The Effect of Isolation on the Mental Health of Older Adults

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Abstract

As individuals age and lose mobility and cognitive functioning, many require full-time care which their loved ones are unable to provide. This often results in placement into long-term care facilities, and these facilities are notorious for being understaffed. Physical health becomes the only priority, depriving the client of having their mental and emotional needs fulfilled. Family and friends may decrease visitation due to distance or convenience. In 2020, the Covid-19 pandemic closed the doors of many facilities to nearly all visitors. Thus, the only individuals the residents of these facilities experienced interaction with were overworked staff members looking intimidating in their personal protective equipment (PPE). This led to accelerated physical and mental decline. Continuing research is essential to discover strategies to curb this decline as the world struggles to return to normal and to prevent similar deterioration in the event that there is a resurgence of Covid-19 or future pandemics.

Keywords: long-term care, covid-19, pandemic, mental health, isolation, elderly, Alzheimer's disease, dementia

The Effect of Isolation on the Mental Health of Older Adults

In 2020, the world changed dramatically because of the Covid-19 pandemic. The average individual's normal lifestyle was greatly altered due to the Centers for Disease Control and Prevention's precautions of six-feet social distancing, mandatory mask wearing in public places, and closure and quarantining throughout the world. The elderly population was one of the most affected populations as they were thought to be the most vulnerable to the disease. As nursing homes and other facilities for the elderly closed their doors to the public to keep these residents safe from the virus a whole new set of issues arose (Jasemi et al., 2017).

The physical and mental states of older adults declined. They were isolated from their families and friends. Stimulating social conversation and basic human interactions were essentially cut off. Their daily routines changed overnight and the activities they previously enjoyed became nearly inaccessible to them. This population became depressed, and mortality rates rose. Rather than experiencing rest and peace in their final years, they were afraid and lonely. These changes affected neurological pathways and physical abilities. Both the mentally sound and those suffering with dementia or Alzheimer's disease were impacted in various ways (Jasemi et al., 2017).

This thesis seeks to raise awareness of the needs of older adults. Nursing is tasked with providing holistic care to its patients. Holistic care is a philosophy that arose from humanitarian concepts. It has been used in nursing as a blueprint to guide patient care through the understanding that good patient care includes physical, psychological, mental, and spiritual dimensions. It is easy to focus on the physical wellbeing of the client in the clinical setting, but incorporating psychological, mental, and spiritual care takes discipline. Because healthcare is constantly changing, it is necessary that healthcare professionals utilize research to improve their

profession. This paper will explore possible solutions to slowing mental and physical decline in older adults living in long-term care facilities (Jasemi et al., 2017).

History of Long-Term Care Facilities

When America was founded, long-term care did not exist. Family members and loved ones cared for the elderly at home until they passed away. This was difficult to do as homes were small and space was often limited. Young children worked alongside their family six days a week leaving no one to care for elderly relatives. As a result, older adults might be placed in poor houses or mental facilities. This situation necessitated a solution for better geriatric care (National Care Planning Council, 2018).

During the 1900s, nurses began entering homes to ease family burdens and allow older adults to remain in the comfort of their own home. The construction of "rest homes" also began developing at this time. These buildings were paid for by public donations and government aid. In August, of 1945, President Franklin Roosevelt enacted the Social Security Act which provided money to retired workers over the age of 65. A portion of the funds generated by this act were allocated for the construction of nursing homes across America (National Care Planning Council, 2018).

Difference Between Assisted Living and Nursing Home

The needs of the elderly are varied. Some older adults feel safer simply knowing that someone is nearby to watch over them and to be available should an accident occur while others rely on the care of medical professionals for their very survival. Many of these older individuals are mentally compromised which prevents them from understanding and providing for their daily needs. Additionally, some individuals have extensive medical needs requiring equipment that is not readily available at home. These groups are divided between assisted living facilities and

nursing homes to provide the best care possible by trained staff (Tennessee Health Care Association, 2021).

Assisted living provides individualized housing, personalized supportive care, and specialized medical care as needed. Although some scheduled care is provided, the resident is typically aided as requested with activities of daily living (ADLs). ADLs include bathing, dressing, grooming, toileting, eating, getting in and out of bed or a chair, walking, and medication reminders. However, these residents usually have the capability of providing some care for themselves. Medical and health services are available when needed. Residents have private apartments furnished with personal items from home and are allowed to access common areas. Assisted living facilities strive to create a home-like atmosphere to increase quality of life while boosting independence. The staff often provides laundry, cleaning, and food services as residents may no longer have the strength or energy to complete household tasks (Tennessee Health Care Association, 2021).

Individuals residing in nursing homes or skilled nursing facilities (SNF) are provided with around the clock care to meet nursing and medical needs. In addition to requiring help with ADLs, residents often need complex medical care or rehabilitation. These individuals have semi-private rooms and are allowed access to community areas depending on their own level of mobility. The care of these clients is provided in a primarily clinical setting with a focus directed at health and safety rather than recreational activities. Regardless of which type of facility an elderly individual resides in, it is quite different from the home in which they spent the majority of their life. This can cause anxiety and frustration that the medical staff should strive to alleviate in order to make the transition to a new lifestyle as comfortable as possible (American Senior Housing Association, 2021).

