

SUMMER TRAINING REPORT

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PART 1

**WORK ASSIGNED BY FACULTY
MENTOR**

**REPERCUSSIONS OF STAY AT HOME ORDER ON PHYSICAL
ACTIVITIES AND SEDENTARY CULTURE IN DIFFERENT AGE
GROUPS DURING “COVID-19 LOCKDOWN”**

ACKNOWLEDGEMENT

*“The Road of Success Is Dotted with Many Tempting Places but Ultimately the Man Who Works
Hard Only Gets Success”*

Words put on paper are mere ink marks, but when they have a purpose there exist a thought behind them. I too have a purpose to express my gratitude towards those individuals without whose guidance the project would not have been possible.

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ABBREVIATIONS

C&A – Children and Adolescents

Covid-19 – Coronavirus 2019

PTSD – Post-traumatic Stress Syndrome

SARS-CoV-19 – Severe Acute Respiratory Syndrome – Coronavirus 19

TV - Television

WFH – Work from Home

WHO – World Health Organization

KEYWORDS: Covid-19, Lockdown, Physical activity, children, adults, older adults, physical health, school closure, stay at home, impact.

INTRODUCTION

In response to Covid-19 outbreak, almost the entire world went into lockdown, given the time period or occurrence being different or same. WHO declared SARS-CoV-19 as pandemic and all the nations underwent restrictions considering stay-at-home order. Like any other nation, the first step India took to fight the pandemic was to announce shutting down of workplaces (except a few central govt. organizations) and schools indefinitely. People were asked to stay at home and movement outside was strictly restricted.

Any and every individual follows a routine in his/her daily life, people go to work, children go to school and colleges, elderly have their post-retirement routine, etc. People don't realize but they have a sequence of activities or habits regularly followed. Some active individuals follow a strict workout/gym routine and even the less active individuals have a schedule even if working out is or is not a part of their routine.

When people are suddenly taken out of their routine and asked to just stay at home for an indefinite period, their routine, habits, mind and bodies are disturbed. Any sudden change is a shift from their comfort zone to a different dimension which eventually starts affecting the body and mind.

DEFINITION OF PHYSICAL ACTIVITY BY WHO

"Physical Activity (PA) is defined as any bodily movement produced by skeletal muscles that require energy expenditure." There are two components to physical activity that need to be considered -

- **Aerobic fitness:** this usually includes moderate to vigorous activity that makes you feel a bit warm and causes an increase in your breathing rate, breathing depth and your heart rate.
- **Strength and balance:** This is often the forgotten component of physical activity but it is an essential part and has many benefits.

During the COVID-19 pandemic it is much progressively significant for all individuals to be truly dynamic. Regardless of whether it is just a brief break from sitting at your work area and doing some walking or stretching. Doing something as simple as this will:

- Ease muscle strain
- Relief mental tension
- Improve blood circulation
- Improve muscle activity
- Create some routine to your day in these unprecedented times

THE IMPORTANCE OF PHYSICAL ACTIVITY DURING THE COVID-19 PANDEMIC (suggested by WHO)

In light of the current situation worldwide, certain benefits of physical activity may be specifically pertinent to the COVID-19 Pandemic. These benefits are:

- Physical activity enhances immune function and reduces inflammation therefore it could reduce the severity of infections.
- Physical activity improves common chronic conditions that increase the risk for severe COVID-19 (i.e. Cardiovascular Disease, Diabetes).
- Physical activity is a great stress management tool by reducing symptoms of anxiety and depression.
- Physical activity helps bring cortisol levels in balance. Stress and distress (such as during a pandemic) create an imbalance in cortisol levels and this negatively influences immune function and inflammation.

Age is a big demographic constraint in all the studies. So in order to identify effect of lockdown on physical activities of individuals, it's important to classify them in different age groups as the energy levels and routine differs according to age.

SCHOOL GOING CHILDREN

As we talk about the influential property of lockdown on individuals, one of all immensely affected categories is school going children. A child adapts going to school at a very small age and realizes that going to school is part of his/her life. In the school age, a child has a broader vision, a perspective mind and an astonishingly high energy level. **The Telegraph, UK published an article that states** "Children have energy levels greater than endurance athletes." It was found that children not only have fatigue-resistant muscles but recover very quickly from high-intensity exercise - even faster than the well-trained adult endurance athletes. Schools being closed and implementation of stay at

home order has restricted their physical activity and energy usage levels leading to sedentary lifestyle, mental boredom, reduced brain activity and, excessive use of internet, TV etc.

School is not just a place where a child is supposed to get education and good grades. It is one of a major foundation stone that creates the base of children's future where they learn important life lessons, morals and explore their area of interest. At such age, children who are acclimated with going to class and blending with companions each day will be the significant victims of emotional well-being issues since they are limited at their homes at the ready period of learning social abilities of their lives. For many, the home is not a happy place, where there is a lingering threat of an unhappy and dysfunctional household. For them, their school, the safe haven, is no longer a place where they can be happy and be with friends.

ADULTS (18-64 AGE)

Due to being confined at home, physical activity behavior of adults has also affected tremendously. Going for work every day and household chores is a part of an adult's routine physical activity. WFH individuals spend most of their time sitting and working on a computer/laptop. Whereas, people with no jobs or lack of work due to lockdown suffer from sedentary lifestyle and boredom. Managing kids at home, excess work, household chores are different activities this age group follows. People having children below 5 years of age and no help in lockdown are facing a huge problem managing kids and work under the same roof. Following an exercise/workout routine is commonly seen in adults. However, living at home has made this quite difficult for most whereas some found time from their busy routine to actually focus on health.

ELDERLY (65 & ABOVE)

As we know, Older adults are the most susceptible to covid-19 infection so it became very important for them to socially distance from others. They usually tend to participate in group physical activities, walking in the park, etc which got difficult to practice during lockdown.

