Review Paper

An Integrative Review of the Psychosocial Impacts of COVID-19 on Frail Older Adults: Lessons to Be Learned in Pandemics

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ABSTRACT

Background: The COVID-19 pandemic has inflicted tremendous pressure on people, including older adults. Frail older adults are more susceptible to the adverse consequences of the pandemic. Although many studies have investigated the susceptibility and poor medical outcomes of COVID-19 in frail people, a few studies have explored the psychosocial effects of the pandemic on this group of vulnerable people. This study overviews the psychosocial consequences of the pandemic and necessary public interventions for frail older adults.

Materials and Methods: An integrative review method was utilized to gather, analyze, and structure the study data. PubMed, Web of Science, and Scopus databases were searched to extract the published English papers based on a designed strategy. The keywords and used Boolean operators in their titles or abstracts were (["COVID-19" OR "CORONA" OR "SARS-CoV-2"] AND ["frail" OR "frailty"]). A total of 50 articles (47 quantitative, 2 qualitative, and 1 mixed method) were selected for the final analysis.

Results: Anxiety and depression were reported as the most significant psychological consequences in the related studies. The results also indicated the social relations of older frail people and their access to health services noticeably reduced during the pandemic. On the other hand, physical exercise programs, telemedicine, and reading activities were the most preventive measures to mitigate the impacts of public restrictions during the pandemic.

Conclusion: The results of this review can assist policymakers in reflecting appropriate psychosocial support for frail seniors during the pandemic. As most studies on the psychosocial aspects of the COVID-19 pandemic among frail older adults are quantitative and have been performed in developed countries, it is suggested to conduct further qualitative studies. These studies should explore frail older adults' experiences and perceptions and their challenges during the pandemic, particularly in developing countries.

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Introduction

The COVID-19 pandemic has brought numerous negative consequences for older adults. The disease has caused additional complications, morbidity, and mortality, particularly in those older adults with underlying diseases [1]. Besides the medical impacts of pathogens, COVID-19 has devastating psychological and social impacts on the general health of older adults [2]. During the pandemic, older adults exhibit higher levels of anxiety, depression, interpersonal conflicts, and social isolation but lower levels of well-being [3-6]. Evidence suggests that more than 75% of deaths caused by COVID-19 occurred in the age group of 65 years old and over [7]. In addition, higher mortality rates have been reported in frail people [8]. Therefore, it has been recommended to take preventive interventions and more targeted approaches to prioritize older adults with comorbidities [9].

Frailty is one of the predisposing factors in older adults, which can increase the prevalence of diseases and incidents among them. As per Xue's (2011) definition, frailty is "a clinically recognizable state of increased vulnerability resulting from aging-associated decline in reserve and functions across multiple physiologic systems such that the ability to cope with everyday or acute stressors is comprised" [10]. The prevalence of infectious diseases is also remarkably high among frail people [11]. Their access to health services might be difficult due to physical or mental limitations [12]. Hence, it is important to pay special attention to the health of this group during a pandemic crisis such as COVID-19.

Despite the debates, vaccination has been accepted as one of the world's most preventive measures against COVID-19 [13]. According to a World Health Organization (WHO) report, 13156047747 vaccine doses were administered worldwide until January 25, 2023 [14]. Older adults have been prioritized for receiving the COVID-19 vaccine in many countries, and the vaccination acceptance rate has increased among them [15]. However, two important issues should be considered when vaccinating older adults with frailty. First, many elders are homebound and cannot depart to the health centers for vaccination. Furthermore, there are not enough in-home vaccination services for them in many parts of the world, and many are not even identified [16, 17]. Second, there is no consensus on the vaccine's effectiveness among this group of older adults [18]. Hussein et al. believed that a weaker immune system in frail older adults causes a poor response to COVID-19 vaccination [19], and Norway reported 23 deaths in frail older adults after vaccination [20]. However, WHO recognized that the vaccine did not result in an unexpected increase in fatalities or any unusual adverse events in most frail older adults [21].

Both frailty and COVID-19 can vastly influence older adults' biological, psychological, and social aspects [22-24]. Although many studies have considered diagnoses and treatment issues in this group of older adults (e.g. higher mortality rates in COVID-19), the available psychosocial data are mostly outspread, different, or contradictory. Therefore, a comprehensive review is required to collect, integrate, and compare these results to classify our current knowledge. This study aims to review and classify published studies on the psychosocial impact of COVID-19 in frail older adults and identify the knowledge gap with a holistic approach.