Elderly Population

According to the United Nations' Department of Economic and Social Affairs Population Division, one in eleven people across the globe was over the age of 65 in 2019. Researchers predict that this population will experience substantial growth, reaching one in six individuals over the age of 65 by the year 2050. Longevity has been steadily increasing in all countries around the world. In fact, in over 17 countries, one fifth of the population is composed of elderly citizens. The United Nations projects this will increase to 155 countries by the year 2100 (United Nations, Department of Economic and Social Affairs, Population Division, 2019).

Similar statistics and projections apply to the elderly population in the United States. In 2013, Americans over the age of 65 comprised 14.1% of the total population. This number is projected to grow to 21.7% by the year 2040.With the rapid increase of this population, it is important to prepare for their future care (Hullinger & Puglielli, 2017).

Population and Cost of Long-term Care Facilities

The most up-to-date information available on American adults over 85 years of age residing in long-term care facilities is based on data gathered in 2021. On average, seven out of ten Americans require assisted living care in their lifetime. More than 810,000 people are currently living in assisted living facilities, and it is predicted that this number will double by 2036 and triple by 2049 (United Nations, Department of Economic and Social Affairs, Population Division, 2019).

Currently, there are 30,000 assisted living facilities operating in the United States. Each facility houses approximately 27 to 33 residents. To handle the projected increases, the United States would require an additional one million senior living facilities. On average, 2% of seniors live in assisted living facilities and pay approximately $4,300 a month to live there. Additionally,

4% of seniors live in nursing homes and pay approximately $9,000 a month to have a private room. Alternatively, hiring a home health aide to work 44 hours a week typically costs $4,576 a month (Rubin, 2022).

Vulnerability of Elderly Population

Economic Vulnerability

Older adults are vulnerable in multiple ways. Many elderly adults suffer from a chronic illness which can significantly increase their cost of living. Therefore, they may stop taking essential medications, skip meals, or eliminate other necessary items from their lives to decrease expenses, further worsening their health. Economic insecurity may be a result of the time period in which they grew up. When these individuals were part of the workforce, salaries were much lower than they are today, and inflation has made the money they earned even less valuable. Moreover, many of their employers did not provide their employees with pensions or saving plans for retirement. Unfortunately, even when experiencing financial hardship, elderly people are often too proud to borrow money or ask for assistance (Adisa, 2019).

Cognitive Vulnerability

Aging is usually accompanied by mild changes in cognition caused by decreased speed and focus, leading to some forgetfulness. Additionally, certain diseases of the brain such as Alzheimer's disease and dementia may intensify mental decline. This forgetfulness can be exploited by dishonest persons to manipulate the elderly. Reminders of previous episodes of forgetfulness can cause them to feel incapable of performing certain tasks. Predators may claim that something was said or occurred that did not actually happen and convince elderly individuals that they forgot the details of the situation. This can give corrupt individuals significant power to defraud or harm them. Although this manipulation may not directly injure

the elderly, it can considerably decrease their quality of life. This is particularly true of patients with dementia who quickly forget events that have just occurred making them prime abuse victims since they are unable to remember the abuse or report it through the proper channels (Palomo, Alvarez, & Terrón, 2020).

Cognitive Decline of Older Adults

Noticeable Decrease in Skills

Cognitive abilities are generally divided into two categories: crystalized abilities and fluid abilities. Crystalized abilities are composed of skills and knowledge that have been acquired throughout an individual's lifespan. In contrast, fluid abilities refer to the cognitive manipulation of information to find a solution to a problem. Crystalized abilities typically improve until one's early 60s, then remain relatively constant until an individual reaches their 80s. Fluid abilities, however, tend to regularly decline from age 20 to age 80. This is evidenced by the decreased processing speed of information (Murman, 2017).

Cognitive domains that are frequently studied include attention span, memory, executive cognitive function, language, and visuospatial abilities. Declines in these domains are measurable using various tests and observation. Throughout the normal aging process, most memories are stable. Thus, cognitive decline is most readily evidenced by difficulty in learning new skills or concepts. Sensory, or immediate memories, are stable with aging but with decreased capacity compared to younger adults. Historical or episodic memory is also stable with aging; however, recall of the source and details of the information does decline. For older adults, the inability to manipulate information or focus on more than one activity at a time is evidence of cognitive decline. Executive functioning which includes decision making, problem solving, planning, and multitasking also declines as age advances. Since these processes are managed by

the prefrontal cortex, their impairment demonstrates this portion of the brain's decline (Murman, 2017).

Normal aging does not affect an individual's speech or language capabilities. In daily conversation, an adult of advanced age should have an intact vocabulary, sound verbal reasoning, and good speech comprehension. However, if a conversation is accompanied by significant background noise or unclear speech, this decreases an older adult's comprehension levels. Due to decline in the central nervous system (CNS), they are no longer able to filter through the noise and focus on the conversation. An older adult's visual recognition of objects, shapes, gestures, and conventional signs remains constant. Nevertheless, visual perceptual judgment or the ability to discern objects in space does decline. This contributes to the number of falls experienced by the elderly. Creativity also exhibits a noticeable decline, suggesting deterioration in the right hemisphere of the cerebrum (Murman, 2017).

