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INFLUENCE OF COVID-19 GLOBAL CRISIS ON MENTAL AND BEHAVIOURAL CHANGES IN INDIVIDUALS BETWEEN AGES 65-70 AND IT'S PROBABLE LONG-TERM IMPACT ON THE FUTURE AT A LEVEL OF CLINICAL SIGNIFICANCE

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ABSTRACT

In the span of two decades, the world has witnessed three highly pathogenic and fatal coronaviruses transmissible to humans, they are the SARS-CoV, MERS-CoV and SARS-CoV-2 (COVID-19) out of which the latter has infected millions worldwide and has spread rapidly to many parts of the world considering its predecessors. The Impacts of COVID-19 has influenced many sectors of Society may it be health wise or economically. Among the numerous strata's of society the elderly have been categorized as the most vulnerable group economically and health wise. This research has used a web-based questionnaire, which was circulated among a limited group of 65 individuals in order to probe into the changes in the lifestyles of the elderly between the ages of 65-70 due to COVID-19 lockdowns, control measures and restrictions and their far reaching effects and consequences on this age group, in a clinical aspect, predicting the possible future diseases and consequences of COVID-19 mitigating measures, with the support of peer reviewed journal articles and responses received via the web-based questionnaire. The effects were analysed along two main aspects namely, mental and behavioural, using 5 parameters under each category stand in order to understand the future clinical aspects that can be anticipated upon classifying the data obtained into percentages and graphs. As most of the information on the far-reaching consequences of COVID-19 are yet to be fully understood, using this data preventative measures could be enforced in order to prevent premature death and many neurological diseases.

Keywords: SARS-CoV-2,COVID-19, Lock-down, Elderly, Consequences

INTRODUCTION

The current outbreak of Corona-virus Disease 2019 or COVID-19 giving rise to the novel coronavirus-infected pneumonia (NCIP) was first diagnosed as a few cases of viral pneumonia of unknown etiology in Wuhan city of Hubei province, a major transport and logistics hub, on the 29th of December 2019 (Ali et al.,2020). Thereafter, on the 11th of February 2020, with the increasing number of cases worldwide, virus was officially named as severe acute respiratory syndrome (SARS-CoV-2) by the International Committee of Taxonomy of Viruses due to its phylogenic relationship with the coronavirus which resulted the SARS outbreak in 2003 (Wang et al., 2021). Coronaviruses belong to the Coronavinae family and order Nidovirales and are enveloped RNA viruses which have been spread throughout the world by a considerably large but undetermined group of animal species, Their size usually varies from 60nm-140nm in diameter and they consist of spikes on the surface thereby giving the illusion of a crown hence giving way to the name coronavirus (Zhang et al.,2020).

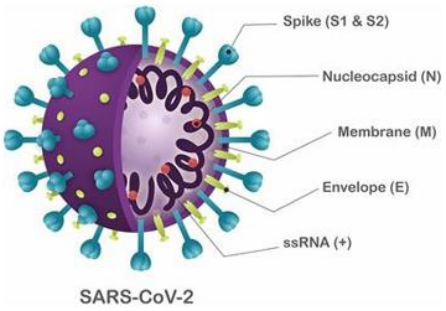


Figure 1: Structure of SARS-CoV-2 (Santos et al., 2020).

They are composed of four genera alpha, beta delta and gamma, until recently six human-coronaviruses (HCoVs) were identified as responsible for respiratory diseases, of which HCoV–229E, OC43, NL63, and HKU1 are globally endemic resulting in 10-30% of upper respiratory illnesses (Shereen et al.,2020). The remaining two, Severe Acute Respiratory syndrome coronavirus (SARS-CoV) and Middle East Respiratory Syndrome coronavirus affected the lower-respiratory tract and were of β-subtype similar to SARS-CoV-2, coronaviruses were initially thought to only affect animals till the SARS-CoV outbreak in 2002 and consequent MERS-CoV-2 in 2012 (Guarner,2020). Among the four genera, α and β-coronaviruses are highlighted due to their ability to cross the human-animal barrier and precipitate as major-pathogens, the lethal SARS-CoV first emerged from Guandong province, China in 2002 the last case seen in 2004 while MERS-CoV emerged in Jordan in 2012 with intermittent infections last recorded in 2020 (Zhu et al,2020). HCoV outbreaks occur due to human-animal interactions, this can be seen with the emergence of both SARS-CoV-1 and 2 in Guandong wild- animal market and Huanan live –sea market respectively, initially thought to be originated in Hipposideros bats they transmit to humans via intermediary hosts (Gilbert,2020). Intermediary hosts of SARS-CoV-1 were suspected to be palm civet cats while dromedary camels were suspected in MERS-CoV, the mortality rates were 11% and 34% respectively, in SARS-CoV-2 pangolins are perceived as the intermediary hosts while mortality rates are yet soaring(Singhal,2020). Figure 2 shows the origin of HCoVs in bats and transmission,

