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The Impact of COVID-19 on Aging Populations: An Examination of Digital Inequities and Health Outcomes in Global Health Systems

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Abstract

Background: The COVID-19 pandemic has profoundly affected global health systems, particularly impacting aging populations. The extensive protective measures, while necessary, have exacerbated existing health disparities and introduced new challenges for the elderly, who are at heightened risk for severe outcomes related to the virus.

Methods: This review synthesizes current research on the psychological and physical ramifications of the pandemic on older adults. It examines the implications of lockdown measures, including increased mental health issues such as anxiety and depression, and the barriers to accessing healthcare services. The analysis highlights the disparity in digital access and proficiency among older adults, which has hindered their ability to utilize telehealth services and other digital resources.

Results: Preliminary findings indicate that approximately 80% of COVID-19 fatalities occur in individuals aged 65 and older, underscoring the need for targeted interventions. The transition to digital platforms for healthcare and social interaction has created a paradox; while these technologies have mitigated some adverse effects of isolation, older adults face significant barriers to access and usage, exacerbating the digital divide.

Conclusion: Immediate and sustained efforts are required to address the digital gap among aging populations. Strategies should focus on enhancing digital literacy, increasing access to technology, and promoting mental health resources tailored for older adults. Bridging this divide is essential not only for

improving health outcomes during the pandemic but also for ensuring the long-term well-being of elderly individuals in an increasingly digital world.

Keywords: Aging Population, COVID-19, Digital Divide, Mental Health, Telehealth

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1. Introduction

As the COVID-19 crisis progresses, the extensive impacts of the virus and the protective measures implemented to safeguard the people are becoming more evident. As of the composition of this report, the cumulative count of verified viral infections has exceeded 34 million, with fatalities over 1 million and rising daily (1). The economic ramifications of this crisis have been substantial, and scholars have indicated that the impact on global economies is expected to last for years (2–5). The COVID-19 crisis has introduced a myriad of other issues, including those indirectly associated with the virus, stemming from the global lockdown measures implemented. The lockdown, while essential for viral containment, has already shown impacts that are both physical and psychological. Preliminary research indicates that the psychological ramifications of this crisis and the extended lockdown include heightened stress, anxiety, and despair (6–11).

Researchers have cautioned to prepare for a potential increase in suicide rates in the months subsequent to the crisis (12). The pandemic has hindered access to healthcare services for non-COVID-related issues in several places, leading to an increased risk of adverse consequences for those with other illnesses. The disruption of employment, fitness regimens, and pervasive social isolation are expected to significantly impact the population's well-being in the future (13, 14). Although no segment of the population will be unaffected by this catastrophe, the aged demographic is expected to endure the most severe consequences. Preliminary data indicate that around 80% of COVID-19 fatalities are among individuals aged 65 and older (15). Due to the virus's significant impact on the elderly, lockdown measures for this demographic have been more stringent and may need extension in some nations (16, 17). The elderly will be significantly affected by the subsequent adverse effects in the forthcoming months (18).

Although the alterations and limitations in everyday life are significant and evident in several instances, digital technologies and resources have been emphasized as potential methods for alleviating the most severe adverse effects. Social isolation has extensively documented adverse consequences on well-being across all age groups, with these effects being more pronounced in older persons (19, 20). Social isolation often leads to loneliness, a condition closely linked to depression in older individuals (21). Loneliness, isolation, and depression have been shown to forecast worse disease outcomes in elderly populations (22). Moreover, depression and other mental health disorders are associated with elevated death rates in those aged over 65 years. The use of technology to maintain communication with family, friends, and loved ones has emerged as a crucial method to mitigate the adverse impacts linked to extended loneliness and isolation (23).