Physiological Evidence of Decline

Like other organs throughout the body, the brain undergoes aging due to factors such as oxidative stress, mitochondria dysfunction, and dysfunctional protein homeostasis. However, certain aspects of aging are unique to the brain. For example, amyloid plaques or misfolded proteins collect in the spaces between nerve cells. They begin formation in the parts of the brain responsible for memory and other cognitive functions. Although this is closely associated with AD, some plaque growth is associated with normal aging. Astrocytes and microglia also increase in number with age. Increased proliferation of these cells can lead to neurodegenerative disorders such as Alzheimer's disease (AD). Mitochondria functionality decreases with age due to oxidative damage caused by reactive oxygen species (ROS). This impairment results in

decreased oxidative capacity, oxidative phosphorylation, adenosine triphosphate (ATP), and antioxidant defense (Hullinger & Puglielli, 2017).

Additionally, mitophagy and autophagy processes are interrupted, leading to a reduced removal of dysfunctional mitochondria. The regeneration time of neurons slows down as an individual ages. These cells are responsible for carrying messages to and from the environment. Neurofibrillary tangles or tau proteins collect inside of neurons, damaging the normal internal structures that nourish the cell. Vascular integrity decreases as vessels throughout the brain become atherosclerotic or stiff increasing risk for brain bleeds. Collectively, the synapses and size of the brain decreases (Hullinger & Puglielli, 2017).

The brain is composed of substances known as white and gray matter. The cerebral cortex, cerebellar cortex, and subcortical nuclei are predominately composed of gray matter. These areas are filled with cell bodies and dendrites. White matter is primarily formed of myelinated axons that connect the gray matter. Both of these substances are significantly affected by aging. The majority of gray matter lost originated in the prefrontal cortex. The temporal lobe which houses the hippocampus also shows moderate decline in gray matter. White matter loss is primarily seen in the prefrontal cortex and corpus collosum. Any remaining white matter generally shows evidence of decreased integrity. These structures are studied using brain imaging via computed tomography (CT) and magnetic resonance imaging (MRI). Recent advances in these technologies allow for a closer view to link speculation to fact (Farokhian et al., 2017).

Neuronal loss has been found to consist of only 10% of the neurons present in young adulthood. Cortical neurons are predominantly lost in the dorsal lateral prefrontal cortex, hippocampus, and greater subcortical region, with minimal losses in the substantia nigra and

cerebellum. This loss is more significant in those suffering from AD. Neurons lost during normal aging do not typically die but rather undergo a change in structure. The neurons that are lost lead to a decrease in the number and length of dendrites, dendritic spines, and axons, as well as a significant loss of synapses. There is an increase in the segmental demyelination of axons, causing the transmission of messages by the nerves to slow down substantially. When message transmission slows down, the physical response becomes delayed. Consequently, physical symptoms aid in the diagnoses of brain diseases (Murman, 2017).

Disease-Related Cognitive Decline

Possible Causative Factors

Not all cognitive decline is normal. Damage to the brain from cerebral ischemia, head trauma, toxins, excess stress hormones, or the development of a degenerative dementia such as AD can lead to exacerbated cognitive declines not expected in normal aging. Cerebral ischemia can result from events ranging from injury sustained at birth to strokes. It is caused by oxygen deprivation to a part of the brain for a prolonged period which leads to tissue injury. Brain damage is irreversible because brain cells are non-regenerative. Head trauma can cause either direct damage or delayed damage due to increased intracranial pressure (Stradecki-Cohan, 2017).

Brain cells may also be killed, disrupted, or damaged by environmental toxins. The amount of damage is dependent on the type of toxin in the body. In adults, the most common toxin that affects the brain is alcohol. Alcohol is particularly dangerous as it can pass the protective blood brain barrier. This allows entrance into the central nervous system to act on areas of the brain that are susceptible to chemical changes. It is a common misconception that alcohol only temporarily affects the brain, causing no permanent damage. However, alcohol abuse has been proven to cause the white matter in the cerebellum to atrophy. Alcohol can affect

neurotransmitters which are responsible for sending messages throughout the brain. This reduced rate of message transmission in the brain may cause behavior change and slowed motor function. Although impaired judgment, slurred speech, and emotional variability are temporary effects of drinking, the centers that control these functions may become permanently changed as the result of alcohol abuse (Velentza et al., 2019).

Chronic and repeated stressors are major triggers for constant inflammation throughout the body. Although the blood brain barrier normally protects the brain from molecules circulating throughout the body, stress can decrease the integrity of this barriers, allowing inflammatory proteins to enter the brain. Since the hippocampus is particularly vulnerable to these proteins, learning and memory may be significantly impacted. The hormone cortisol is released when the body is under stress. Prolonged high levels of cortisol have been associated with shrinking of the hippocampus. There are high rates of depression in individuals with chronic stress due to the changes in brain chemistry and physical response (Sahakian, Langley, & Kaser, 2020).

Alzheimer's Disease

Diagnosis

AD is not a part of the normal aging process. It is an irreversible brain disorder that develops over a span of several years. It is the most common type of dementia. The pathology of AD is not fully understood by scientists. Although this pathology is frequently diagnosed in patients, its presence can only be confirmed by a postmortem autopsy. To be diagnosed with this disorder, a patient must be screened by a healthcare provider using the criteria listed in the fifth publication of diagnostic and statistical manual. This publication is updated by the American Psychiatric Association every few years (American Psychiatric Association, 2013).

According to the American Psychiatric Association, diagnosis of AD first requires evidence of some degree of impaired mental functioning. This impairment must have developed gradually and affect one or more areas of the brain. The number of areas affected by the disease helps to determine the severity of the illness. Memory and learning must show deterioration that is not related to other neurological, psychological, or medical problems (American Psychiatric Association, 2013).