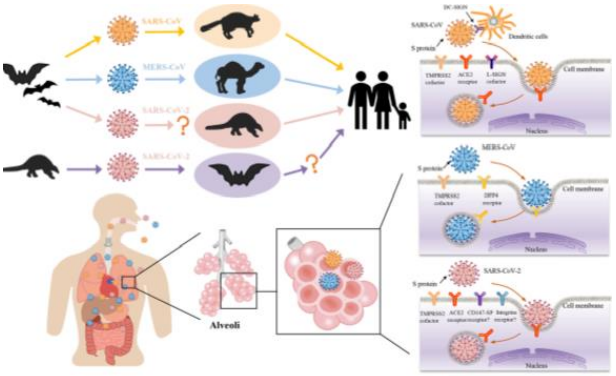


Figure 2-The potential hosts, bio-distribution and host cell-receptors of SARS-CoV-1, MERS-CoV and SARS-CoV-2 (Zhu *et al*., 2020).

Therefore, as of July 2021 COVID-19 had caused 4.2 million deaths while indirectly resulting in a total of 6.93 million deaths globally, a large portion of

which could be attributed to patients with Alzheimer's and heart diseases (Dyer,2021; Karlinsky and Kobak,2021). Another portion of the indirect deaths were related due to delayed seeking of medical healthcare services due to fear of contracting the virus especially in people suffering from chronic diseases, Age too has played a giant role in covid mortality as mortality from both direct and indirect causes has been highest in the older population, in the US alone 80% of COVID-19 deaths had been attributed to the people above 65 years of age (Sepulveda-Loyola,2020; Udalova,2021). As many of the elderly possess co-morbidities and underlying medical conditions such as Emphysema, Diabetes and Chronic Bronchitis contracting the virus could be fatal to them, Their highlighted vulnerability has fuelled isolation of older adults may it be in care homes, in families or independently (Sornette et al.,2020). While this isolation has helped to mitigate the spread of COVID-19 it has also led the elderly towards anxiety and depression, which in turn could give rise to complications such as cardiovascular, neurocognitive, autoimmune and mental health disorders (Armitage and Nellums,2020).

Sri lanka intermittently faces epidemic infections that cause morbidity and mortality such as Dengue and Leptospirosis and occasional bouts of influenza and other respiratory diseases and had been reprieved of the earlier lethal SARS-CoV and MERS-CoV until COVID-19 was first detected on 10th March 2020 in a native (Wickramaarachchi, Perera and Jayasinghe, 2020). With the increasing caseload a prompt nationwide lockdown was imposed on the 20th March 2020 continuing till partial relaxation on 11th May 2020 by the Sri Lankan Government, the main control strategy involved minimizing human mobility by parametrizing contact rate and inter-regional travel (Erandi et al.,2020).

The analysis carried on about the changes in lifestyle patterns of the elderly between 65-70 years in SL throughout imposed lockdowns was mainly focused on behavioural and mental impacts further elaborated under following parameters,

Table 1- Parameters under which investigations were carried out

Behavioural Parameters	**Mental parameters**
Eating Habits	Anxiety
Sleep	Depression
Physical Activity	Emotional
Weight Management	Threat Perception
Socialization	Self-Concept

The following diagram indicates the dark impacts of the above control measures to the elderly population along the above parameters,

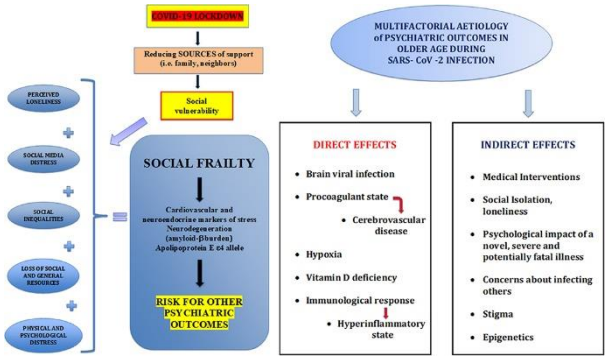


Figure 3- Social Frailty in Adults as a consequence of COVID-19 lockdown (Lozupone et al., 2020).

Throughout earlier epidemics SL hadn't used such restricting measures yet with the entire population at risk, the elderly more vulnerable , these necessary measures have resulted unparalleled fear and uncertainity, though fear is an adaptive response to threats the inability to cope with the heightening danger can spark defense responses in the elderly (Bavel et al.,2020). The repercussions of Fear aren't limited to death but a myriad of spheres such as family,social isolation and economic consequences resulting anxiety, depression, stigmatization and paranoia (Ahorsu et al.,2020). Thus this study will elaborate on the current and future clinical outcomes due to changes of lifestyle during COVID-19 lockdowns on both the mental and behavioral aspects.