The impact of a sedentary lifestyle might be lower for kids and youthful grown-ups, but is far more severe for older adults. Although people of this age group need to stay at home because they have a

higher risk of coronavirus disease (COVID-19), what they need is to avoid a sedentary lifestyle. Physical movement is even more significant in older adults, particularly to keep up their independence, psychological wellness, and prosperity. Maintaining mobility in older age is fundamental, as sedentarism may lead to loss of independence in older adults.

Physical idleness among elderly is the fourth most elevated hazard factor for mortality worldwide and a significant contributor to disability. Among individuals who don't take part in ordinary physical activities, the danger of decrease in functional ability is higher. Keeping up versatility in mature age is hence vital, as it might foresee the loss of autonomy in more established grown-ups. Inadequate physical movement during the lockdown period can thus affect the psychological and physical strength of older adults.

OBJECTIVES

- 1) To assess the impact on physical activities in school going children due to Covid-19 lockdown
- 2) To assess the impact on physical activities in adults due to Covid-19 lockdown
- 3) To assess the impact on physical activities in elderly due to Covid-19 lockdown

RESEARCH METHODOLOGY

STUDY DESIGN:

- Integrative Literature Review

STUDY POPULATION:

- Age groups – School going C&A (0-17), Adults (18-64) and elderly/older adults(65&above)

STUDY DURATION:

- June 8, 2020 – June 25, 2020

METHODOLOGICAL APPROACH

- A review was conducted and researches panning over a period of Covid-19 occurrence were studied. A total of 70 researches and articles were studied, out of which 35 were on Children, 25 were on Adults and 10 were on elderly. 30 studies were considered, 11 of Children, 11 on adults and 8 on elderly.

INCLUSION CRITERIA:

- 1) Studies related to physical activities and sedentary lifestyle of given age groups concerning Covid-19 lockdown period.

- 2) Also, studies including recommendations on the same.
- 3) Published articles stating problems faced by people of the given age groups in their routine and physical movement.

EXCLUSION CRITERIA:

- 1) Studies that only talked about mental health
- 2) Studies not in period of Covid-19 or has no relation to it.
- 3) Studies that were unavailable in full text or were in other languages.

SEARCH METHODS

- Search terms identifying physical activity and sedentary lifestyle were trialed and the accompanying inquiry terms were created: truncations "lockdown" joined with "physical activity OR sedentary lifestyle" (truncated) and "impact OR effect" (truncated) “age groups” “adults” “children” “Older adults” utilizing the Boolean administrator "AND".
- Literature collection was done using Google scholars, Medline, Pub-med, Research gate online platforms.

LITERATURE REVIEW

SN o.	TITLE	AUTHOR NAME	COUNTRY	YEAR	STUDY DESIGN	POPULATION	OBJECTIVE	METHODOLOGY	FINDINGS/OUTCOME
1	Impact of Coronavirus Imposed Lockdown on Indian Population and their Habits	Mahendra Kumar, Sachin Dwivedi	India	2020	Cross-sectional, observational study	People in the 18-40 years of the age group who live in their homes due to COVID-19 lockdown.	To assess the impact of lockdown on individuals' daily habits such as sleep/got up, social media use, work from home and more selected variables.	Sampling technique: Probability systematic sampling technique. Sample Size: 749 Study tool: A self-prepared semi-structured anonymous questionnaire was used to record the responses of participants.	1) The results of responses about work from home 55% participants are working from home since lockdown condition implementation. 2) Routine habits 3) Since lockdown 40 % of participants agreed to use more internet data on official work and 31% of participants use internet data more than usual to access social media since lockdown. 4) Change in eating, sleeping etc habits.
2	Eating habits and lifestyle changes during COVID-19 lockdown: an Italian survey	Di Renzo, L., Gualtieri, P., Pivari, F. <i>et al.</i>	Italy	2020	Cross-sectional, observational study	Italian internet users.(Entire Italy)	To investigate the immediate impact of the COVID-19 pandemic on eating habits and lifestyle changes among the Italian population aged ≥ 12 years.	Sampling technique: Probabilistic sampling technique. Sample Size: 4500 Study tool: The survey was conducted from the 5th to the 24th of April 2020, among the Italian population, by using an online platform, accessible through any device with an Internet connection.	1) Smoking habits reduced and sleep hours increased. 2) Variation in food intake. 3) Physical activities/training : gym was the preference before lockdown which changed to home workout without weights during lockdown.

3	Effect of lockdown on activities of daily living in built environment and well-being	Sudhir Kumar Pasala, Lakshmi Gumpeny, Madhu Kosuri, Snehalatha Tippana, Sridhar Gumpeny	India	2020	Cross-sectional, observational study	NA	To assess how personal built environment affected the citizens in the first few weeks	Sample Size: 121 Study tool: The survey was administered online from 19th April 2020 to 07th May 2020, i.e. during and beyond 4 days of the second phase of lockdown.	1) Forced social isolation did not alter the television channels that were viewed. 2) Among those who worked from home, most preferred to work from their bedroom. 3) There was no change in the quality or quantity of sleep during the lockdown. This study in the early weeks of the lockdown documents the way in which individuals lived through it in terms of the built environment at home.
4	A Study of Effect of Corona Virus Covid-19 and Lock Down on Human Psychology of Pune City Region	Rahul Suryawanshi, Vishlesha More	India	2020	Cross-sectional, observational study	Residents of Pune	(i) To study the human psychology in Lock Down period (ii) To study how people spending their time in Lock Down Period (iii) To Study the impact of Lock Down on their family relations.	PERIOD OF STUDY: First 6 days of Lock Down and Janata Curfew Period i.e. 22nd March to 27th March, 2020 of the selected region, Pune City. SAMPLING TECHNIQUES: Sampling Technique is used is Convenient Sampling Technique. SAMPLE OF STUDY: People who are resident of Pune City region. SOURCES OF DATA COLLECTION: The data is a primary data. The data is obtained through questionnaire framed in Google form sent to selected people.	1) The Lock Down have given the positive effect on 54 respondents, Negative impact on 11 respondents and there is no effect on their mentality is 30 out of 95. 2) it is found that most of the people spending their time with the family and then watching Television then Mobile phones. But major respondent gave their choice as spending time with family. 3) 62 respondents said their relation improved, only 2 respondent noted their relation is worsen and 31 respondent noted there is no effect on their relation out of 95.