Pathology

Although the cause of AD is not yet fully understood, there is a recognizable pattern to the pathology. Cellular changes in the brain which are associated with AD have been found to occur as early as ten years before the onset of symptoms. There is a sharp decline in the availability of neurotransmitters in the brain. The axons and synapses are either damaged or destroyed. This results in decreased attention span, impaired memory, slowed learning, and a decline in higher cognitive abilities. Although the cause of the damage cannot be confirmed, it is suspected that neurotic plaques and neurofibrillary tangles are to blame. Neurotic plaques are composed of amyloid-beta which is formed from misshapen pieces of amyloid precursor protein (APP). APP is a fibrous protein typically found in synapses of the neurons. When amyloid-beta is in its soluble form, it binds to neuronal receptors which erodes the synapses. On the other hand, the insoluble form clumps and is less toxic (Murman, 2017).

In rare cases, AD can be the result of genetic mutations. Damage to the gene apolipoprotein E (APOE) which is responsible for lipid transport and injury restoration in the brain is a possible risk factor. Individuals who have the E4 allele have a greater risk of developing AD than individuals carrying the normal E3. In contrast, the E2 allele decreases the risk of developing the disease (Hopperton, 2018).

Both degenerative and genetic mutated AD, begin with damage to the hippocampus leading to the loss of recent memory and the inability to recognize familiar objects. The cerebral cortex is also affected impacting the patient's ability to perform certain cognitive tasks and apply problem-solving skills. This is often due to the buildup of B-amyloid protein on the outer surface of the neuron which leads to cell injury or death. The accumulation of this substance also blocks the synapses of the brain. In addition to protein accumulation around the neuron, protein tau also begins to fill the inside of the neuron blocking nutrients from nourishing the cell. The brain also shrinks. However, it is unclear whether this is the result of normal aging or accelerated deterioration caused by AD. These changes do not always indicate that AD will develop, but they are considered to be risk factors. Physical injuries and illness such as cardiovascular disease, head injury, or traumatic brain injury may correlate to the development of AD, but this theory has not been definitively confirmed (Gao et al., 2021).

Symptoms

The presentation of AD depends on the severity of the disorder. Mild forms present with decreased energy, drive, initiative, and ability to learn. Moderate AD is often presents with frustration, confusion, and unexpected actions. Patients may forget personal information, dress inappropriately, experience trouble sleeping, wander aimlessly, and become suspicious of others. As the disease progresses, the patient forgets familiar objects or faces and needs repeated direction. This lack of memory can lead to regressive behaviors. Patients may use confabulation or stories to preserve their dignity. They may have agraphia, aphasia, apraxia, or agnosia. Alzheimer's patients tend to put objects in their mouth (hyperorality), requiring constant monitoring. They may also display hyper-metamorphosis by repeatedly tracing walls. These behaviors intensify later in the day in a process called "sundowning." These behaviors cause

those suffering with AD to be misunderstood. Because some of these actions are considered rude and inappropriate, the typical response is to attempt to change the behavior using punishment. However, the brain no longer processes reward and punishment properly since the limbic system is also affected by AD. Often, others perceive the individual to be "gone" or lost to the disease, making the individual non-relational and a waste of time (Lanctot, 2017).

Treatment

There are currently a few medications available to treat AD. The most common drugs are cholinesterase inhibitors and N-methyl-D-aspartate (NMDA) receptor antagonists. Cholinesterase inhibitors prevent the breakdown of acetylcholine, temporarily decreasing AD symptoms. NMDA receptor antagonists work by regulating glutamate which is vital for information processing, storage, and retrieval. They also prevent excessive stimulation of neurons. These medications can be effective for a short period of time if taken consistently. However, if doses are forgotten the disease can regress to the same severity as though the medication was never taken to begin with (Halter, 2018).

Covid-19 Pandemic

Definition

The coronavirus pandemic began in 2019 with the spread of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) that originated in Wuhan, China. Attempts to contain and stop the virus failed, leading to a global pandemic. On January 30, 2020, the World Health Organization (WHO) declared an international public health emergency and followed up by officially proclaiming the situation to be a pandemic on March 11, 2020. Covid-19 has quickly risen to become one of the deadliest viruses in history, amassing over 541 million cases and 6.32 million deaths (Wiersinga et al., 2019).

Effects of Fear

Since the virus was very deadly, multiple precautions were put in place to prevent its spread. These safeguards included social distancing by six feet, wearing masks and other personal protective equipment (PPE), and staying at home to avoid contact with others whenever possible. Following these requirements created an environment of isolation. Daily routines and lifestyles changed drastically. Curfews were implemented. Businesses were shut down if they were deemed nonessential. Traditional gatherings of families and friends were either prohibited or individuals were too frightened to attend. Individuals around the world were subjected to mandatory or voluntary isolation. This instigated fear of any form of physical contact as individuals became terrified that they would contract the virus and die (Adolphs, 2013).