Materials and Methods

In the current study, an integrative review method has been applied to explore, summarize, and integrate literature to provide a more comprehensive understanding of the psychosocial aspects of frail older adult's life during the COVID-19 pandemic. This method allows researchers to collect, classify, evaluate, and analyze quantitative and qualitative papers, detect the knowledge gaps in the literature, link different subject areas, and present new questions or concepts [25]. The study passes five stages.

1) Problem identification, 2) Literature search, 3) Data evaluation, 4) Data analysis, 5) Interpretation and presentation of results (discussion and conclusion) [26].

Literature search and data collection

Data collection was conducted between May and August 2022. The inclusion criteria comprised all qualitative and quantitative published papers in the PubMed, Web of Science, and Scopus databases with the search strategy shown in Table 1.

Data evaluation

Following the study objectives, we used the subsequent criteria to evaluate papers and extract the irrelevant papers: A) Studies without having a specific sample group of frail older adults (60 years and over) or without presenting a particular result for them, B) studies on institutionalized individuals and inpatients, C) studies on medical issues such as diagnosis, assessments, treatments, outcomes, prognosis, and mortality rates, D) Case reports, editorials, commentaries, and other papers without specifying a certain method, and E) Papers without available full text, such as poster presentations.

Table 1. Search strategy for paper selection

Database	Strategy Search
PubMed	(((frailty [Title/Abstract]) OR (frail [Title/Abstract])) OR (elderly, frail [MeSH Terms])) AND ((((COVID-19[Title/Abstract]) OR (corona [Title/Abstract])) OR (SARS-CoV-2[Title/Abstract])) OR (coronavirus, sars [MeSH Terms]))
Scopus	(TITLE-ABS-KEY (COVID-19 OR corona OR SARS-CoV-2) AND TITLE-ABS-KEY (frail OR frailty))
Web of Science	(TS=(COVID-19 OR corona OR SARS-CoV-2)) AND TS=(frail OR frailty)

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As shown in Figure 1, we initially found 3577 articles, which were reduced to 2066 after removing the duplicates. When the irrelevant titles were removed, this number dropped to 353. We examined the abstracts and omitted those papers that did not meet inclusion criteria or those with corresponding exclusion criteria. Subsequently, 112 papers with full text remained. After review, 50 articles were selected (published between November 2020 and August 2022) for the final analysis (Figure 1).

Distribution and connections between the keywords of the final papers were illustrated by a VOSviewer software, version 1.6.16.

3. Results

In this study, we categorized the main findings from 50 studies to make them comparable and understandable. Figure 2 displays the distribution and connections between the keywords of the selected papers for final analysis.