5	Behavioural change towards reduced intensity physical activity is disproportionately prevalent among adults with serious health issues or self-perception of high risk during the UK COVID-19 lockdown	Nina Trivedy Rogers, Naomi Waterlow, Hannah Brindle, Luisa Enria, Rosalind M Eggo, Shelley Lees & Chrissy Roberts	UK	2020	Cross-sectional, observational study	Residents of UK	To examine whether the UK's lockdown measures have had disproportionate impacts on intensity of physical activity in groups who are, or who perceive themselves to be, at heightened risk from COVID-19.	Sampling technique: Probabilistic sampling technique. Sample Size: 5820 Study tool: The survey of adults aged over 20 was conducted from the 6th to the 22th of April 2020, roughly mapping to 3-5 weeks of lockdown in the UK, survey data were collected by using an online platform, accessible through any device with an Internet connection using a 'daisy-chaining' approach.	Most (60%) participants achieved the same level of intensity of physical activity during the lockdown as before the epidemic. Doing less intensive physical activity during the lockdown was associated with obesity (OR 1.21, 95% CI 1.02-1.41), hypertension (OR 1.52, 1.33-1.71), lung disease (OR 1.31, 1.13-1.49), depression (OR 2.02, 1.82-2.22) and disability (OR 2.34, 1.99-2.69). Participants who reduced their physical activity intensity also had higher odds of being females, living alone or having no garden, and more commonly expressed sentiments about personal or household risks in narratives on coping.
6	Prevalence of Insufficient Physical Activity, Sedentary Screen Time and Emotional Well-Being During the Early Days of the 2019 Novel Coronavirus (COVID-19) Outbreak in China: A National Cross-Sectional Study	Fei Qin Yiqing Song	China	2020	Cross-sectional, observational study	Residents of China	To evaluate the characteristics of lifestyle in China during the initial stage of COVID-19 lockdown	Sampling technique: snowball sampling strategy. Sample size: 12107 Population age group: 18-80 years living in China. Study tool : The questionnaire was distributed to Chinese adults living in 31 provinces of China via internet using a snowball sampling strategy. Information on 7-day physical activity recall, sedentary screen time, and emotional state were collected between January 24 and February 2, 2020	During the initial phase of COVID-19 outbreak, nearly 60% of Chinese adults had inadequate physical activity (95% CI 56.6%-58.3%), which was more than twice the global prevalence (27.5%, 25.0-32.2%). Their mean screen time was more than 4 hours per day during home stay (261.3 ± 189.8 minutes per day). Of all participants, the positive affect score was 24.78 and the negative affect score was 19.34.

7	The impact of physical activity on psychological health during Covid-19 pandemic in Italy	GraziaM augeri, PaolaCastro giovanni, Giuseppe Battagli, RobertoP ippi, VeliaD'A gata, AntonioP alma, Michelin oDi Rosa, Giuseppe Musume ci.	Italy	2020	Cross-sectional, observational study	Residents of Italy	(1) changes in the physical activity levels during self-quarantine in Italy; (2) the correlation between physical activity and well-being of individuals.	Study tool : a quick, large cross-sectional online survey realized through Google Forms web survey platform. 2) Sample size : 2524	1) Total physical activity significantly decreased between before and during COVID-19 pandemic in all age groups and especially in men. 2) A significant positive correlation was found between the variation of physical activity and mental well-being, suggesting that the reduction of total physical activity had a profoundly negative impact on psychological health and well-being of population.
8	Physical Activity Levels and Related Energy Expenditure during COVID-19 Quarantine among the Sicilian Active Population	Valerio Giustino, Anna Maria Parroco, Antonio Gennaro, Giuseppe Musume ci, Antonio Palma	Italy	2020	Cross-sectional, observational study	Residents of Italy	The aim of this study was to estimate the levels of PA, expressed as energy expenditure (MET–minute/week), among the physically active Sicilian population before and during the last seven days of the COVID-19 quarantine	Sample : 802 Sicilian physically active participants were included in the study and grouped based on gender, age and BMI. An adapted version of the International Physical Activity Questionnaire—short form was administered to the participants through an online survey.	1) They observed a significant decrease of the total weekly energy expenditure during the COVID-19 quarantine. 2) In particular, the highest and the lowest levels of PA were reported by the young and the elderly, respectively, both before and during quarantine. Finally, the overweight group showed the lowest level of PA during quarantine.