Fear is first experienced in the mind and then triggers a physical response. Once fear is recognized, the amygdala alerts the nervous system. Stress hormones such as cortisol and adrenaline are released into the blood stream which leads to rapid breathing, accelerated heart rate, and increased blood pressure. Blood flow to the extremities is increased to prepare the body to fight or run. The cerebral cortex becomes impaired, leading to poor decision making and poor judgment. If fear is not alleviated, the hypothalamic pituitary adrenal axis (HPAA) remains stimulated which results in the prolonged circulation of stress hormones. These hormones put certain parts of the body on high alert while shutting others down to compensate. This causes a decline in immunity, inflammation, and digestion. During the pandemic, immunity was repressed due to fear of the virus circulating the globe. Thus, individuals were more susceptible to Covid-19 and mortality rates were high (Adolphs, 2013).

Resident Experiences

When individuals were sick during the pandemic, there were strict visitation restrictions.

Without physical support hopelessness set in. Patients died alone because family and friends were not allowed to visit. Even after death, bodies were often inaccessible since they were deemed to be contaminated by the virus. There was no closure for the living (Abbasi, 2020).

Many people lost their jobs or their businesses due to lack of customers. Children were sent home from school, so parents struggled to work their jobs and manage childcare and education. They did not hire sitters for fear of bringing the virus into their homes. Nursing homes and assisted living facilities were closed to the public to protect the elderly (Abbasi, 2020).

Despite the precautions, many became ill. Although facilities for the elderly were able to keep Covid-19 out for a while, it soon began circulating through them. Residents would become very ill and be confined to their rooms. Many failed to thrive in this isolated environment and developed depression and anxiety. In memory care, it was nearly impossible to socially distance the residents due to their lack of understanding concerning the situation. A single caretaker was typically designated to dress in full PPE to care for the needs of the infected to limit exposure. It is important to note that wearing a mask and face shield impair the travel of sound. Thus, when working with patients who are typically hard of hearing, it becomes nearly impossible to communicate effectively. The PPE also interfered with lip reading and interpretation of facial expressions (Chen et al., 2021).

Family members attempted to remain in contact using FaceTime, phone calls, or window visits. However, each of these options resulted in frustration due to hearing limitations. It became necessary to supervise window visits after they were repeatedly found open, defeating the purpose of the barrier. The only interaction that residents had with other human beings was the caregiver covered in PPE who entered the room for a few minutes every two hours unless there was a need for additional assistance. As the pandemic progressed, fear and frustration increased.

In individuals suffering with AD and dementia, these conditions were intensified. They were particularly difficult to quarantine because they did not understand why they could not leave their rooms. Often, they refused medications out of confusion which caused increased suffering (Abbasi, 2020).

Caregiver Experiences

When the pandemic began, healthcare workers were reluctant to continue working and risk bringing the virus home to their families. New rules and regulations placed on staff made their jobs more difficult. This already understaffed field lost many employees resulting in long hours of overtime for those who remained. The staff were overworked and underpaid. Much needed supplies became unavailable. Sometimes masks were utilized for weeks rather than one day as intended to ensure they did not run out. This placed the staff at an increased risk of catching the virus. Healthcare workers developed headaches from the smell of the mask and from the straps pulling on their ears for hours on end. Wearing an N95 mask, face shield, hair net, gown, gloves, and booties, caused them to become overheated. The already hot rooms made this condition worse. It is difficult to undergo this level of discomfort for extended periods of time. Therefore, caregivers focus on completing tasks quickly and moving on to the next assignment. This created a very goal-oriented mindset rather than a caring attitude. Because the staff were overwhelmed, there was never enough time to call and update families concerning their relatives (Chen et al., 2021).

Physical Effects of Covid-19

Symptoms

Symptom of Covid-19 begin to appear between two to fourteen days after exposure to the virus. Common symptoms include fever or chills, cough, shortness of breath or difficulty

breathing, fatigue, muscle or body aches, headache, new loss of taste or smell, sore throat, congestion or runny nose, nausea or vomiting, and diarrhea. If the patient experiences trouble breathing, persistent pain or pressure in the chest, new confusion, inability to wake or stay awake, and pale, gray, or blue-colored skin, lips, or nail beds, depending on skin tone, they need emergency medical attention (Chatterjee, 2022).

Pathophysiology

The Covid-19 is spread by the SARS-CoV-2 viral strand that attaches to epithelial cells in the nose and bronchi. The viral spike protein binds to the angiotensin-converting enzyme 2 (ACE2) receptor 7. Type 2 transmembrane serine protease (TMPRSS2) which is found in the host promotes viral uptake by anchoring ACE2 and stimulating the SARS-CoV2 spike protein which allows the virus to enter the host cell. This virus kills T lymphocytes leading to severe lymphopenia. The virus also triggers inflammatory responses from both the innate and adaptive immune systems. Lymphocytes become inhibited from replicating, and the old cells undergo increasing apoptosis. As viral replication accelerates, the barrier between epithelial-endothelial cells becomes compromised. The pulmonary endothelial cells are affected in a similar way, heightening the inflammatory process, and activating the influx of neutrophils and monocytes. Together, dead cells, inflammation, and edema accumulate in the alveoli leading to poor gas exchange which results in acute respiratory distress syndrome (ARDS) (Weirsinga, 2019).

Long-Term Effects

After recovering from Covid-19, some individuals begin to experience long-term health issues. Older adults and those with serious medical conditions were the most likely to experience continuing issues. Some re-experienced symptoms of the infection. Others experienced organ damage following the disease. Since the lungs received the most damage during the infection,

many individuals who had never before needed oxygen now required continuous nasal canula. The heart, kidney, and brain also experienced long-term deficits due to the low oxygenation status at the time of infection as well as medications administered to cure the virus (Chatterjee, 2022).