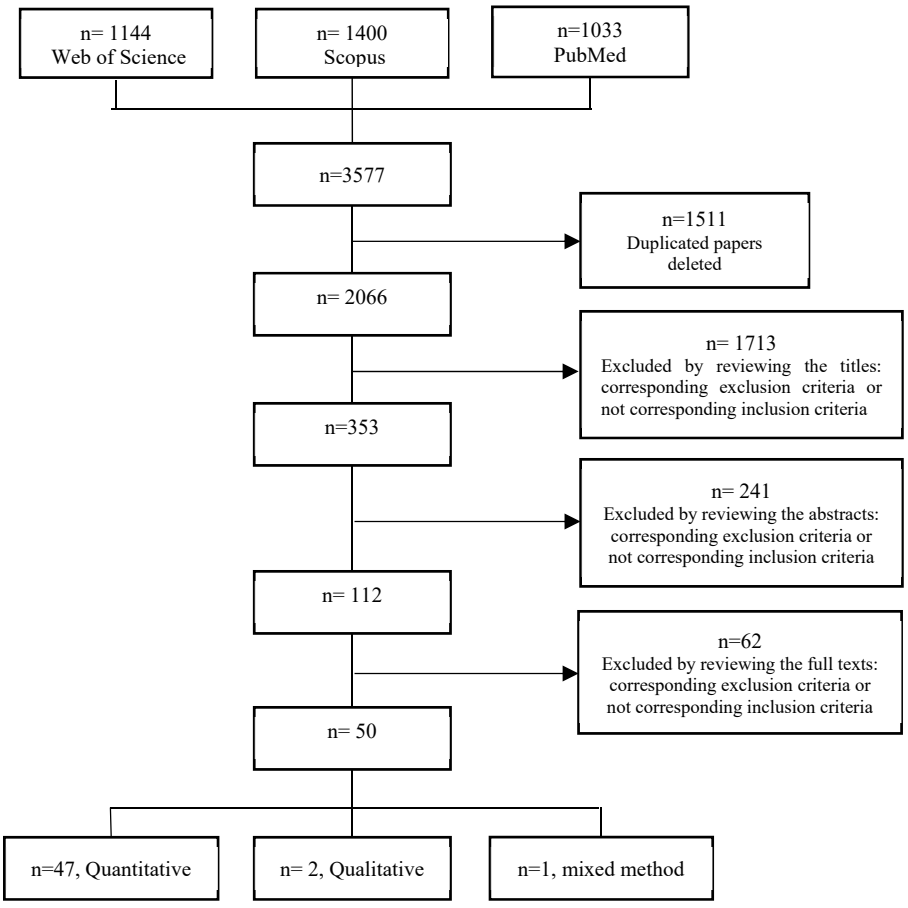

Figure 1. Paper selection flowchart

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As shown in Table 2, most studies were qualitative and were conducted in developed countries. The highest number of studies belonged to Japan (n=13, 26%), Italy (n=5, 10%), Canada, Spain, the UK, the US, and Spain (n=4 each, 8%), and China (n=3, 6%). The main findings of the reviewed papers have been clustered into three categories: Social consequences, psychological impacts, and preventive measures (Table 3).

Social consequences

Much evidence in the current review indicates that the raised prevalence of frailty and the incidence of transition to a frailty state during the COVID-19 pandemic can be due to the implementation of constraints during the crisis [41, 42, 50, 54, 60, 62, 72, 74]. It has been reported that frail seniors' social activities and interaction with friends and family declined during the pandemic [52]. On the other hand, a lack of social activities was associated with a higher risk of frailty [40, 58]. Older people living alone demonstrated more decline in their physical activities and frailty [30, 36]. Higher levels of frailty and disability have also been reported after COVID-19 hospital discharge [66], and frail survivors require more care [29, 32]. Moreover, the results of some studies indicated that access to medical and social services declined during the pandemic [34, 49, 51, 68], worsening frailty status [35, 37, 43]. These conditions influenced frail seniors' well-being and quality of life [53, 60].

Psychological impacts

The analysis of the extracted papers indicated that the general mental health of frail older adults deteriorated during the COVID-19 pandemic [39, 46, 48, 49, 67]. Depressive mode and anxiety are two major psychological effects of the pandemic on frail seniors [33, 48, 54, 55, 62, 63]. Depressive mood was associated with lower physical activity and a correlation between cognition and physical decline in frail older adults with hypertension during the pandemic [30, 64]. On the other hand, cognitive deterioration was also reported during the pandemic [48, 70]. Frail older adults reported fewer coping behaviors for health maintenance compared with their robust counterparts, and the restrictiveness of lockdown negatively affected their well-being [51, 53, 60].