9	Exploring Lifestyle Habits, Physical Activity, Anxiety and Basic Psychological Needs in a Sample of Portuguese Adults during COVID-19	Raul Antunes, Roberta Frontini, Nuno Amaro, Rogério Salvador, Rui Matos, Pedro Morouço, and Ricardo Rebelo-Gonçalves	Portugal	2020	Cross-sectional, observational study	Portuguese adults	1) to characterize the lifestyle habits, anxiety levels and basic psychological needs (BPN), in Portuguese adults during the Coronavirus Disease 2019 (COVID-19) pandemic, including a comparison between genders and age groups.	In total, 1404 adults (36.4 ± 11.7 years; 69.6% female) answered sociodemographic data and three instruments: the International Physical Activity Questionnaire, the Basic Need General Satisfaction Scale and the State-Trait Anxiety Inventory.	1) Males revealed higher values for the total energy expenditure and for the level of satisfaction of competence. 2) Females showed higher scores for the anxiety state and anxiety trait. Regarding age, higher values for the anxiety trait were found in the 18–34 years-old group compared to all the other age groups, also presenting significantly higher values of total energy expenditure when compared to the 35–44 years-old group.
10	The Impact of COVID-19 on Physical Activity Behavior and Well-Being of Canadians	Iris A. Lesser and Carl P. Nienhuis	Canada	2020	Cross-sectional, observational study	Canadians	The objective of this study was to assess how these preemptive measures impacted physical activity behaviour and well-being of Canadians	Study tool : An online survey was utilized to measure participant physical activity behavior, nature exposure, well-being and anxiety levels. Sampling technique : snowball sampling. Sample size : 1098	1) While 40.5% of inactive individuals became less active, only 22.4% of active individuals became less active. Comparatively, 33% of inactive individuals became more active while 40.3% of active individuals became more active. 2) Inactive participants who spent more time engaged in outdoor physical activity had lower anxiety than those who spent less time in outdoor physical activity.

11	Mitigate the effects of home confinement on children during the COVID-19 outbreak	Guanghai Wang Yunting Zhang Jin Zhao Jun Zhang Fan Jiang	.China	2020	NA	Chinese children	To ensure the academic running of the children of china by the chinese government and to evaluate the effects of home quarantine with no school on these children.	Secondary study on China government's adaptation on home schooling plan. Evaluation of the steps taken by Chinese government to advance children's activity with relation to education and physical point.	The government should provide guidelines and principles in effective online learning and ensure that the contents of the courses meet the educational requirements. promotional videos can be useful to motivate children to have a healthy lifestyle at home by increasing physical activities, having a balanced diet, regular sleep pattern, and good personal hygiene. ⁸ To make these educational materials truly effective, they must be age-appropriate and attractive. They require professional expertise and real resources to create.
12	Effects of COVID-19 Lockdown on Lifestyle Behaviors in Children with Obesity Living in Verona, Italy: A Longitudinal Study	Angelo Pietrobelli Luca Pecoraro Alessandro Ferruzzi Moonseo Heo Myles Faith Thomas Zoller Franco Antoniazzi Giorgio Piacentini S. Nicole Fearnbach Steven B. Heymsfield	Italy	2020	Longitudinal observational study	Obese children in Italy	The aim of this study was to test the hypothesis that youths with obesity, when removed from structured school activities and confined to their homes during the coronavirus disease 2019 pandemic.	The sample included 41 children and adolescents with obesity participating in a longitudinal observational study located in Verona, Italy. Lifestyle information including diet, activity, and sleep behaviors was collected at baseline and 3 weeks into the national lockdown during which home confinement was mandatory. Changes in outcomes over the two study time points were evaluated for significance using paired t tests.	There were no changes in reported vegetable intake; fruit intake increased ($P = 0.055$) during the lockdown. By contrast, potato chip, red meat, and sugary drink intakes increased significantly during the lockdown (P value range, 0.005 to < 0.001). Time spent in sports activities decreased by 2.30 (SD 4.60) h/wk ($P = 0.003$), and sleep time increased by 0.65 (SD 1.29) h/d ($P = 0.003$). Screen time increased by 4.85 (SD 2.40) h/d ($P < 0.001$).

13	A qualitative report on exploratory data on the possible emotional/behavioral correlates of Covid-19 lockdown in 4-10 years children in Italy.	Luca PisanoDoménico GalimbertiLuca Cerniglia	Italy	2020	Qualitative study	Children of age 4-10 years.	1) To investigate the regressive behavior of children with particular reference to the loss of some developmental skills previously achieved. 2) To explore the child's opposing behavior against the sudden change in lifestyle. 3) To investigate the adaptation behavior of the children with reference to calmness, tranquility, balance, and adaptation to restrictions.	An ad-hoc questionnaire was constructed, divided into three areas, four questions per area, encompassing a total of twelve questions. The questionnaire was administered to parents living in Sardinia (Italy) who have children aged between 4 and 10 years. Sample size : 5989 parents	1) 26.48% of children, who before the Covid-19 emergency had acquired the competence to sleep alone in their own bedroom, asked to sleep in their parent's room. 2) 2.84% started suffering from enuresis. 4) 18.17% began to express fears they didn't have before. 5) 53.53% of children showed increased irritability, intolerance to rules, whims and excessive demands. 6) 21.17% showed continuous mood swings. 7) 34.26% were nervous about the pandemic nervous about the pandemic when watching TV talk-shows about the coronavirus or because of restrictions.
14	What are we doing to the children of South Africa under the guise of COVID-19 lockdown?	Lore van Bruwaene, Fatima Mustafa, Jeane Cloete	South Africa	2020	NA	Children of South Africa	To assess children's access to healthcare and education, and maternal support for hospitalized children.	NA	Schools have been closed, and for many vulnerable pupils this has meant an experience of isolation, anxiety and hunger. These restrictions may be considered a form of abuse or neglect. Children with malnutrition are once more being admitted to paediatric wards in state hospitals.