Objectives:

Primary objective

• To understand the influence of COVID-19 global crisis on mental and behavioural changes in individuals between ages 65-70 and its probable long-term impact on the future at a level of clinical significance

Specific objectives

• To understand the extent of vulnerability of older adults due to isolation during COVID-19 pandemic

• To understand to which extent a source of dependence affects in maintaining the mental health of older adults

• To identify future complications that arise due to change of lifestyle patterns of older adults during COVID-19 pandemic

Materials

A web-based questionnaire was circulated through various channels of society to get relevant details through the means of a questionnaire inquiring the impact/influence of COVID-19 in the lifestyle of the elderly both mentally and behaviourally through 20 questions designed to analyse 10 parameters of the lifestyle, this questionnaire was done using Google forms. The responses which were obtained via circulation through WhatsApp and Viber social media were then drawn into graphs using MS Excel and conclusions were arrived upon, according to data obtained parameter-wise. In addition 2 extra questions were asked inquiring about further information and chronic diseases participants were suffering from

The link to the questionnaire which was used in the research is given below,

https://docs.google.com/forms/d/e/1FAIpQLSckhRqy_4NrShi3xVxc8PyWxFGELvBpHN96BREEmkuEvo6f5w/viewform?usp=sf_link .

METHODOLOGY

The following questionnaire was circulated via numerous channels such as WhatsApp, Viber among the elderly in order to obtain the necessary data, the questionnaire will cover parameters needed to analyse the influence of COVID-19 on their lifestyle patterns and a general scheme of 5 answer keys common to all questions in a multiple-choice setting, the answer keys were Yes, No, Not much, Greatly changed and No change were used to answer the questions, the parameters shown in the introduction were covered by each question as shown in Table 2 below, and long- lasting clinical impacts that will result in the future were arrived upon based on results of the survey and the reference of relevant literature.

Table 2- Questions and parameters

Question No	Parameter	Question
01	Weight Management	Age above 70 or between 65-70
	Threat Perception	
02	Physical Activity	Gender (Female or Male)
	Emotional	
03	Depression	Has your living status changed? Do you live alone?
04	Emotional	Are you married? Has it changed during COVID-19 period?
05	Anxiety	Are you financially independent?
06	Anxiety	Have you felt financial strain due to COVID-19?
07	Emotional	Have you access to a phone or a digital device?
08	Self-concept	Have you found any difficulty with online services? (marketing, medicine, reloading etc.)
09	Threat perception	Did you step out of the house to fulfil any of the above needs for about 3 months or since restrictions were taken off?
10	Depression	Have you felt loneliness during this pandemic period?
11	Self-concept	Do you feel aged beyond your years or younger due to this pandemic?
12	Threat perception	How scared have you felt due to the situation in the country/ how can you rate your level of fear due to covid-19 compared to a common cold or flu
13	Sleep	Have your sleeping patterns been normal during the covid-19 time period
14	Sleep	If it has been affected to which extent? has it been more hours
15	Social	Have your social engagement been the same as that before the pandemic or reduced
16	Social	Have you kept contact friend or family recently? (2 weeks' time span)
17	Weight Management	Has your (weight / eating/ no. of meals) increased during the pandemic?
	Eating Habits	
18	Physical Activity	How can you rate your physical activity from before the pandemic and now?

19	Threat perception	Do you have a chronic disease (Diabetes, hypertension, cardiovascular disease? If yes has the condition been affected due to the pandemic
20	Eating Habit	Has your carbohydrate or lipid intake been high during this period

RESULTS

Results across each parameter was tabled then, incorporated into graphs in order to bring to light the implications of COVID-19 pandemic on health of older adults aged between 65-70 years.

Table 3- The No. of responses received to each question

Question	Parameter	Total No. of Responses	Age Between 65-7- Yrs	Age Over 70
01	Weight Management	65	49	16
	Threat Perception			
Question	Parameter	Total No. Of Responses	Female	Male
02	Physical	49	34	15
	Emotional			

3) Living status (alone or with family)-

Question	Parameter	Total No. Of Responses	Yes	No	Not Much	Greatly Changed	No Change
03	Depression	49	14	19	7	5	4

4) Are you Married? Has it changed during COVID-19?

Question	Parameter	Total No. Of Responses	Yes	No	Not Much	Greatly Changed	No Change
04	Emotional	49	23	13	3	5	5

5) Is your source of income independent or dependent

Question	Parameter	Total No. Of Responses	Yes	No	Not Much	Greatly Changed	No Change
05	Anxiety	49	27	11	7	3	1

6) Have you felt strained financially

Question	Parameter	Total No. Of Responses	Yes	No	Not Much	Greatly Changed	No Change
06	Anxiety	49	19	13	12	3	2

7) Have you any access to a phone or any digital device?