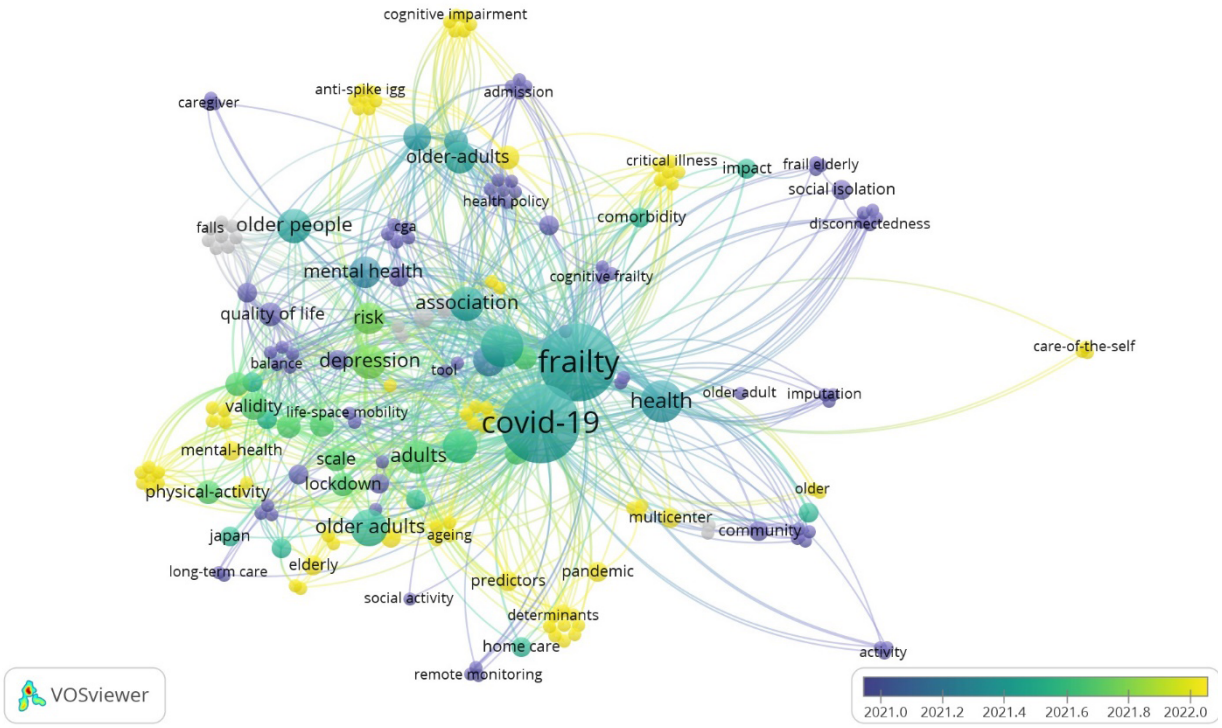

Figure 2. Year, distribution, and connections between the keywords of the papers

They were extracted by VOSviewer software version 1.6.16 (195 keywords, minimum threshold for illustrating items=1).

Table 2. The extracted papers for the final analysis

Author/s	Month	Country	Main Objective	Study	Sample
Pandolfini et al. 2020 [27]	October	Italy	To assess the association of frailty with factors of social exclusion	Cross-sectional analysis	1354 older residents, 598 men 756 women
Saraiva et al. 2020 [28]	November	Brazil	To investigate the relationship between life-space mobility and quality of life (QoL)	Cross-sectional	557, 360 women (65%)
Vilches-Moraga et al. 2020 [29]	December	UK	To determine whether pre-admission frailty is associated with increased care needs at discharge	Multicenter observational study	831 patients, 369 women (44.4%)
Pérez et al. 2021 [30]	January	Spain	To assess the effect of the lockdown on PA levels	Before and after the study	98 frail older adults, 66.3% women
Satake et al. 2021 [31]	January	Japan	To study the participation of older users of information and communicative technology (ICT) in active behaviors	Cross-sectional	2304 (51.3% men), frail participants 582 (25.3% men)
Welch et al. 2021 [32]	February	UK	To evaluate the association of age, frailty, and delirium in COVID-19 patients with adverse outcomes such as transitions of care needs	Multicenter cohort	n=5711, 2562 women (44.9%)
Chen et al. 2021 [33]	February	US	To address the impact of the pandemic on the lives of older people with frailty	Inductive qualitative analysis	3 men (30%) 7 women (70%)
Liu et al. 2021 [34]	February	Canada	To describe factors associated with receiving different virtual care modalities	Cross-sectional study	330 patients, 105men (46.3%) in group 1 44 women (42.7%) group 2
Hirose et al. 2021 [35]	April	Japan	To study characteristics of patients who discontinued outpatient rehabilitation services and the effect on patient frailty	Prospective observational study	119 older adults, 69 men, 50 women
Yamada et al. 2021 [36]	April	Japan	To investigate the influence of the COVID-19 pandemic on physical activity (PA) and the incidence of frailty	Longitudinal	937 subjects, 458 women (48.9%)
Schuster et al. 2021 [37]	May	The Netherlands	To report cancellation or avoidance of medical care during the 1st months of the COVID-19 pandemic	Cross-sectional	880 older adults, 50.3% women
Murukesu et al. 2021 [38]	March	Malaysia	To compare physical activity patterns, psychological well-being, and coping strategies of older persons with cognitive frailty in the "WE-RISE" trial	Randomized controlled trial	42 older adults Women 37
Wang et al. 2021 [39]	March	China	To investigate changes in psychological distress in community-dwelling older adults before and during the COVID-19 pandemic and the contribution of frailty.	Prospective repeated-measures cohort	2785 respondents, 1770 women (55%)
Morina et al. 2021 [40]	March	N/A	To study the association of physical and mental health with social connection	A rapid narrative umbrella review	25 meta-analyses
Mete et al. 2021 [41]	March	Turkey	To evaluate the impact of the pandemic on the fragility of older adults	A cross-sectional study	156 men (48.9%) 163 Women (51.1%)
Shinohara et al. 2021 [42]	June	Japan	To clarify the actual frail status over 6 months with the COVID-19 countermeasures	Prospective cohort	459 women (77.4%) 134 men (22.6%)
Kawamura et al. 2021 [43]	June	Japan	To assess the impact of the pandemic on the activity levels of frail older adults	Longitudinal study	175 participants Women 92 (53%)
Weeks et al. 2021 [44]	July	Canada	To identify the health service experiences and preferences of frail home care clients and their family and friend caregivers during the COVID-19 pandemic	Qualitative	10 home care clients and 19 caregivers