Some individuals experienced multiple organ inflammatory syndrome in which different organs became inflamed following the infection. It was also discovered that Covid-19 led to an increased likelihood of blood cell coagulation also known as blood clotting. These clots have resulted in complications such as heart attacks and strokes. Serious tissue damage may also occur in the lungs, liver, legs, and kidneys because of the clotting. Additionally, the Coronavirus can weaken the blood vessels leading to persistent leaking. This leakage can contribute to continuing issues with the liver and kidneys. Survivors often experience continuing fatigue and depression as a result of the physical toll taken on the body by the virus and changes in the brain due to oxygen deprivation and traumatic experiences. Since this virus is still relatively new, the extent of long-term effects remains under investigation at this time (Mayo Clinic, 2020).

Higher Risk for Older Adults

The immune system naturally becomes weaker with age. This makes it more challenging to fight off an infection. With age, the production of T and B cells housed in the bone marrow and thymus naturally decreases. The mature lymphocytes locate in secondary lymphoid tissue also decrease in their functioning abilities. With inflation, many families had difficulty keeping their loved ones at home as they could no longer afford home health. This issue brought many to live in facilities. Even with rules in places living in a place with several other people increased the chance of exposure. In facilities with Alzheimer's and dementia social distancing was not possible as the residents did not understand what was happening. The caregivers tried to not

become exposed so as not to bring the virus back to the residents. However, the travel to and from the facility increased their chance of exposure. The individual infected often did not know before they had exposed others as symptom onset was delayed (Montecino-Rodriguez, Berent-Maoz, & Dorshkind, 2013).

Importance of Socialization

Health Effects

Lack of social support and interaction has been compared to having as great an impact on one's health as known risk factors such as smoking, alcohol consumption, obesity, and physical inactivity. Socialization has been found to improve an individual's health by reducing the risk of infections, cardiovascular disease, certain cancers, and cognitive decline. In contrast, isolation is associated with deteriorating health, loneliness, and cognitive decline. Close social ties often include a spouse, children, other family members, and close friends (Hawkley & Capitanio, 2015).

Currently, almost every person with few exceptions meets other individuals every day. However, the social need is not fulfilled if there is not a relationship with those individuals. It is possible to be surrounded by crowds every day and still be lonely. Although loneliness affects an individual in different ways across the lifespan our focus centers around older adults. Everyone has different social needs. Social satisfaction is based on the trust that is in the relationship. Ultimately loneliness is the individual's perspective on whether his social needs are fulfilled (Hawkley & Kocherginsky, 2018).

Biblical Need

The human species was made to be a social creature. In Genesis 2:18 God said, "And the Lord God said, it is not good that the man should be alone; I will make him a help meet for

him. This verse is often used in reference to a marital relationship; however, it shows mans need for deep relationships. Community is a Christian concept. In Romans 12:4-5, the scripture explains that we are to function in different roles for a common purpose. Our own creator understands our needs above any other.

Psychological Viewpoint

Abraham Maslow, a famous American psychologist, created a pyramid diagraming the needs of a human being with the base containing the most basic needs. The foundation of the pyramid is the physiological needs. This includes things such as the following: air, water, food, shelter, sleep, clothing, and reproduction. The step above physiological needs is the need for safety. This not only includes personal security but also ability to maintain health, employment, and resources. The third basic need is the need to have love and belonging. Facilities for the elderly are often competent in providing the physiological and safety needs of their residents, however, they often fall short on love and belonging (Dwivedi & Badge, 2021).

Socializing has its costs and benefits. Historically, being social can lead to competition. When connecting with another individual and learning about their life and possessions, it is in our human nature to become jealous. This can lead to dissatisfaction with life and possibly social withdraw. When we become close with another individual, it is common to share personal information that can lead to possible exploitation. Another concern that is particularly relevant to the current time is the risk of exchanging pathogens that could lead to serious illness. These factors can deter individuals from forming close and meaningful connections with each other. Although there are downsides to engaging in a social relationship, there are positives. Having a close friend group provides a person with assistance in times of need. There is also a certain protection that comes from knowing individuals with varying skills and of varying status

(Cacioppo, Cacioppo, Capitanio, & Cole, 2017).

Effects on the Brain

Studies have been performed to understand the effects of isolation on the brain. Michel Siffre, a French scientist, shut himself in a cave for six months and journaled about his experience. He noted that his thoughts were "hard to string together." He expressed being so desperate for interaction that he tried to make friends with a mouse living in the cave. Space and Antarctic explorations have also produced evidence concerning the effects of prolonged social isolation. Although these are extreme cases, they provide proof that isolation affects the brain. According to scientific studies, loneliness leads to a decrease in the size of the prefrontal cortex which affects decision making and social behavior. Studies on people and animals have also revealed decreased hippocampal size and reduced brain-derived neurotrophic factor (BDNF) which have been associated with memory loss and decreased learning. Researchers discovered a correlation between the size of the amygdala and an individual's social group. Although the brain is too complex to fully understand, changes do occur when individuals are isolated or lonely (Offord, 2020).