Virtual socialization and online activities have grown prevalent, significantly mitigating full isolation during lockdowns (24, 25). The capacity to maintain communication with friends and family using online video conferencing solutions may provide people with enhanced socialization chances to mitigate loneliness. Online education has emerged as the standard in several locations, as educational institutions transition to virtual classrooms to maintain the continuity of student learning (26). Moreover, with individuals experiencing more flexible schedules and increased leisure time during the workweek, there has been a notable rise in the use of personal learning and development resources, such as language learning applications (27). Healthcare has increasingly adopted digital solutions, with the provision of both mental and physical healthcare online becoming more prevalent and effective in alleviating the adverse impacts of diminished healthcare access (28–34).

Although technology has significantly alleviated the adverse impacts of the crisis on the general population, the circumstances are more complex for the senior demographic. The access to and proficiency in technology is much lower among older people compared to younger ones (35, 36). The disparity in

electronic access and proficiency is referred to as the digital gap, or the gray digital divide, and researchers propose that it has intensified as the pace of technological innovation accelerates (37). This creates a paradoxical scenario where the people most impacted by the lockdown are simultaneously the least assisted by the digital technologies designed to alleviate the adverse consequences. This research seeks to elucidate the adverse impacts of COVID-19 on the senior demographic and examine how disparities in access to and competency with technology are exacerbating unfavorable outcomes in this group. This presentation will conclude by proposing pragmatic recommendations for addressing the digital gap in the future.

2. The Impact of COVID-19 on the Elderly Demographic

While the whole ramifications of this epidemic remain uncertain, its detrimental impacts on psychological well-being have been more apparent. Preliminary studies have shown a rise in anxiety and sadness among the general populace, particularly among those enduring prolonged lockdowns (38, 39). The senior population has exacerbated impacts mostly owing to more stringent lockdowns, increased disease risk, and less social support (40). Previous research indicates that, even in non-crisis periods, the elderly exhibit elevated levels of depressive symptoms (41, 42), which is concerning given that individuals with pre-existing mental health conditions have been disproportionately impacted by the adverse psychological effects of lockdowns (7). The rise in mental health issues throughout the general population is alarming, particularly when it extends beyond the psychological well-being of the elderly. Research indicates that depression in the elderly is associated with eventual cognitive impairment and an increased risk of Alzheimer's Disease (43, 44). This indicates that while several cultures now confront the urgent challenge of escalating mental health issues, the prolonged repercussions may be catastrophic, since depression and stress lead to accelerated cognitive deterioration in the elderly and heightened prevalence of Alzheimer's Disease. This issue will certainly be exacerbated by the physical restrictions imposed on persons' mobility outside their residences, leading to diminished exercise possibilities for many. Numerous studies indicate that exercise, even at mild to moderate levels, might significantly enhance cognitive performance in the elderly, particularly among individuals with cognitive deficits or neuropsychiatric illnesses (45–49). Prior study indicates that diminished sociability, heightened mental strain, prevalent mental health issues, and less physical activity may significantly adversely affect the aging population. Despite the transitory nature of the lockdowns, their consequences are expected to be enduring and may provide considerable threats to the quality of life for the senior population in the next years.

Nonetheless, the alterations seen by several nations since the onset of the COVID-19 epidemic include considerably more than diminished social interaction and heightened sadness. Lockdowns have precipitated a substantial transformation in daily life: the world has transitioned to a digital paradigm. As hospitals have been inundated with COVID-19 patients, access to routine treatment for non-COVID-related conditions has been disrupted. Individuals who neglect to pursue treatment for non-COVID-related ailments may have an elevated risk of morbidity and mortality during this time (51). This danger is expected to disproportionately impact the elderly, who exhibit a greater prevalence of health issues compared to younger demographics and are more often advised to evade locations where they can acquire the illness. In response to this issue, there has been a substantial transition in healthcare towards the digital realm. Telehealth, the provision of healthcare via digital and distant means, has grown prevalent in several nations (28, 30-34). This transition has had less beneficial outcomes for the elderly compared to other demographics. Recent research indicated that over 40% of older adults were ill-equipped to use telehealth services, mostly owing to insufficient abilities to successfully engage with the technology (52). During the pandemic, it has been further shown that the demographic with the largest telemedicine adoption comprises those aged 20–44, despite the older population typically having the highest annual frequency of doctor and hospital visits (53, 54). Recent initiatives to establish virtual geriatric clinics to assist the elderly during the pandemic have shown inconsistent performance and encountered several challenges associated with technology use (55). Consequently, while the older population is the demographic most in need of telehealth solutions, they have derived the least benefit from their deployment.