15	Effect of the Pandemic and Lockdown on Mental Health of Children	Kalpna Thakur & Naveen Kumar & NovRattan Sharma	India	2020	NA	Children of India	To address the psycho-social problems, activities of children at home and problems faced by managing parents unavailability either due to covid infection or working for it in hospitals.	NA	It has been found that children staying at home due to lockdown spend more time in front of TV and internet which can lead to psycho-social problems (like lower self-esteem), internet addiction, cyberbullying which can affect their mental health. Moreover, spending more time inside the house makes children vulnerable to effects of indoor pollution which can affect their brain development leading to limited development of cognitive abilities [2]. Children who are separated from their parents/ caregivers due to their infections or their parents being affected or their parents serving in hospitals are more vulnerable to depression, stress, anxiety, avoidance behavior, and PTSD has been reported.
16	The Mental Health of School-Going Children During Existing Lockdown Situation Due to COVID-19 Pandemic in Bangladesh	Muhammad Anwar Hossain, Sanjida Rahman, Md Rezaul Karim.	Bangladesh	2020	Review study	Children of Bangladesh	The real scenario of the mental health of school-going children of Bangladesh due to the pandemic of COVID-19 with some statements of child specialists, psychiatrists, psychologists,	NA	Factors disturbing the mental health of children and the factors that can help get rid of the depression.

							cal point of view and expertise.		
17	The Italian paediatric society recommendations on children and adolescents extra-domestic activities during the SARS COV-2 emergency phase 2	Alberto Villani, Elena Bozzola, Paolo Siani & Giovanni Corsello	Italy	2020	NA	Italian population	To discuss the opportunity for children to practice safely recreational or physical activity outdoor.	NA	Suggested specific recreational and physical activities according to the age of the children and respecting social distancing.
18	How to deal with COVID-19 epidemic-related lockdown physical inactivity and sedentary increase in youth? Adaptation of Anses' benchmarks	Irène Margaritis, Sabine Houdart, Youssef El Ouadrhiri, Xavier Bigard, Anne Vuillemin, Pascale Duché.	France	2020	NA	French	To suggest whether, why, and how to deal with short- or medium-term lockdown-related PI and SB increase in young children and adolescents.	NA	WHY - A sedentary lifestyle is a risk factor for chronic diseases and increased mortality. The context of lockdown promotes these SB and can lead to an increase in time spent sitting or lying down (apart from sleeping), the effects of which can be deleterious on health, including mental health. HOW - Limit the total daily duration of sedentary activities while awake; limit the duration of each sedentary activity, so as not to exceed 1 h continuously for children under 6 and 2 h for children aged 6–17 years.

19	Psychological impact of lockdown (confinement) on young children and how to mitigate its effects	Adrián García Ron, and Isabel Cuéllar-Flores	Spain	2020	Review study	Spanish	to review the available evidence on the psychological impact of quarantine on children, looking for the main stressors and protective factors during it.	A rapid review of the psychological impact of quarantine on children and adolescents has been carried out, following WHO recommendations. 3 electronic databases (PubMed, EMBASE and Google Academics) were used in addition to expert recommendations. Of 57 documents found, only 3 met the requirements and were included in this review.	Recommendations of experts with greater consensus is proposed to mitigate the negative impact of quarantine on minors.
20	Coronavirus lockdown effect on type 1 diabetes management on children wearing insulin pump equipped with continuous glucose monitoring system	Athanasios Christoforidis, Evgenia Kavoura, Aggeliki Nemtsa, Konstantina Pappa, Meropi Dimitriadou.	Greece	2020	NA	Greece children with DM type 1	to monitor the effect of the coronavirus lockdown in diabetes management in children with Type 1 Diabetes Mellitus (T1DM) wearing insulin pump equipped with continuous glucose monitoring system.	n 34 children with T1DM on Medtronic 640G insulin pump equipped with the Enlite Sensor uploaded CareLink data were categorized in 2 three-week periods before and after the 10th of March.	A significantly higher Coefficient of Variation (CV) indicating an increased glucose variability in the pre-lockdown period was observed. Blood glucose readings were significantly fewer during the lockdown period. the meal schedule has changed dramatically as the percentage of breakfast consumed before 10.00 a.m. has fallen from 80.67 % to 41.46 % (p<0.001) during the lockdown. Correspondingly, the percentage of dinner consumption before 10.00 p.m. significantly fell during the lockdown period (60.22 % versus 53.78 %, p=0.019).

21	Potential effects of “social” distancing measures and school lockdown on child and adolescent mental health	Vera Clemens, Peter Deschamps, Jörg M. Fegert, Dimitris Anagnostopoulos, Sue Bailey, Maeve Doyle, Stephan Eliez.	Europe	2020	Qualitative study	European children	To discuss the potential effects of social distancing and school lockdown on and children and their inaccessible support services.	NA	Lockdown has resulted into inaccessibility of mental health and other support services to children and staying at home has shown major effect on their physical and mental health.
22	Exercising in Times of Lockdown: An Analysis of the Impact of COVID-19 on Levels and Patterns of Exercise among Adults in Belgium.	Constandt, Bram; Thibaut, Erik; De Bosscher, Veerle; Scheerder, Jeroen; Ricour, Margot; Willem, Annick	Belgium	2020	Cross-sectional study	Older adults of Belgium	To examine adults' exercise levels and patterns during the COVID-19 lockdown in Belgium.	By an online survey Ordinal logistic regression analyses of 13,515 valid and population-weighted responses.	The people who were already high active before COVID-19, those above 55 years old, those with low education, those used to exercise with friends or in a sport club, and those who were not using online tools to exercise, self-reported to exercise less during the lockdown.
23	The Importance of Physical Activity to Care for Frail Older Adults During the COVID-19 Pandemic	Mylene Aubertin-Leheudre PhD a,b, *, Yves Rolland MD, PhD	Canada	2020	NA	Older adults	To identify the importance of physical activity for older adults and recommend activities.	NA	Suggested physical activities and discussed on its importance in Frail older adults during the pandemic.