Question	Parameter	Total No. Of Responses	Yes	No	Not Much	Greatly Changed	No Change
07	Emotional	49	39	3	3	3	1

8) Have you found any difficulty with online services? (Marketing, medicine, reloading etc.)

Question	Parameter	Total No. Of Responses	Yes	No	Not Much	Greatly Changed	No Change
08	Self Concept	49	17	14	12	4	1

9) Did you step out of the house to fulfil any of the above needs for about 3 months or since restrictions were taken off?

Question	Parameter	Total No. Of Responses	Yes	No	Not Much	Greatly Changed	No Change
09	Threat Perception	49	21	17	7	3	1

10) Have you felt loneliness during this pandemic period?

Question	Parameter	Total No. Of Responses	Yes	No	Not Much	Greatly Changed	No Change
10	Depression	49	29	8	7	3	2

11) Do you feel aged beyond your years or younger due to this pandemic?

Question	Parameter	Total No. Of Responses	Yes	No	Not Much	Greatly Changed	No Change
11	Self Concept	49	16	15	11	3	4

12) How scared have you felt due to the situation in the country/ how can you rate your level of fear due to covid-19 compared to a common cold or flu?

Question	Parameter	Total No. Of Responses	Yes	No	Not Much	Greatly Changed	No Change
12	Threat Perception	49	22	1	9	17	0

13) Have your sleeping patterns been normal during the covid-19 time period?

Question	Parameter	Total No. Of Responses	Yes	No	Not Much	Greatly Changed	No Change
13	Sleep	49	27	8	6	4	4

14) If it has been affected to which extent? has it been more hours

Question	Parameter	Total No. Of Responses	Yes	No	Not Much	Greatly Changed	No Change
14	Sleep	49	29	9	5	4	0

15) Have your social engagement been the same as that before the pandemic or reduced

Question	Parameter	Total No. Of Responses	Yes	No	Not Much	Greatly Changed	No Change
15	Social	49	27	8	6	6	2

16) Have you kept contact with friends or family recently? (2 week time span)

Question	Parameter	Total No. Of Responses	Yes	No	Not Much	Greatly Changed	No Change
16	Social	49	28	9	7	4	1

17) Has your (weight / eating/ no. of meals) increased during the pandemic?

Question	Parameter	Total No. Of Responses	Yes	No	Not Much	Greatly Changed	No Change
17	Weight Management Eating Habits	49	27	12	5	4	3

18) How can you rate your physical activity from before the pandemic and now

Question	Parameter	Total No. Of Responses	Yes	No	Not Much	Greatly Changed	No Change
18	Physical Activity	49	2	3	19	16	9

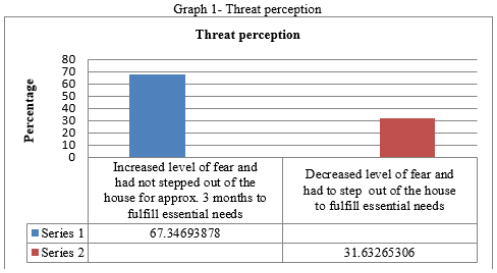
19) Do you have a chronic disease (Diabetes, hypertension, cardiovascular disease? If yes has the condition been affected due to the pandemic?

Question	Parameter	Total No. Of Responses	Yes	No	Not Much	Greatly Changed	No Change
19	Threat Perception	49	25	14	4	4	2

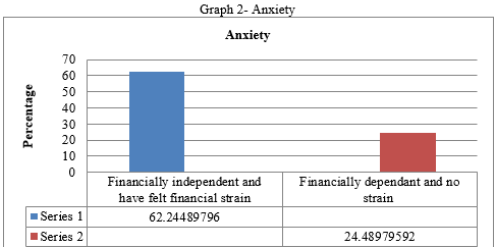
20) Has your carbohydrate or lipid intake been high during this period?

Question	Parameter	Total No. Of Responses	Yes	No	Not Much	Greatly Changed	No Change
20	Eating Habit	49	25	9	10	4	1

