

Trends in cognition and behavior in patients with MCI and dementia during the pandemic

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Penn Medicine



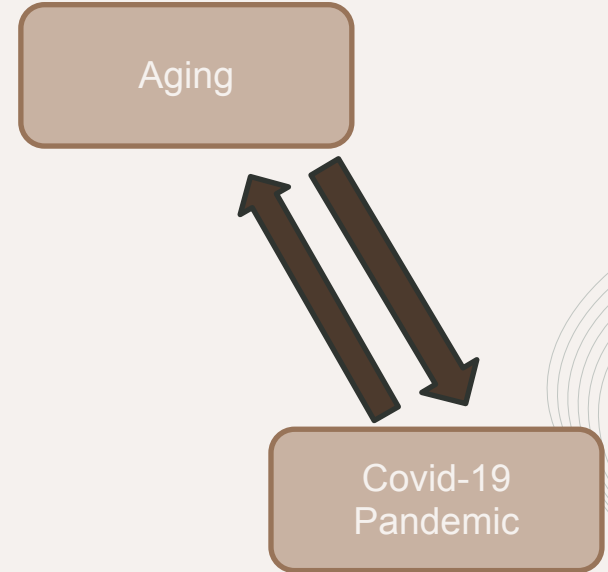
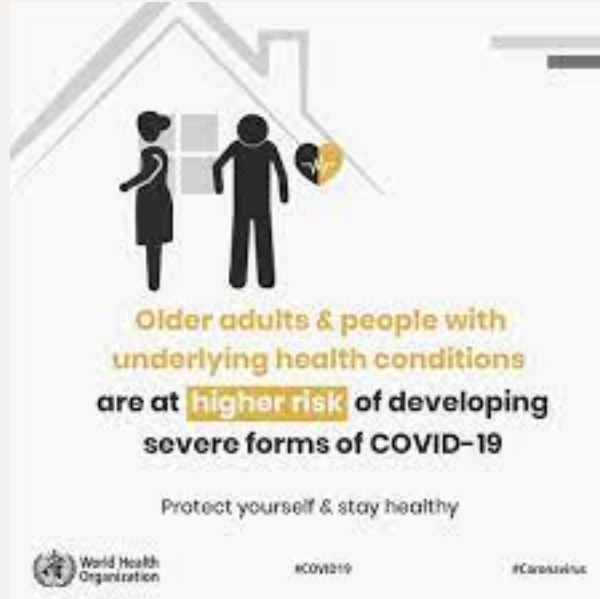
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Conceptual Framework: Aging and Covid

The Covid-19 Pandemic has been well-documented for its adverse effects on aging communities.

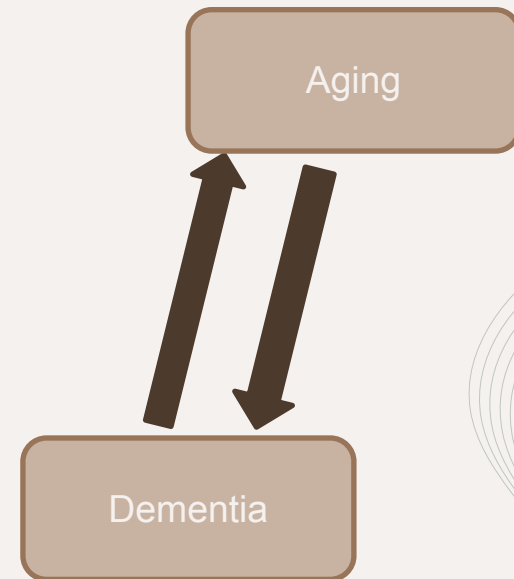
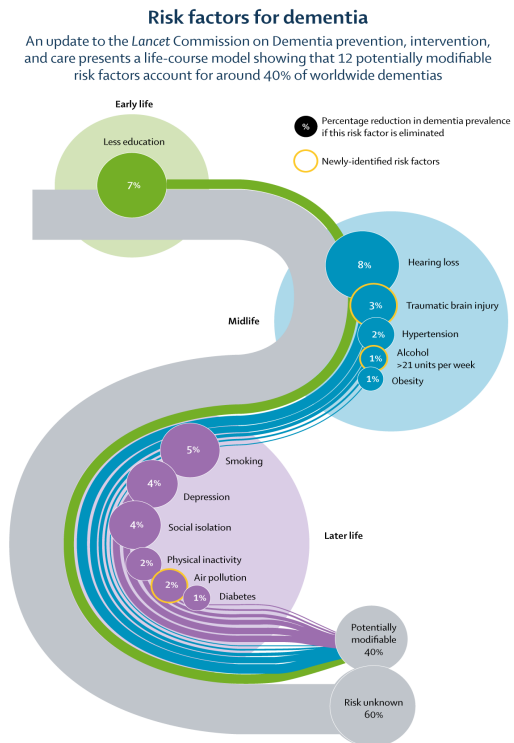
It impacted physical health, posed additional risks to safety within social isolation, and decreased access to resources.