Reduced Staff Interaction

Staffing issues in healthcare have existed for several years. However, the pandemic exacerbated the shortage. Staff members were absent because of their own illness or quit because they feared for the safety of their family members. Healthcare workers developed high levels of burnout from watching so many suffer or die and dealing with the multiple precautions required to prevent the spread of Covid-19. As workers left, others worked extended hours until they too became exhausted. This was especially challenging in long-term care facilities because the residents were often impatient and scared when they lost access to their families and spent long

hours alone in their rooms. Because the staff were exhausted, they were not able to meet the residents' need for love and belonging (Ely, 2018).

PPE was often in short supply with single-use, disposable items being re-used to stretch supply. This put workers at an increased risk of contracting the virus. Unfulfilled promises were made for improved staff to resident ratios and hazard pay that was never paid leaving staff feeling disgruntled. Paid time off and vacation time were lost as employers refused to approve time off due to short staffing. Currently, these benefits remain uncompensated in several facilities. Many facilities for the elderly even brought in help from temporary agencies at nearly double the staff pay to do the same jobs because employers could write this compensation off as emergency expenditures and obtain government assistance. This meant that residents were being cared for by individuals who did not know them (Ely, 2018).

Physiology of the Brain in Conversation

The brain regulates the physiological processes that occur in the body. To maintain adequate functioning, it needs to be used regularly. A primary source of mental exercise is the use of conversation. It is important to understand that a conversation consists of more than a simple exchange of information. During conversation, the brain undergoes physical changes that produce an emotional response. Hormones and neurotransmitters produced by the brain stimulate the body's nerve pathways, changing the chemistry of the body. These neurochemicals can make the individual feel good or bad. Conversations associated with a "good feeling" usually results from high levels of dopamine, oxytocin, and endorphins (Glaser, 2019).

Within a few minutes, a conversation can trigger millions of neurochemicals which influence one's state of mind. Multiple brain structures are utilized when conversing. The amygdala which is commonly referred to as the center of emotion helps the body determine if a

stimulus is pleasurable or dangerous. The prefrontal cortex which is most closely associated with an individual's personality is the part of the brain that has a central role in cognitive control. When the prefrontal cortex is stimulated by dopamine, the functions of attention, impulse, inhibition, and memory are activated. Therefore, conversation not only has the power to regulate and change the chemistry of the brain but also helps to relate to and bond with the person one is conversing with. The brain is full of neurons known as mirror neurons that stimulate the same areas of the brain that are being utilized by the individual one is looking at. This allows an individual to imitate the motor actions of others. This ability confirms that the brain was created to be social (Glaser, 2019).

A study was performed using naturally social animals. These animals of different ages were placed in isolated housing for various durations. Their isolation resulted in behavior changes such as anxiety, depression, aggression, passivity, and cognition/memory impairments. Their physiology also underwent changes in basal or stress–reactive corticosterone, blood pressure, inflammation, immune responses, or hippocampal function. Similar studies were performed with humans of various ages. After a period of isolation, questionnaires and test administered to the subjects. These assessed mental health, sleep, executive control, self-reported health, and utilization of healthcare, as well as cognitive, immune, neuroendocrine, and inflammatory functioning. Those who reported feelings of loneliness also experienced depressive symptoms, poor sleep, impaired emotional control, poor health, impaired immunity, increased cortisol levels, and an increased pro-inflammatory response. Throughout one's lifespan there is an innate drive to improve one's status and self-esteem through work and contributions to society. This does not change in late adulthood. According to the National Social Life Health and Aging Project, adults between the ages of 57-85 who continued to work had lower levels of

loneliness than those who retired from their jobs (Hawkley & Capitanio, 2015).

Loneliness is the result of decreased self-worth, connectedness, and belonging. The breakdown of social structure leads to decreased mental, physical, and general well-being. Lonely individuals display depressive symptoms including less restful sleep and daytime fatigue. They place less effort on maintaining positive emotions. This maladaptive habit can lead to decreasing self-control in other areas of life (Hawkley & Capitanio, 2015).

The intensity of loneliness experienced by an individual was closely linked to their general cognitive ability, processing speed, and memory. Lonely adults were found to be at a greater risk for developing dementia. They were found to have poorer health and an increased risk of needing to be admitted to a nursing home. It was also discovered that because isolated individuals were no longer continually exposed to viruses and bacteria their immune system was not exercised regularly. Therefore, when a serious infection occurred, the body would not be able to mount the proper response (Hawkley & Capitanio, 2015).

The pandemic often limited the amount of time residents had available to be outside their rooms. The facilities wanted to keep things fair and did not want more then two or more individuals in the hallways or in the facility courtyard. These numbers were often filled by staff leaving no room for a resident to explore. This led to depression from staring at four walls for countless days. Several outside services such as therapy and hospice were not allowed in. These residents did not get an exercise which resulted in noticeable physical decline. Those who were able to walk on their own required more assistive devices or became wheelchair bound. Basics taken for granted like fresh air and sun light were taken away (Park et al., 2020).

Essential Modifications

Staffing Adjustments

Healthcare workers may become overwhelmed by the magnitude of the problem. However, changes must be made to improve future care. This is especially important as other outbreaks such as monkey pox threaten the world. Health care has been in "Covid-19 mode" for so long it has nearly forgotten how to provide holistic care. Many long-term care facilities have not yet reactivated daily activities and outings. Facilities must begin organizing safe activities to decrease isolation. They need to take better care of their staff so the staff can better care for their residents. This includes better pay and regular time off. Others will be inspired to work in a facility where they know they will be cared for and appreciated. When a facility has high-quality staffing, it can focus on caring for its residents. Currently, staffing is the main hinderance to proper care. The discrepancy between wages paid to agency workers and facility staff must be eliminated (Ely, 2018).