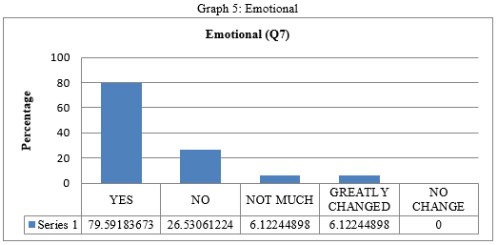
Graph 1- Threat perception



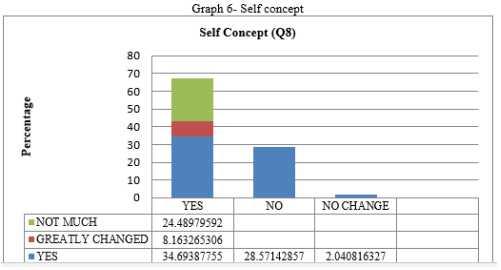
Graph 2- Anxiety



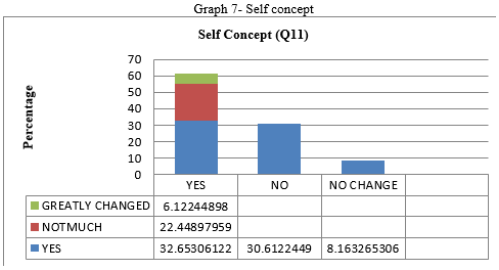
Graph 5: Emotional



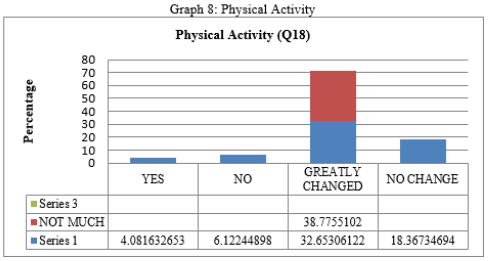
Graph 6- Self concept



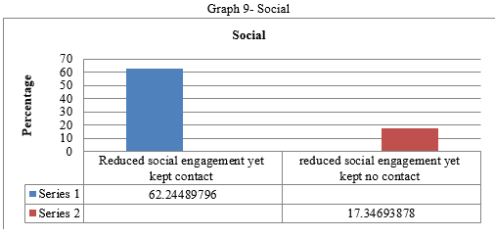
Graph 7- Self concept



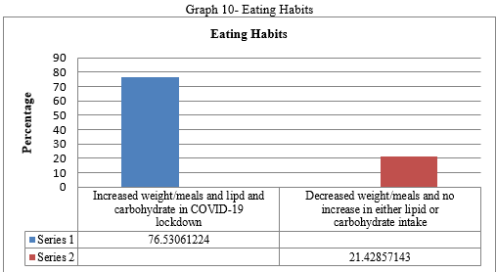
Graph 8: Physical Activity



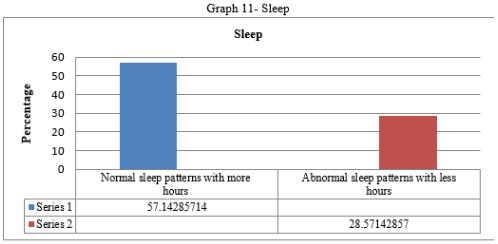
Graph 9- Social



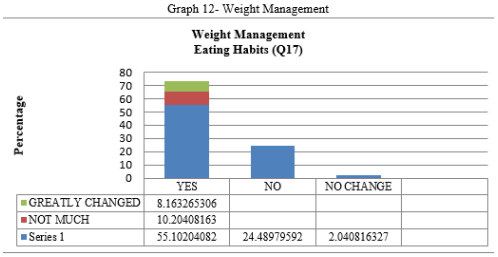
Graph 10- Eating Habits



Graph 11- Sleep

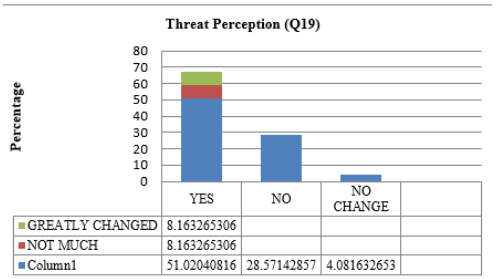


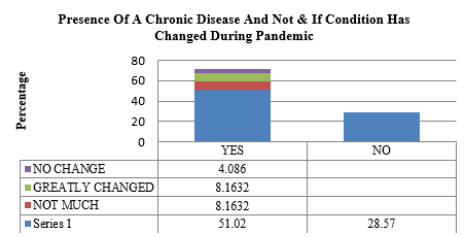
Graph 12- Weight Management



DISCUSSION

The adverse impact due to the virus and control measures taken to prevent the spreading of disease has not been limited to the elderly its widespread repercussions can be seen throughout all age groups from children to adults globally (Augeraud-Veron,2020). Nationwide confinement restrictions enforced in many countries resulted abrupt changes in social events, physical activities, eating habits, lifestyle (Ammar et al.,2020). Meanwhile enormous surges of infections have induced panic and fear which are further promoted by social media and the press and can lead to avoidance, reactance, and detrimental behaviour (Constant et al.,2020). Thus, the fatality rate and higher transmission in elderly, especially in those with underlying diseases have garnered profound changes in their lifestyles, but these control-measures may result long-term hindrances/diseases that are directly or indirectly psychological, physiological, or social pervasively now or in the future (Kasar and Karamen, 2021; Siette et al.,2021). This can be well observed as question 19 investigates about chronic diseases and changes in them during the pandemic lockdowns to which the responses were as shown below in Q19 graph below, while the first graph is raw data the latter graph is the processed form.