This transition into the digital domain is beyond only the healthcare industry. Online access to COVID-19-related news, educational resources, supermarket delivery services, group sociability, and several other services has become ubiquitous. The globe has adjusted to compensate for the loss of access to daily resources, proving beneficial in several regions and for many individuals (56–59). Nevertheless, one demographic that is expected to get little advantage from these digital alternatives is the senior population, which exhibits much lower rates of internet use and acceptability compared to other age cohorts (60, 61). This creates a concerning paradox: the demographic most adversely impacted by the COVID-19 epidemic is also the least likely to utilize the resources established to alleviate the consequences. This contradiction may mostly be ascribed to the inadequate computer literacy skills prevalent among the older population in contrast to younger demographics, usually referred to as the digital gap (62).

3. The Disparity in Digital Access

The digital divide refers to the disparity in access to modern technologies among certain demographic groups. Initial studies on this subject mostly focused on the disparities in technology accessibility among impoverished areas or nations (63–65) and the expanding gender-based digital gap (66–68). Nevertheless, as technology has progressed and become more integrated into our everyday existence, the issue of the digital divide has become more intricate. An article by (62) proposed a paradigm delineating four distinct degrees of technology access influenced by the digital divide. The tiers included Motivational Access, Material Access, Skills Access, and Usage Access. This delineates a significant distinction between a digital divide rooted in disparate material access to technology, a digital divide stemming from varying motivations to utilize technology, and a digital divide arising from the unequal distribution of technological skills and the capacity to employ technology effectively.

In contemporary Western nations, internet connectivity and technology utilization are quite prevalent. In European nations, around 82.5% of the population uses the internet, and 86.5% of homes have internet connection (69). Nonetheless, these figures do not reflect a particular dimension of the digital divide: that which pertains to the senior demographic in Western nations. Statistics analyzing internet use and access get limited data from older participants owing to practical constraints and often impose an upper age restriction on their sample (35). This yields data that reflects technology access and use among the broader adult population, although it neglects to address the substantial disparity in access among the elderly. Research investigating disparities in technology access and use among the elderly has shown that age is a strong predictor of both reduced access to technology and, among users, less frequent and diverse usage. This leads to a concerning conclusion: the senior population in Western nations not only has less access to technology compared to younger individuals, but even those with access possess worse digital abilities and use the technology they do have in a more restricted manner. This conclusion reflects findings from research on digital literacy indicating that the elderly often exhibit less proficiency in the adept use of technology in their everyday activities (70, 71).

Consequently, several factors contribute to the presence of the so-called gray gap among senior populations. While basic access to technology may pose challenges for certain demographics, particularly in economically disadvantaged communities, internet access rates are generally elevated, particularly in Western nations. Research indicates that cost and technological accessibility contribute minimally to the underutilization of technology among older adults (35). Research indicates that the primary factors contributing to this disparity are insufficient motivational access and a widespread skills deficiency (35). A recent study indicated that elderly individuals who expressed a dislike for technology primarily cited its inconvenience and the perception that its costs surpassed its benefits. Consequently, addressing the digital divide necessitates not only enhancing elderly access to technology and providing skills training to foster digital proficiency but also instituting programs aimed at augmenting the elderly population's motivation to utilize technology and comprehend its potential advantages. In the absence of motivational access, community-based treatments may be particularly advantageous, since they provide extensive engagement with the elderly, aiming to foster motivation transfer throughout the community as more folks embrace technology use.