Conceptual Framework: Aging and Dementia

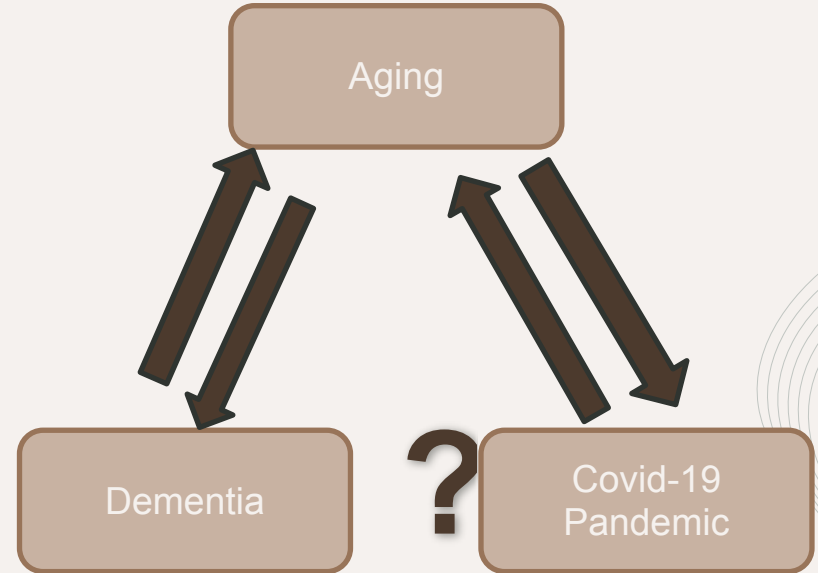
Differing levels of cognitive decline characterize dementia and mild cognitive Impairment.

- Risk factors for dementia include obesity, low social contact, low physical activity, etc.
- The highest risk factor for a dementia diagnosis is Aging. For adults aged 65 to 69, 2 out of every 100 people will have dementia.



Significance: Covid-19 and Dementia

Gaps in the literature remain on how the Covid-19 pandemic disrupted the lives of a specific population of aging individuals: those with dementia.



Aims

01

Literature Review

Conduct a review on the existing literature surrounding cognition, dementia patients, and the Covid-19 pandemic timeline.

02

Analyses+ Individual Project

From the literature review, multiple gaps are identified, which warrant future study. From there, I would use the existing data sets and settle on an idea. A possible future direction aside from the main goal of my analysis is creating a case report on dementia rates during the pandemic.

Aim 1: The Literature Review

Methodology:

1. PubMed, Google Scholar, Franklin Library searches
2. Compiling the articles and going through them
3. Writing a summary to serve as a background for future papers aside from the literature review

Challenges:

- How to fine-tune your searches and know what you're looking for

	SOURCE (AUTHOR, DATE)	TOPIC/MAIN IDEA	POPULATION OF STUDY	RESULTS/CONCLUSIONS	LIMITATIONS	CONNECTION TO OTHER STUDIES	RELATION TO RESEARCH PROJECT
JURCE 1	The impact of COVID-19 pandemic on people with mild cognitive impairment/dementia and on their caregivers. Int J Geriatr Psychiatry. 2021	The study took place in Greece, and aimed to look at how the Covid-19 Pandemic affected people with an MCI/Dementia. The main findings was that due to elements of the conditions like the need for structure, the population being older and having less connection through technology, there was a lot of psychological stress. Mood and communication from this population severely decreased.	The population of this study was 240 caregivers who took a survey regarding the activity+ burden of a person with MCI/Dementia during the covid-19 pandemic. The participants were recruited from people who were at Day-centers or other practices.	The data included a total of 74 people who had a MCI/Dementia. After conducting an analysis on the survey, people with the MCI/Dementia were mostly affected in mood, communication, and ability to comply to covid measures. Part of this was attributed to the importance of a plan for a person with dementia.	The main limitations were reported: cross-sectional design, self-reported measures, small sample size. Also, the short period of time where the results were given, with no comparison to burden post pandemic. Furthermore, missing diagnosis statistics. Finally, it is hard to determine whether the burden is due to dementia or the pandemic.		
JURCE 2	Cognition, Behavior, and Caregiver Stress in Dementia during the COVID-19 Pandemic: An Indian Perspective	The study took place in India, and sought to understand how the pandemic had affected a "middle-income" country as compared to how patients with dementia were reacting in other countries. Using two different points in the pandemic a lot and more restrictive period, the investigators were able to measure the progression of symptoms throughout the pandemic. The findings include a worsening of cognitive and neuropsychiatric symptoms.	The population of this study was 66 caregivers, who filled out surveys regarding the functioning of the person with which they cared for. The participants were recruited from urban-clinical spaces within India.	In cognitive status: the proportion of patients who qualified for severe dementia increased 20%. Moreover, there was a larger amount of behavioral symptoms noticed in anxiety and eating disturbances. When compared to baseline and then subsequent assessment, a high proportion of patients manifested them after the fact. For dementia rehabilitation, we saw a significant decrease in three categories: physical activity, medical care, and long-term support. From the baseline to follow up, 47.4% of patients stopped engaging in physical activity. There was also a significant decrease in access to medical support and services.	One of the implications of this study was the urban nature of participation is not reflective of the rural population which may struggle with dementia in a high population. Moreover, the lack of confinement on the burden of caregivers is still up. Furthermore, there was an inability to determine the type of eating disturbances.		
JURCE 3	Cognitive, Functional, and Emotional Changes During the COVID-19 Pandemic in Greek Patients with Neurocognitive Disorders	The Study took place in Greece, and was looking at the responses of patients with a mild cognitive impairment or Dementia during the pandemic. The study found a significant decline in functioning as related to new theme I can introduce, "social isolation"-which consisted of a lack of neurological functioning and lower cognition. This finding was supported by the study using different neuropsychological measures.	The population of this study was 122 patients with dementia at a particular hospital. What is unique about this study was the control-experimental group. The control group consisted of a group of individuals with cognitive impairment over time, and the experimental group was over the pandemic.	The study found that the experimental group had a significant decline overtime in cognitive functioning, as compared to the control group. In the control group, there was no difference between the baseline and follow up, but the experimental group had differences in all tasks. This resulted in a cognitive decline beyond the norm resulting in the pandemic. A lack of a protective factors to counteract the "social isolation" which caused a deterioration of brain function. Furthermore, tech literacy presented a problem, as it contributed further to social isolation.	Limitations include a small sample size as well as a sample of only patients living at home; reducing generalizability. Another limitation of the study is that there were more neuropsychological tests that could have been used. Furthermore, changes were not assessed to be transient or lasting.		
JURCE 4	Neuropsychiatric Symptoms in Patients with Dementia Associated with Increased Psychological Distress in Caregivers During the COVID-19 Pandemic	Effect of COVID-19 on the distress of dementia patients and their caregivers throughout the pandemic's duration (79.3%).	Dementia patients receiving care throughout the duration of the COVID-19 pandemic. Age of patients ranged from 21 to 87 years old (median of 57 years old), and majority was female (58.9%). The range of caregivers was from 55 to 89 years old (median of 76 years old), and majority was female (79.3%).	Collectively, caregiver and patient distress worsened over the course of the pandemic. Effects/symptoms included spathy, depression, and decreased cognitive function. This was largely true for low educated patients w/ dementia, where there was a heavier burden placed on caregivers.	Only a single measure was recorded for patient and caregiver distress i.e., this could over or underestimate the impact COVID-19 on patient and caregiver distress as there was no pre-existing measure before COVID-19.		

This paper relates to my research project because it discusses the psychological implications of the covid-19 pandemic. Especially when the inability to follow measure, this can give a clue as to the cognitive function who are worsening. I would include it in the previous research done on cognitive function, to assert it has been done but it doesn't go in the why we are looking for. I can make a theme from this "disruption of routine".

This paper is important because I am developing a greater why surrounding a cognitive decline: the two main themes was a loss of physical activity and loss of access to appropriate treatment. This can guide me in my lit review and my reasons for the cognitive function. Overall, this paper was super useful. Main themes: Access to care; difficulties in accessing care was the result of the pandemic, which then resulted in adverse neuropsychiatric outcomes for patients with dementia that could be attributed to an interruption of therapies. A large jump in cognitive decline, more than the acute could be the result of covid and lack of functional activity.

This paper gave me another main proposition I can talk about in my paper. The idea of social isolation. I am thinking of combining it, to make a everyday active caregiver. I think this paper does a good job showing the cognitive decline which is the main trend I am noticing.

This paper is really important as it brings up the point of patient and care giver relationships, and shows that under stressor environments, relationships are tested and worsen.