24	Coping with being cooped up: Social distancing during COVID-19 among 60+ in the United States	Emerson, Kerstin Gerst Rev Panam Salud Publica	US	2020	Cross-sectional study	60+ adults of US	The impact of sheltering in place and social distancing among adults aged 60 and older during the 2020 outbreak of COVID-19 in the United States	Using convenience sampling respondents were asked to complete a web-administered survey to explore impact of social distancing on loneliness, stress, and behavioral changes. The analytic sample consisted of 833 responses of persons aged 60 and older	A large portion reported being stressed (36%), and/or being lonely (42.5%). Respondents reported engaging in more solitary activity (and fewer in-person activities), using email and text messages more than usual, and spending more time on computers/tablet than usual. Approximately 2/3 reported using more social media than usual. Additionally, changes in physical activity, drinking, recreational drug use and sleeping pattern changes differed by age.
25	Immunological Implications of Physical Inactivity among Older Adults during the COVID-19 Pandemic.	Damiot, Anthony; Pinto, Ana Jessica; Turner, James E; Gualano, Bruno	NA	2020	Review study	NA	To discuss the negative impact of physical inactivity on immune function and showcase evidence that regular physical activity may be an effective strategy to counter some of the deleterious effects of social isolation.	NA	promoting an active lifestyle is a key intervention to counteract the effects of social isolation, especially in older adults and other at-risk individuals, such as those living with chronic diseases associated with ageing and lifestyle.
26	Can physical activity improve the mental health of older adults?	Nicola T Lautenschlager, Osvaldo P Almeida, Leon Flicker & Aleksandar Janca	Australia	2004	NA	Australian older adults	To find relation between physical activity and mental health.	NA	There was relation found between physical activity and mental health of older adults.

27	Physical inactivity among older adults across Europe based on the SHARE database.	Gomes M, Figueiredo D, Teixeira L, Poveda V, Paúl C, Santos-Silva A, Costa E	Europe	2020	Cross-sectional study	Older adults of Europe	The purpose of this study was to evaluate the prevalence of, and factors related to, physical inactivity among older adults across Europe.	A cross-sectional analysis, data from participants aged 55 or older in Wave 4 of the Survey of Health, Ageing, and Retirement in Europe (SHARE) database, a multidisciplinary and cross-national panel database covering health, socioeconomic status, and social and family networks. 58,489 individuals included in this study were classified as physically active or physically inactive.	The overall prevalence of inactivity among individuals age 55 or older in the 16 included countries was 12.5%. The prevalence of physical inactivity varied between countries, ranging from 4.9% (Sweden) to 29% (Portugal).
28	Social Distancing and Outdoor Physical Activity During the COVID-19 Outbreak in South Korea: Implications for Physical Distancing Strategies	Sunhee Park, Beomso Kim, Jaeil Lee.	South Korea	2020	Cross sectional analysis	Older adults	to examine effects of social distancing on the Public Bicycle Sharing System (PBSS) during the COVID-19 outbreak.	Database of PBSS in Seoul. for a cross-sectional analysis of bicycle use at 2 points in time: January to March 2019 and January to March 2020. The latter was during the COVID-19 peak, when strict social distancing was imposed in Seoul from March 22. They performed descriptive statistics (independent t tests) and difference-in-differences (DID) analyses to examine the effect of social distancing on PBSS use during the COVID-19 outbreak.	Average daily PBSS usage in 2020 doubled over that of 2019 (30 697 vs 77 996, $P < .001$) There was a significant difference in time (ie, not only time of day but also day of the week) during which individuals utilized PBSS. DID analysis showed statistically significant positive effects of high levels of social distancing on PBSS usage and number of commuters, weekend users, and new subscribers after controlling for day

29	Recommendations for physical activity in older adults	Phillip B Sparling and colleagues	NA	2020	NA	Older adults	To recommend physical activities for older adults.	NA	Recommendations
30	Coronavirus Lockdown: Forced Inactivity for the Oldest Old?	Gil Caspi, Jacob Chen, Sigal Liverant-Taub	France	2020	NA	France old adults	To analyse the implication of lockdown on oldest old	NA	Rationalizes between mortality of older people and forceful stay at home order leading to inactivity.

DISCUSSION

- **SCHOOL GOING C&A**

So when looked into the effect of lockdown on children and their physical and mental health, schools being closed showed significant repercussions on the well-being of children. Physical activity was decreased the most in the generation with highest energy levels i.e. the Children, indirectly affecting their mental well-being too.

The UN Educational, Scientific and Cultural Organization assesses that 138 nations have shut schools across the nation, and a few different nations have actualized territorial or nearby terminations. These school terminations are influencing the training of 80% of kids around the world. Although logical discussion is progressing with respect to the viability of school terminations on infection transmission.'

Home care of C&A is known to decrease the level of physical activity and increase in sedentary time, specially screen-time. Evidence suggests that when the schools are off (for example, weekends and summer holidays), children have less physical activity, increased screen time, irregular sleep patterns, and lesser healthy diets, resulting in weight gain and reduction of cardiorespiratory fitness. As we know, most C&A are vulnerable to internet, smart phones, TV, online games and social platforms. And now that the schools are closed, they tend to spend more time surfing social media and/or watching TV (increased screen time) leading to a sedentary lifestyle. Several observational and experimental studies show that increase in Sedentary behavior is associated with higher obesity and cardio-metabolic risks in C&A. And the event of lockdown indirectly promotes sedentary behavior which can lead to increase in time spent sitting or lying down which ultimately affects the mental and physical health of the children.

In addition, many families have limited resources and they have to share restricted space at home which may limit the activities that result into coping up with n number of situations. Parents who WFH rigorously for long hours might not be able to give children the time that they need to cope with such adjusting situations. Toddlers and children below 5 years of age require constant attention which end up being a difficult task for WFH parents with no help. Loss of job, a death in family, domestic violence, child abuse, family disputes etc. are major occurring events during lockdown that the child of the family has to go through. Dysfunctional families already give children of the family a hard time, anything else is an add-on.

Emotional behavior in view of lockdown on children of 4-10 years of age shows that many children, who before the Covid-19 emergency had acquired the competence to sleep alone in their own bedroom, asked to sleep in their parent's room. Some also expressed fears they didn't have before and showed irritability, anxiety and nervousness regarding restrictions and school closures. Indian studies state that staying inside the house for more time may make children vulnerable to the effects of indoor pollution as a result affecting brain development which can limit the development of cognitive abilities. The study also highlights the fact that children whose parents are serving in hospitals or are involved in the front run of fighting covid-19 are more vulnerable to anxiety, stress, depression and PTSD has been reported.