Linda Aiken, a registered nurse and professor at Pennsylvania School of Nursing, has done extensive research on the effects of staffing on patient outcomes. Although her research is centered in the hospital setting, it has valuable insights on how nurse education levels and nurse-patient ratios impact patient mortality rates. Aiken found that mortality rates in the thirty days following a routine surgical procedure increased by 7% for every additional patient assigned to a nurse. Additionally, she discovered that for every 10% increase in nursing staff with a Bachelor of Science in nursing (BSN) the risk-adjusted mortality dropped 5 to 7%. Her research clearly shows that involving nursing staff in facility decision-making results in better patient outcomes (Aiken, 2021).

Suggested Interventions

Williams et al. (2021), performed a systematic review of literature on isolation and loneliness to investigate possible solutions for decreasing isolation during the pandemic. This review categorized its findings into feasible and non-feasible interventions under Covid-19 restrictions. Non-feasible interventions involved physical contact, whereas feasible interventions included online activities and animal therapy. Although advancements in technology are remarkably helpful for certain age categories, older adults may struggle to use the technology or be limited due to hearing issues. This review also explored the effectiveness of robotic pets and psychological therapies. Most of the interventions were not found be effective in combating social isolation, although a few resulting in minor and temporary relief (Williams et al., 2021).

Although Covid-19 is still prevalent, facilities are attempting to open their doors to combat isolation. Some facilities have allowed small groups of residents to meet again for meals and activities. On Sundays, pastors have been allowed to preach behind a glass screen. This has improved spiritual health restoring hope for the future amidst the fear. Families who have undergone Covid-19 screenings are allowed to visit in patients' rooms wearing masks. Healthcare is realizing that poor mental health can be just as deadly as physical diseases. Although things may never return to "normal," the goal is to get as close as possible while maintaining safety for this population (Centers for Disease Control and Prevention, 2022).

Discussion

Problems associated with the Covid-19 pandemic were primarily due to lack of preparation. When the Duke Global Health Institute researched the history of pandemics, they were shocked to find that these events were statistically more likely than expected and prior research may have resulted in greater preparedness. They discovered a 2% likelihood of a

pandemic with the impact of Covid-19 in any given year. Because this probability increases yearly, an individual who was born in 2000 had a 38% chance of experiencing a pandemic at the time Covid-19 surfaced. Thus, it is important to begin preparing now for future pandemics. (Penn, 2021).

The elderly population is steadily increasing and is projected to grow substantially beyond what America is currently able to support (United Nations, Department of Economic and Social Affairs, Population Division, 2019). Therefore, studying the molecular mechanisms of aging and understanding physical and mental vulnerabilities is essential to providing a good quality of life for current and future generations of older adults (Hullinger & Puglielli, 2017). Residents of long-term care facilities were separated from their loved ones and normal routines during the Covid-19 pandemic. The priority for this population was deemed to be physical health. However, focusing exclusively on survival and ignoring other aspects of health increased mortality rates (Jasemi et al., 2017).

Nursing is charged with providing holistic care, but this standard of care has fallen short during the pandemic. Thus, intensive research is needed concerning how to reinstate well-rounded nursing care in the elderly population (Jasemi et al., 2017). A review of the interventions used before and during the pandemic is vital. Visitors were generally prohibited which led to isolation and increased physical and mental decline. In an attempt to curb this decline, some visitors were allowed in wearing PPE. Others were allowed to visit through the window. Some sat at tables behind plexiglass screens to decrease viral transmission. These interventions failed to consider the population being protected. Older adults are often hard of hearing. The barriers affected the transmission of sound waves to their ears. Facial expressions essential to lip reading were blocked by masks and glare from the glass. Some facilities resorted

to technology by utilizing FaceTime and other video chats. Again, the residents had difficulty hearing and often became frustrated. This frustration was compounded in individuals with memory impairment such as AD and dementia. They either did not understand or repeatedly forgot what was occurring. The facilities implementing these actions were well-intentioned in their efforts to reduce isolation. However, nothing compares to face-to-face human interaction. Unfortunately, this is not always possible. Continuing research is vital to discover methods to decrease isolation and prepare for the next pandemic (Poon & Jenstad, 2022).

Researchers must be cautious when analyzing data as there is a possibility of skewed results. When masks were mandated in America, it was obvious that not everyone wore them correctly. This even occurred in healthcare settings. Multiple interventions were implemented including barrier creams to be applied to staff and residents to decrease the spread of bacteria and viruses. There was also scheduled times to disinfect public resident areas. However, there was a critical staffing shortage and employees still had regular work obligations to fulfill. This calls into question whether these additional safety tasks were fulfilled. Therefore, one could question whether data obtained from these facilities during the pandemic may produce inaccurate information.

Conclusion

The world is changing, and it is important for the health care field to make adjustments to prepare for the care for future patients. Covid-19 is not going away. It has been resurging every few months. It is important for health care professionals to learn how to administer proper acute and post-acute care. It is especially important that we care for the individuals who helped to care for us before we were old enough to care for ourselves. Isolation is not just a physical battle. Mental health is greatly affected by social isolation, and researchers need to continue exploring

safe interventions when distancing becomes necessary. This leaves the opportunity for ongoing research.

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