This indicates that 71.4% of participants had an underlying chronic disease, this agrees with the normal prevalence of chronic diseases in older adults which is usually 87% in middle income countries (Heerden et al.,2017). COVID-19 could well bring-about worsening of pre-existing conditions or new developments as can be observed in more than 50% of participants. Hence this can result in heightened fear in them paving way to anxiety disorders, as older-adults are generally considered more vulnerable due to compromised immunity, chronic diseases thus the imposed restrictive-measures can hinder doctor's visits, create feelings of being less prioritized and their highlighted vulnerability in media, newspapers and articles and 80% of total fatality cases being between 60-65 years can increase threat perception , and increased anxiety (Parlapani et al., 2020; Yan et al.,2020). A recent article emphasized the development of moderate to severe anxiety in approximately 84.5% individuals above 60years due to above threats perceived, anxiety could also be due to inability of fulfilling essential needs due to cocooning by governments and technological inaptitude (Malesza and Kaczmarek ,2021; Parlapani et al.,2020).

Generally, Vitamin-D deficiency is prevalent among older adults as their vit-D3 production is 75% decreased compared with youngsters due to renal-function impairment, yet increased COVID-19 risk perception has currently limited their ventures outside as shown in graph 1, even while fulfilling essential needs thus this has further reduced vitamin-D levels (Christides,2018). With regards to COVID-19 sufficient Vit-D can reduce risk of potential infections via defence mechanisms reducing viral replication while reducing severity of pneumonia caused by it, while in general terms it's associated with reducing risk cardiovascular-diseases, ischemic heart-diseases, and early death and multi morbidity (O'Shea et al.,2020; Palmer et al., 2020).

Anxiety by definition is an emotion distinguished by internal feelings pertaining to tension and worry, which can result along physical attributes like sweating and increased heartrates (American Psychological Association,2021; Han, Mahendran and Yu,2021). In the graph 2 independent older adults seemed to face more financial anxiety due to decreases in interest-percentages in banks and reduction of rents, some of the most common income-methods among them, this can be observed in the figure 3 below,

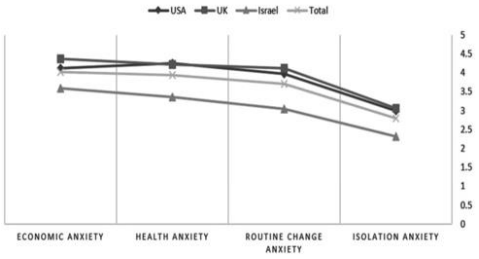


Figure 4: High Economic anxiety due to covid-19 (Bareket-Bojmel, Shahar and Margalit, 2020).

The financial anxiety of the 49 participants of this survey is as in graph 2, thus this can result in depression as can be evidenced by figure 4,

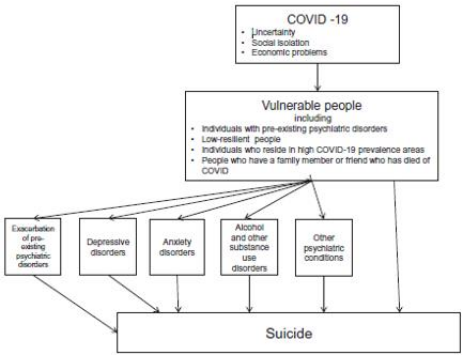


Figure 5: Development of anxiety related disorders such as paranoia and depression in the general population (Sher, 2020).

Depression has been cited as one of the most common side effects of COVD-19 and can be seen in more vulnerable ages of 65-70 as this category was the most hard hit due to pandemic lockdowns and prolonged depression can lead to suicide or more injurious outcomes (Armitage and Nellums,2020; Brenner and Bhugra,2020). Depression levels in society had increased by 7% in the general populations with respect to before the pandemic, thus COVID-19 might cause a parallel epidemic in the near future resulting more fatalities (Banerjee, 2020; Wand et al., 2020). Anxiety can also result in another major disorder known as paranoia/ paranoid ideation, these individuals are inclined to misinterpret information and construct friendly advice as hostile/ disapproving, and can show reckless regard for regulations, but this could be either underestimation or exaggeration of the risk (Lazzari et al.,2020; WHO, 2020).

As stated above depression during times of pandemic could be anxiety related, but depression could result a plethora of other diseases not withstanding suicidal ideation as shown in the graph 3, according to responses in the depression parameter, only 27.5 % of participants felt no loneliness and lived in the midst of family, but majority of participants, 56% felt different degrees of loneliness and separation during the COVID-19 pandemic. It has already proven elderly with no family are at higher risks of anxiety and depression as most of their social contact is disconnected (Conejero et al.,2020). This is a enormous psychological and emotional impact to them and while aggravating depression could result long-term consequences such as Alzheimer's Disease (AD) and bolster internal Ageism (Bavel et al., 2020; Vale et al.,2020). The era of COVID-19 has spotlighted ageism and age-stereotyping engrained in society, by attitudes and responses of public concerning the value of elderly lives via actions of governments, hospitals and media this has contributed to exacerbated internal and external aging in elderly leading to premature death (Howell, Galucia and Swinford,2020). The loneliness and mental-health burden imposed may also worsen pre-existing Alzheimer's Disease while also contributing to the predicted increase of Alzheimer's in the future (Carnes et al.,2020). While Alzheimer's is genetic 70% in manifestation an association with depression is another known cause for AD, as has been observed among bereaving widows therefore, depression is a major risk factor for

developing AD at advanced life-stages (Silva et al.,2019).