Findings

There were two main findings noted in changes in cognition and behavior in patients who experience MCI or Dementia:

- There were greater drops in cognition during the pandemic as compared to before
- Greater prevalence of neuropsychiatric symptoms

Greater Loss of Cognition



01

Loss of
Medical
Care

02

Loss of
Physical
Activity

03

Loss of
Social
Contact

Main Themes

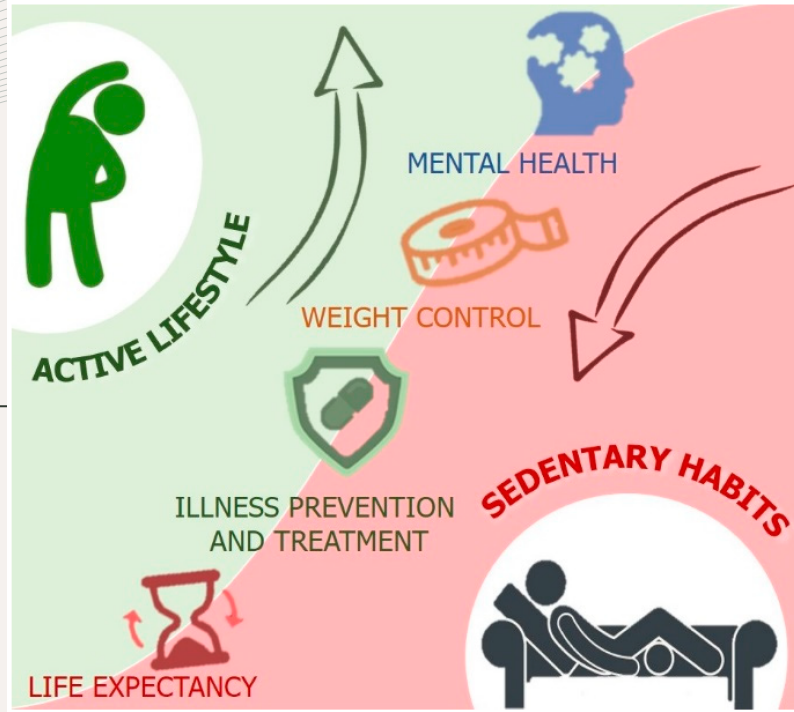
Loss Of Medical Care

Due to the Covid-19 pandemic, many necessary services were required to move online or shut down completely.

- Older adults were more likely to experience changes in necessary appointments.
- Increase in provider-based cancellations, pandemic-based fears, and caregiver availability.
- Health check-ups, therapies, and medications were all put at risk



Loss of Physical Activity



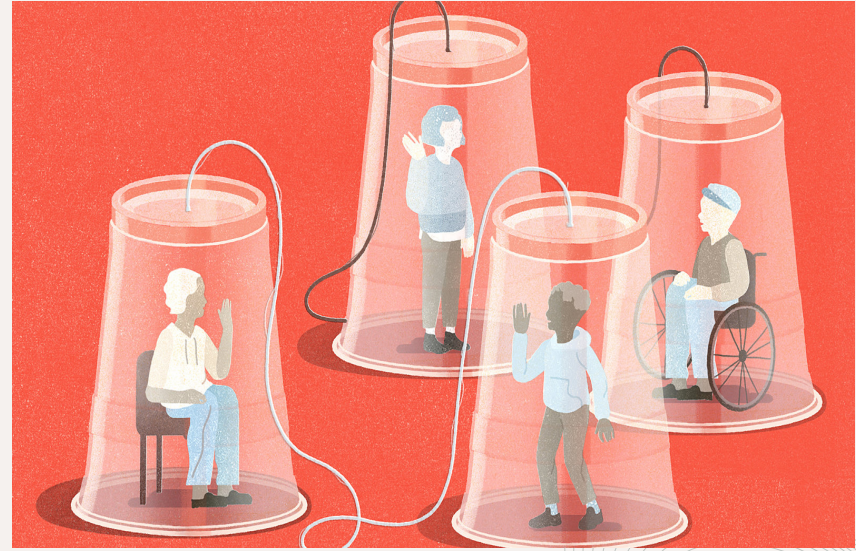
Due to the restrictions of the pandemic and the need for social isolation, reported levels of physical activity went down in older adult populations.

- Routines were often disrupted
- One study found that eleven out of thirty-six patients progressed to severe dementia during the pandemic
- Previous research indicates that physical activity and cognitive health have a direct relationship

Loss of Social Contact

A lack of social contact has been shown to have adverse effects across populations, with extra consideration given to older populations who may rely on caregivers/social relationships to maintain well-being and health.

- Social contact is essential to maintaining mood, communication skills, and symptom management for those with dementia.
- Those living alone are at the most significant risk.