The issue of the digital gap among the elderly is longstanding and has garnered heightened attention as technology increasingly permeates daily life. Nevertheless, while several research and initiatives have sought to investigate potential solutions, little progress has been achieved on a broad basis (73–75). Numerous studies about technology use among the elderly emphasize the design of technology and software that is more accessible to this demographic, leading to various recommendations for hardware and software tailored to the requirements of senior users (76–78). This study indicates that the elderly are more prone to own obsolete technology compared to younger individuals and would benefit from the development of intuitive user interfaces and affordable technological alternatives (79, 80). This crucial stage will establish the foundation for technology use among the elderly; hence, the subsequent emphasis should be on community-wide initiatives to enhance digital access, motivation, and abilities. The COVID-19 pandemic has significantly affected the worldwide society, and the long-term repercussions are expected to last for years. The epidemic has altered people's technology use and underscored the need to bridge the digital gap for the elderly, aiming to mitigate the adverse impacts of this catastrophe on a significantly impacted demographic.

4. Alleviating the Consequences of the Digital Divide

The digital gap among the elderly is not a novel issue; nonetheless, the COVID-19 epidemic has underscored the need for prompt intervention to rectify it. In the immediate term, it is essential to guarantee that digital solutions addressing lockdown issues are accessible to older demographics. In 2015, around 8.5% of the global population was aged 65 or older, and this figure is increasing year (81). This is a significant population, and during the COVID-19 epidemic, society must recognize the issues they encounter and implement actions to alleviate them. Promoting the use of digital solutions among aged populations is essential, and governments and care facilities must implement strategies to ensure that seniors are informed about the internet resources accessible during this epidemic. Enhancing knowledge of accessible resources and providing them to older adults with less technical proficiency might provide significant advantages. Virtual social activities designed for elderly adults would facilitate social interaction while eliminating the potential of COVID-19 transmission. The use of online exercise programs tailored for homebound elderly adults may provide straightforward training regimens to mitigate the physical hazards associated with less physical activity. Although short-term solutions may not effectively reach all elderly folks, particularly those with limited access to technology, they might enhance the use of digital tools for older adults who are unaware of their existence.

The immediate objectives of addressing the digital gap should prioritize mitigating the adverse impacts of the COVID-19 pandemic, while the long-term objectives should aim to effectively bridge the digital divide between older and younger demographics. Governments should implement initiatives that provide access to technology and provide older folks with the chance to acquire digital literacy skills. Care homes and community centers have to use the chance to establish digital literacy programs for senior citizens. These initiatives must consider the disparities in the causes of the digital divide that occur across different socio-economic and gender categories. Older adults in economically disadvantaged neighborhoods may have significant challenges due to limited access to technology; thus, an initial emphasis on facilitating the acquisition and maintenance of electronic resources for senior populations may be necessary in these areas. In affluent regions, the issue is more frequently attributed to a deficiency in the desire to use technology and a lack of digital competencies. Consequently, activities directed at such groups will likely need the initiation of programs focused on enhancing incentives for technology use and providing digital skills training. Variations in educational attainment and literacy rates among the general populace must be considered to facilitate the implementation of appropriate initiatives addressing the fundamental causes of the digital divide.

Previous research indicates that digital literacy initiatives for seniors may be very successful and provide enduring improvements in their digital competencies (74). Moreover, it has been shown that programs and apps tailored for the elderly may lead to a substantial enhancement in their confidence and engagement with technology (82). Many of these programs included digital skills training, which subsequently led to enhanced self-efficacy and willingness to persist in using technology. While research

on the creation and execution of digital literacy training programs for the elderly is abundant, there is a deficiency in the drive to execute these programs on a big scale. Research indicates that perceived ease of use and perceived utility are significant factors influencing technology adoption among older adults (82). Both problems may be addressed by educational campaigns and community-based initiatives to assist the elderly in comprehending how technology might enhance their daily life. Enhancing affordable access to technology, encouraging use, and advancing general digital competencies must together constitute a comprehensive effort to mitigate the disparity in technology usage. In light of the evident detrimental impacts of the digital divide and the anticipated escalation in dependence on the internet and technology, it is both overdue and imperative to initiate measures that will facilitate the bridging of this divide.