The emotional impacts of COVID-19 are myriad yet the responses received herein were as follows, as many were confirmed as living separated from families a marriage-based question garnered the graph 4,

In this context 10% of participants had faced separation from spouses during the pandemic and this in turn can lead to developing neurodegenerative diseases such as Parkinson's Disease PD is characterized by bradykinesia, resting tremors etc and is closely related to psychological stress (PS), such as that from losing a spouse, PS release dopamine and glutamate which can also be neurotoxic thereby increasing risk of PD (Rod et al., 2011; Vlainjinac et al.,2012).

Thereby increasing societal burden and decreasing quality-of-life.

Frailty syndrome is another emotional and self-concept related impact of COVID-19 as shown in both graphs 5 and 6,

According to Q7 75.59% of the elderly had access to a digital device while 26.53 had not, yet in Q8 67.24% of them had difficulty managing or using them to fulfil daily needs. In India alone 25-30% adults over have been technologically active compared to 6-8% earlier, with guidance while initially feelings of being useless arose with the technological incompetency's and is still festering in majority of 65–70-year-olds (Sinha, Verma and Tiwari, 2021). The frailty-compass arose further with ageism in social media such as #BoomerRemover tag (Celis, 2020).

Q11 inquired of the feeling of being aged beyond physical years due to pandemic, the responses agreed of feeling aged in different degrees as in graph 7. The aged feeling due to social media and sedentary lifestyle devoid of physical/social activity can lead to increased loss of muscle mass rather than the normal 0.8% average annually due to decreased protein-synthesis and increased protein-degradation (Moro and Paoli,2020).

Considering Behavioural parameters, Physical activity has greatly declined as evidenced by the graph 8,

71.4% participants witness physical activity (PA) has greatly reduced. Thus reduced PA and sedentary-behaviour can increase risk of severe respiratory disease and result in functional disabilities in limb usage due to stiffness and muscle atrophy (Pavon, Baeza and Lavie, 2020). The Figure 6 highlights importance of PA,

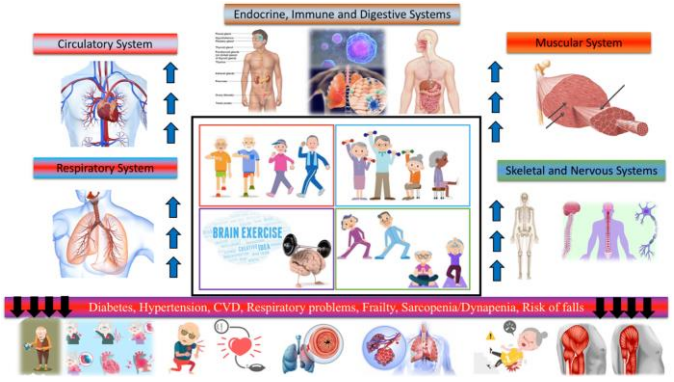
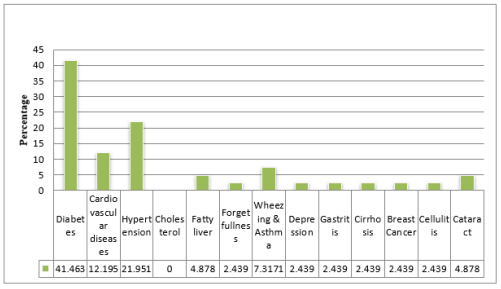


Figure 6: Risk of future diseases associated with physical inactivity (Pavon and Baeza, 2020)

Enforcement of lockdowns, curfews enhance social isolation among older-adults and is a definite public health concern as it heightens risk of cardiovascular, neurocognitive and mental health problems and will affect disproportionately on adults whose social contact is away from home (Armitage and Nellums,2020).

While 62.2% people maintained social contact in differing degrees, a worrying 17.34% have not maintained any contact according to graph 9. This could leave long-lasting impacts and increase risk of developing neurodegenerative disorders due to loneliness as discussed above and heighten prevalence of obesity in the future due to SB and PA resulted from reduced social engagement (Hall et al.,2020). Moreover, elderly in isolation are likelier to search reward and gratification associating food-intake to reduce physiological-stress via feeding-induced-satiety, this can lead to obesity which is expansion of adipose tissue and lead to sarcopenic –obesity, dangerously reduce immunity to infections including COVID-19, reduce functional-capacity of respiratory-system and difficult ventilation (Di-Renzo et al.,2020).