Aim 2: Data Analyses

After the initial literature review, we then started to look at the gaps in what we had found. This is what would make up subsequent data analyses.

Early parts of this aim included:

- Spent time drafting abstracts for possible analyses ideas
- Looked at the existing datasets to see what is feasible
- Created a statistical plan to prepare and run the analyses and pull appropriate data

NHATS Dataset



National Health & Aging Trends Study



National Study of Caregiving

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Welcome Researchers

This website provides researchers access to data, documentation and other resources for the National Health and Aging Trends Study (NHATS) and the National Study of Caregiving (NSOC). If you are an NHATS or NSOC participant, please visit www.mynhats.org.



NHATS



NSOC



Data Access



Publications

Participants

Social Protective Factors and Dementia

Definition:

Social protective factors are social/situational factors that serve as a resilience or protective factor against deficits in old age.

Examples:

Socioeconomic status, community engagement, and physical activity will all be independent variables within this study.

Methodology:

Use a proportional hazards regression: multivariate cox proportional hazards model to estimate hazard ratios that describe the relationship between the protective factors and dementia outcomes.

Hypothesis:

The presence of social protective factors will protect against worsening cognition and dementia outcomes in older adults during the Covid-19 pandemic.

Creating a Statistic Plan

NHATS Round 11

Section **CM** [COMMUNITY] Sequence: 12

CM1PRE **CM1PRE** NOT ON FILE

Now I'm going to read some statements about the community where {you live/SP lives}.

PRESS 1 AND ENTER TO CONTINUE

CM1 **cm11knowwell** R11 CM2 PEOPL KNOW EACH OTHR WELL

DISPLAY INSTRUCTIONS:

Use "Same Question Stem" display.

Display CM1, 2, and 4 on the same screen.

QUESTION TEXT:

People in {this/SP's} community know each other very well. Do you agree a lot, a little, or do you not agree?

CODES

1 AGREE A LOT
2 AGREE A LITTLE
3 DO NOT AGREE
REFUSED
DON'T KNOW

CM2 **cm11willnghlp** R11 CM2 PEOPL WILLG HLP EACH OTHR

DISPLAY INSTRUCTIONS:

Use "Same Question Stem" display.

Display CM1, 2, and 4 on the same screen.

QUESTION TEXT:

People in {this/SP's} community are willing to help each other. [Do you agree a lot, a little, or do you not agree?]

CODES

AGREE A LOT

Characteristic	NHATS variable name	Variable Coding	Possible Dementia, Probably Dementia, No Mci or Demetntia
Age(fixed)	<p>r9d2intvrage (R9 D SP CAT AGE at INTVW)</p> <p>R9dintvrage (R9 D Age of SP at Interview)</p> <p>- Taken from other variables</p> <p>IS Round 5: R5dbirthyr (birth year of SP) R5dbirthmth (birth month of SP)</p> <p>R5dintvrage (age of sp at interview)</p>	<p>Derived variable—IS, interview Set Up</p> <p>Programmed in Month range: 1-12 Day Range: 1-31 Year Range: (current-65)- (current-110)</p> <p>Codes 1=yes Codes 2=no</p>	<p>Possible and Probable Dementia= outcome =1=yes NO Dementia=2= No</p>
Gender(fixed)	<p>Taken from IS Round 5:</p> <p>R5dgender (R5 Gender of SP)</p>	<p>Code 1: male Code 2: female</p>	<p>Possible and Probable Dementia= outcome =1=yes NO Dementia=2= No</p>

Current and Next Steps:

Currently: I am working on finishing the statistical plan which will be used to pull appropriate variables from the NHATS dataset to run the subsequent analysis with.

- Includes going through instruction manuals and sorting through variable names for the best representation of each protective factor
- Undergoing R-studio training to better prepare myself to run the analyses

Future Steps: Continue to work with Dr. Willis and Dr. Hamedani to run the analyses and work on finishing a manuscript. Connect with the team's R statistician to work on analyses.

- Write a case report on dementia rates
- Write the manuscript on social protective factors and dementia

Lessons Learned

1. Working Independently

I was given a lot of freedom with how I got the work done, where I wanted my work to go etc. I had to learn how to be proactive and search for answers, manage my time, and meet mentors with where they are at.

2. Epidemiological-Based Research

Previous research experiences I've had have been very focused on a certain population or was very niche. To be able to focus on a large population requires a lot of consideration with how you look and analyze the data.

3. Knowing What To Study

Not all research questions are good questions, or questions that people will care about. Something that is interesting may not be novel, or something publishable. Research is an institution just like anything else and there are certain considerations into what makes a good research question.

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