For many C&A, school is not just a place for learning but is also a source of eating healthy nutritious food. Research shows that school lunch is associated with improvements in academic performance, whereas food insecurity (including irregular or unhealthy diets) is associated with low educational attainment and substantial risks to the physical health and mental wellbeing of children.

Children in low income households have difficulty in home schooling as there is no availability of resources, even online learning is a huge luxury due to lack of internet and technology available to them. A substantial number of children live in homes in which they have no suitable place to do homework or have no access to the internet. Furthermore, children live in homes that have no access to outdoor leisure facilities, and do not have access to books at the appropriate reading level.

To mitigate the effects of lockdown on children's psychological and physical health, Italian pediatric society recommended specific recreational and physical activities according to the age of the children and respecting social distancing. The government of Spain considering recommendations by experts suggested general measures and specific measure for C&A with disabilities, neurological developmental disorders or mental health problems to reduce the negative psychological impact.

- **ADULTS (18-64)**

In context of the second objective, there was a mixed result seen among individuals. In the initial phase of lockdown people experienced difficulties in practicing a regular routine of exercise/workout. Due to restrictions and lockdown, there was no access to their gym/workout places. Almost 70% studies confirm the decrease in physical activity among individuals and adaptation of sedentary lifestyle during the lockdown period. However, in some countries, like Canada, where majority of active individuals (60%) had difficulty following their exercise/workout routine, as many (22%) inactive individuals became active during the initial phase of lockdown. Many inactive people took up indoor exercises, started walking, cycling etc. In later stages, it's seen that many active individuals increased their physical activities as their way to de-stress and refresh the brain in their days of anxiety. Inactive individuals got plenty of free time to actually workout at home. Some studies also show no change in the physical activity of people but the percentage of people showing no change is very less, these were mostly strict fitness followers.

On the other side, a major change in sleep cycle and quality of sleep has been noticed due to lack of physical activity. In China, more than 60% individuals were living in a sedentary lifestyle with mean screen-time of individuals increased up to 4 hours/day i.e. more use of internet and TV. As having ample of time during lockdown people were drawn to spend more time watching TV and sleeping.

Studies showed association between physical inactivity and obesity, it also observed energy levels among children are usually highest and lowest in elderly and obese, although significant decrease in energy levels was seen especially among men and younger generation. There was decrease in total weekly energy expenditure of 60% adults. Researchers associated less intensive physical activity during lockdown with obesity, hypertension, depression, lung disease and disability.

- **ELDERLY (64&ABOVE)**

There weren't many studies found on the effect of lockdown on physical activities in older adults but the few studies that came across definitely tells us about decrease in physical activities and that the movement is restricted among this age group especially people suffering from chronic diseases. Ageing, physical limitations, lack of zeal towards life, poor social and family support are reasons associated in reduction of physical activity.

Healthy older adults mostly complained about not being able to go for group physical activities programmes and socializing. Some even took up on walking in their later stages of ease in lockdown. Home quarantine didn't give many options to them considering their age. Lack of activity inculcated loneliness, boredom, depression, loss of appetite in many older individuals.

RECOMMENDATIONS

- 4) **FOR SCHOOL GOING C&A:** Studies suggest walking, running, bicycling, jumping or any vigorous activity for at least 60 mins/day involving activities that strengthen the muscle and bones. Playing in safe indoor places was recommended. Practicing healthy diet and restriction in screen time by parents to reduce sedentary culture.
- 5) **FOR PARENTS/GUARDIANS:** They are the closest approachable beings to their own children. Good parenting skills can immensely help a child during confinement. In order to suffice sedentary behaviour among children various studies have suggested some ways for parents by which they can help the child to improve their physical and psychological status:
 - a) **Close and open communication** with the children is the basic way to identify any physical and psychological issues and to provide comfort to children in prolonged isolation. Parents play an important role models in healthy behavior of a child.
 - b) **Respecting child's identity and needs** is also very important to build the trust of own child which can help in creating a comfort zone between them.
 - c) **Direct Conversations** about pandemic like news, issues faced by its effects like sedentary behavior and emotional imbalance.

- d) **Indulging in family activities** may help the children bond with the parents better and home confinement has given a good amount of time for those.
 - e) **Monitoring Child's activities** be it physical activities or using mobile phones, tv, sleep schedule, eating habits etc. for e.g. Having fixed a bedtime (approved by kids), no screen-time before bedtime, healthy breakfast, encouraging sports and indoor games that enhances their body and brain which can also help children develop self-discipline skills.
- 6) **FOR ADULTS:** Studies suggested adapting habits like walking, cycling or any activity that follows social distancing guidelines of WHO. Taking up on Zumba, aerobics, home workout routine, yoga etc with the help of online videos. At least 150 mins/day moderate intensity physical activity during a week is recommended.
- 7) **FOR ELDERLY/OLDER ADULTS:** It is stated that the amount of activity in adults and elderly is the same only that older adults are recommended to divide those minutes into 10 minutes' episodes for the week. It can also involve 30 minutes of brisk walking or similar activity for 5 days a week. Also, activities to include strengthening exercises and stretching twice a week.

For older adults of even elder age are suggested to practice light exercises for balancing and strengthening the body.

LIMITATION OF THE STUDY

- 1) Limited amount of literature was reviewed.
- 2) Not many studies were found on Older adults so the results for them can be biased.
- 3) As it is an ongoing pandemic and studies are still developing on the topic and researchers are coming up with new data every day.
- 4) This study is more of a general study irrespective of population and regional demographic constraints.

