumption levels decreased. According to the authors' knowledge, no studies were found that looked at the level of water consumption during COVID-19. In addition, no studies have looked at the level of water consumption amongst the Maltese population. Our results suggest a decrease in consumption which is worth further analysing to identify the relationship between COVID-19 and water intake. Water intake can be assumed to vary due to several factors, such as temperature levels, weather, levels of activity, sedentary behaviours amongst many others. It can be assumed that the decrease in exercise intensity could have led to this change in the levels of water consumption. Therefore, this study recommends further investigation to understand the relationship between exercise and water consumption. This study also suggests delving into the Maltese population's drinking habits and using the data collected to provide comparison with other countries.

CONCLUSION

The strengths posed by this study include an understanding of how the first wave of the COVID-19 pandemic affected fitness behaviours amongst a sample of the Maltese population. This is useful since the pandemic is expected to result in more than one wave and possibly prevails for a longer period. Therefore, the data collected can be used to shape and formulate guidelines and policies to enhance fitness behaviours amongst the Maltese population.

On the other hand, this study also had its limitations. For example, since participants were recruited through social media, non-social media users were not exposed to the possibility of participating in this research. This population might have had differing views and

experience that would have made the data richer. The sample size was limited as it was not led by G-Power and therefore the results cannot be generalised. The results were based on the participant's recollection and subjective memory of their past and current behaviours and therefore, participants might have been subjected to recall bias. Due to limited resources, there has been no data triangulation such as qualitative surveys, interviews or focus groups to understand deeper how and why there was the change in their fitness behaviours.

In conclusion, this study shows that COVID-19 did leave an impact on fitness behaviours amongst a sample of the Maltese population. The change was noted in exercise frequency, which increased, and a decrease in exercise intensity and water consumption. Further studies are suggested to provide an understanding as to why fitness behaviour differed with the impact of the COVID-19

pandemic. This will help prepare better guidelines for future limitations on fitness behaviours.

SUMMARY BOX

What is already known about this subject:

- Exercise improves people's lifestyle and overall health
- COVID-19 impacted people's health behaviours, suggesting poorer health

What are the new findings:

- Maltese participants exercised more during the COVID-19 pandemic as opposed to six months before.
- Maltese participants' level of exercise intensity decreased during the COVID-19 pandemic.
- Maltese participants drank less water during the COVID-19 pandemic as opposed to six months before.

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