5. Summary

As the COVID-19 epidemic has advanced, unanticipated side effects have begun to emerge. As global lockdowns alter the daily lives of billions, the globe has had to adjust to these transformations. The transition to digital technologies has effectively alleviated several challenges encountered during the epidemic, enabling people to persist in socializing, studying, working, and accessing healthcare via these platforms. Nevertheless, the senior demographic, which has traditionally seen significant disparities in technology availability and use, has not experienced the same advantages as several younger cohorts. The senior group has seen some of the most severe consequences of the pandemic, characterized by stringent lockdown measures and heightened risks of mental and physical health issues, exacerbated by the digital gap that has prevented mitigation of these impacts. Immediate and sustained effort is essential to mitigate the adverse impacts of the digital gap during this epidemic and to address the disparity in the long run. Government initiatives to enhance technological access and establish digital literacy programs for aging people are essential, particularly as we go toward a more digital future. Although current measures may not entirely protect the elderly from the adverse impacts of the epidemic, they might mitigate these consequences and guarantee that this problem receives the necessary attention and resources to ultimately bridge the age-based digital gap.

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أثر COVID-19 على السكان المسنين: دراسة حول الفجوات الرقمية ونتائج الصحة في نظم الصحة العالمية

الملخص

الخلفية :أثرت جائحة COVID-19 بشكل عميق على نظم الصحة العالمية، خاصة على السكان المسنين. لقد زادت التدابير الوقائية الواسعة، رغم ضرورتها، من تفاقم الفوارق الصحية القائمة وطرحت تحديات جديدة لكبار السن، الذين هم في خطر متزايد من النتائج الشديدة المرتبطة بالفيروس.

الطرق :تستعرض هذه المراجعة الأبحاث الحالية حول الآثار النفسية والبدنية للجائحة على كبار السن. كما تفحص تداعيات تدابير الإغلاق، بما في ذلك زيادة مشكلات الصحة العقلية مثل القلق والاكتئاب، والحواجز التي تعيق الوصول إلى خدمات الرعاية الصحية. تبرز التحليل الفجوة في الوصول الرقمي والكفاءة بين كبار السن، مما أعاق قدرتهم على استخدام خدمات الرعاية الصحية عن بُعد وغيرها من الموارد الرقمية.

النتائج :تشير النتائج الأولية إلى أن حوالي 80% من وفيات COVID-19 تحدث بين الأفراد الذين تتراوح أعمارهم بين 65 عامًا وأكثر، مما يبرز الحاجة إلى تدخلات مستهدفة. لقد خلق الانتقال إلى المنصات الرقمية للرعاية الصحية والتفاعل الاجتماعي مفارقة؛ فعلى الرغم من أن هذه التقنيات قد خففت من بعض الآثار السلبية للعزلة، إلا أن كبار السن يواجهون حواجز كبيرة في الوصول والاستخدام، مما يفاقم الفجوة الرقمية.

الخاتمة :هناك حاجة إلى جهود فورية ومستدامة لمعالجة الفجوة الرقمية بين السكان المسنين. يجب أن تركز الاستراتيجيات على تعزيز محو الأمية الرقمية، وزيادة الوصول إلى التكنولوجيا، وتعزيز موارد الصحة العقلية المخصصة لكبار السن. إن سد هذه الفجوة أمر ضروري ليس فقط لتحسين نتائج الصحة خلال الجائحة ولكن أيضًا لضمان الرفاهية على المدى الطويل للأفراد المسنين في عالم يتجه نحو الرقمية بشكل متزايد.

الكلمات المفتاحية :السكان المسنون، COVID-19، الفجوة الرقمية، الصحة العقلية، الرعاية الصحية عن بُعد.