CONCLUSION

After reviewing all the studies in length, one thing that was confirmed was that all the age groups, more or less have been affected both physically and mentally. The level of physical movement/activity has surely decreased among all age groups, especially in Children. Physical and mental health of Children and Adolescents is severely affected and the government must come up with innovative ideas to keep the children motivated in such times. And in times, where even the Adults are having a difficult time to cope up and maintain their physical fitness, the adverse effect on older adults (especially with chronic diseases) cannot be ignored.

As the whole world is living in unprecedented times, there is a lot we don't know about the virus and its effects. So, in order to fight it, one of the measures researchers emphasized is keeping up the physical activities for betterment of our own immune system and mental health. Although, there is no direct study that say that physical activity can safeguard one from Covid-19 virus. However, evidence suggests that physical activity do keep our immune system and defense mechanism of the body in a much better condition.

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PART 2
ONLINE COURSES

1) MANAGEMENT DEVELOPMENT PROGRAM ON “DATA ANALYTICS USING R” DURING JULY 1-5, 2020 BY IIHMR UNIVERSITY IN COLLABORATION WITH IOA LONDON.

COURSE INSTRUCTOR:

- Mr. Prashant Sharma, IIHMR university and
- Dr. Vinod Murti

COURSE DISCRIPTION

R is a language and environment for statistical computing & graphics, it is the most preferred open-source language for analytics and data science. R can be used for simple calculations, matrix calculations, differential equations, optimization, statistical analysis, plotting graphs, etc. I have selected this one-week online course on ‘Data Analytics using R’ organized by IIHMR university in association with Institute of Analytics, London which is a by Management Development Programme for its analytical benefits considering large datasets and it is:

- an all around created, straightforward yet viable programming language which incorporates conditionals, circles, user→ characterized recursive capacities and information and yield offices
- a viable information dealing with and storeroom
- a set-up of administrators for calculations of on arrays, matrices in particular
- a huge, intelligent, incorporated assortment of instruments for data analysis
- graphical offices for data analysis and show either on→screen or on printed version.
- R has its own LaTeX →like documentation position, which is utilized to flexibly thorough documentation, both on→line in different organizations and in printed version.

OBJECTIVES OF THE COURSE:

- To understand how to install R and RStudio
- To learn how to read files, manipulate data using different functions of R
- Access data from vectors, list, matrices using different operations
- To understand major data structures

COURSE CONTENTS:

- 1) Introduction to R Environment, R Script, Console
- 2) To download and install R studio
- 3) Basics of R Programming, Vector, Matrices, Data Frame, Import and export of data files, Mathematical and Logical arguments, Data Manipulation

- 4) Descriptive analysis
- 5) Data Visualization
- 6) Histogram, Box Plot, Bar Chart, Correlation Matrix, Scatter Plots and Heat Maps
- 7) Hypothesis testing using R - t-test, ANOVA, Chi-square
- 8) Introduction to Predictive Analytics
- 9) Simple Linear Regression, Multiple Regression, Assumptions of OLS, Violation of Assumptions and Diagnostic Procedure
- 10) Testing of Simple Linear Regression, Multiple Regression, Assumptions of OLS, Violation of Assumptions using R and Application of Diagnostic Procedure

METHODOLOGY

This course comprises of 2 hour long online lectures daily for a week scheduled from 4 pm to 6 pm with two faculties guiding throughout.

The First step is to install R and RStudio by following the steps given in installation sheet.

After installation, a schedule was provided on what topics would be covered every day in the 2hour session followed by assignment or projects to be completed by the next day.

KEY LEARNING

The key learning from this course majorly was how to import data sets in R studio and its use to analyze those datasets. Learned to plot histograms, box plots and bar graphs, how to form matrix etc. One major part of this course covered usage of R in hypothesis testing which I feel is very important considering the research field.

2) COVID 19 CONTACT TRACING BY JOHNS HOPKINS UNIVERSITY

COURSE INSTRUCTOR:

- Emily Gurley, PhD, MPH

Associate Scientist, Epidemiology. Johns Hopkins Bloomberg School of Public Health.

COURSE DESCRIPTION

Covid-19 is an infectious disease caused by a virus of new origin called as Sars-CoV-19. As we all know this is a disease easily spread through close contact with the infectious person, so contact tracing is a very important tool in tracking COVID19 infected people. It not only digs into the science of COVID19 and its origin covering all the basics but also also defines contact tracing, quarantine and isolation.

This course also guides about skills for effective communication involved in contact tracing as they talk about ethical dimensions and issues faced by tracers.

OBJECTIVES

- To learn about the basics of COVID-19- it's origin, clinical signs and symptoms, risk factors, diagnosis, transmission etc.
- To understand the basics of contact tracing for COVID-19
- To learn about Ethics of contact tracing including issues encountered by contact tracers
- To provide effective communication skills for contact tracing.

COURSE CONTENT

- 1) Basics of Covid-19: it's origin, clinical signs and symptoms, risk factors, diagnosis, transmission and infectious period.
- 2) Basics of Contact tracing, isolation and quarantine.
- 3) Calculating Isolation and Quarantine duration and identifying high risk situations.
- 4) Steps to investigate cases and trace their contacts.
- 5) Ethics of Contact tracing and Technological tools.
- 6) Skills for effective communication.

METHODOLOGY

This one-week online course was taken up from courser of 8 hours' duration. It comprises of online recorded lectures divided into sections involving a quiz at the end of every section and every video. A final assessment test of learnings from this course was also taken consisting of 40 questions.

KEY LEARNING

In the emerging era of this pandemic, very less is known about this virus. Such a course from a reputed health university has made me learn a lot about COVID-19 and it's effects on human population.

The key learning about this course was to understand about the infectious period. In order to trace the contacted person, one must need to very well understand about the infectious period of the case in which he/she could have infected the contact person.

Contact tracing is a very important tool to learn in order to limit the spread of COVID-19.