Currently half-a-billion people worldwide have diabetes yet due to dietary changes and eating patterns influenced by COVID-19 this can rise by 10.2% towards 2030 (Corrao et al.,2021).

Eating habits too have been seriously modified during COVID-19, while the younger generations have focused to healthier diets the elderly have remained the same, but COVID-19 control-measures have led to comfort-eating and frequent snacks and night-time consumption of junk food which are economical and accessible (Al-Mughamis, Al- Asfour and Mehmood,2020). Plasma cholesterol increases with age, especially in women and considering 240mg/dl the cut off at least 10% are affected by hypercholesteremia in the east while ranging up to 50% westwards (Felix-redondo et al.,2013). In the survey done as evidenced by graph 10,

76.5% participants of this survey attest to increases in meals and weight with high carbohydrate and lipid intake, increased lipid intake can affect with hypercholesteremia leading to cardiometabolic disorders and atherosclerosis (Banach et al., 2020). Increase of lipid with High-saturated-fatty diet may also be due to stress and anxiety pertaining to the situation (Chopra et al.,2020). Among participants of this survey the most prevalent condition was Diabetes currently, as can be seen in the graph Q21 below,

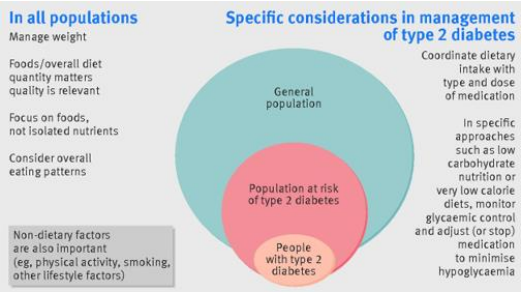


Figure 7: Dietary approaches to reduce risk of diabetes and worsening of pre-existing diabetes condition (Forouhi et al., 2018).

With regards to sleep the data is shown in graph 11, In a study done in China 35% of participants exhibited psychological distress and 34% of them had insomniac symptoms due to anxiety and fear and experienced sleep disturbances (Sher,2020). These statistics can relate to the 28.5% in referred graph. Slight changes in lifestyle of the elderly can heighten risk for dementia, during quarantine 70% of elders spent increased time lying down or sedentarily this promotes dementia due to cognitive declining due to reduced PA (Santo et al.,2020). This is evident as 57% of participants too increased hours of reduced PA by extending sleep-hours. Another consequence of excess sleep is osteoporosis/ osteo-sarcopenia which is age-related and cause progressive-decline of bone-muscle and is exacerbated by physical inactivity, COVID -19 has increased mortality of osteoporotic-hip fracture patients from 20% to 36% annually (Lim and Kurniawan,2021).

Weight Management in adults is another parameter where multiple changes occurred due to myriad impacts of COVID-19, referring to graph 12 obtained by this survey for question-17 and age of participants more than 70% had experienced weight increase in varying degrees. This along with other changes in lifestyle and chronic- diseases could lead to lead to impaired cardio-metabolic health which in turn results metabolic syndrome and dyslipidaemia (Saqib et al.,2020; Auriemma et al., 2021). This can further be observed in Figure 8,

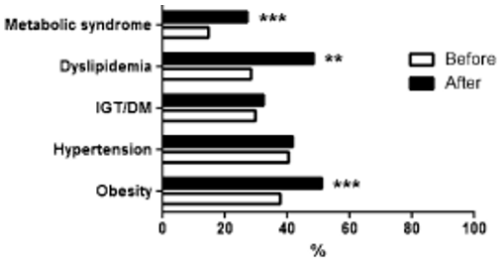


Figure 8: Prevalence of Metabolic syndrome and Dyslipidemia before and after the pandemic (Auriemma et al.,2021)

COVID-19 also manifested changes in eating disorders (ED) such as Anorexia and malnutrition too, studies show 38% of ED's were worsened, health anxiety and psychological stress have fuelled ED's (Bryan et al.,2020). Though this is not evident in the above survey it is a serious long-lasting consequence of COVID-19 pandemic.

CONCLUSION

The ongoing COVID-19 pandemic has lead to a massive loss of lfe and resulted unprecedented and unpredictable changes in both the economic and health sector, both of which in turn can cause widespread consequences in human lives, especially the elderly, therefore considering expected and received results of this survey and correlated diseases. It is important to educate people belonging to various age groups the future consequences that could take place due to unhealthy eating habits, lifestyle changes

etc. and take necessary precautions against them. Meanwhile to dissipate loneliness experienced by senior citizens, steps should be taken to enrich their lives via introduction to technology/ technological facilities during these times.

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