Author/s	Month	Country	Main Objective	Study	Sample
Chen X et al. 2021 [45]	July	China	To evaluate the impact of the Otago Exercise Programmer (OEP) on physical function and mental health among elderly with cognitive frailty during the COVID-19 pandemic.	Randomized controlled trial	62 elderly people with cognitive frailty, women (control group 60% vs OEP group 82.8%)
Cerami et al. 2021 [46]	August	Italy	To assess frailty and social vulnerability during the 1st lockdown phase	Cross-sectional	Men 359 (28.5%), 899 women (71.5%)
Kitamura et al. 2021 [47]	September	Japan	To grasp the management situation of "Kayoinoba" during the pandemic	Observational	101 respondents, 84.2% women
Pizano-Escalante et al. 2021 [48]	October	N/A	To describe frailty as a physiological vulnerability agent during the COVID-19 pandemic	Review	Baseline search 612 documents
Bailey et al. 2021 [49]	November	Ireland	To examine health trajectories and healthcare utilization while cocooning	Cross-sectional	150 individuals, 55% women
Okamura, 2021 [50]	November	Japan	To identify depressed mood and frailty and its related factors in older people during the pandemic.	Longitudinal	1736 residents
Kera et al. 2021 [51]	November	Japan	To determine the impact of the pandemic on the subjective health status of frail older adults	Longitudinal-study	720 Individuals women=454 (Initial screening 2019)
Aktia et al. 2021 [52]	December	Japan	To investigate the relationship between social activities and frailty during the restriction on outings due to COVID-19.	Cross-sectional	213 women aged 65 years or older
Garner et al. 2022 [53]	January	England and Spain	To assess potential changes in frailty and mental well-being across 7 months through lockdown	Longitudinal cohort study	70 participants 41 women
Kodama et al. 2022 [54]	January	Japan	To clarify the impact of social frailty in community-dwelling older adults to identify factors that can predict transition to social frailty in the pandemic	Longitudinal	103 participants 21 women
Hayashi et al. 2022 [55]	February	Japan	To study the association between social frailty and depressive symptoms and to investigate whether home exercise habits moderated the impact of social frailty on depressive symptoms.	Cross-sectional	1,103 individuals, 54.0% women
Gao et al. 2022 [56]	February	Singapore	To synthesize available evidence on the effectiveness and safety of COVID-19 vaccines for frail older adults	Rapid review and Delphi panel (mixed method)	10 final papers, 16 consensus state-ments
Vinh et al. 2022 [57]	February	Canada	To assess the antigenicity of mRNA-based COVID-19 vaccines in frail, older people	Prospective observational cohort	78 individuals, 60 women (77%)
Ozone et al. 2022 [58]	March	Japan	To examine the frailty status of older individuals in Japan 1 year after the onset of the pandemic	Cross-sectional	1047 individuals, 520 women (49.7%)
Gomes et al. 2022 [59]	March	Portugal	To assess interventional teleconsultation for frail adults	Action-research methodology.	5 nurses of the health care center and 3 frail older people
Sealy et al. 2022 [60]	March	The Neth-erlands	To assess the prevalence and characteristics of frailty, to examine differences in perceived COVID-19-related concerns and threats between frail and non-frail people, and to identify variables associated with frailty in the 1st wave of the COVID-19 pandemic	Cross-sectional analysis of data collected from a cohort study	5265 men (47%), 5880 women (53%)

Author/s	Month	Country	Main Objective	Study	Sample
Okyar Baş et al. 2022 [61]	May	Turkey	To assess antibody response after vaccination with SARS-CoV-2 in older adults	Cross-sectional Study	497 participants, 305 women (61.4%)
Bricio-Barrios et al. 2022 [62]	May	Mexico	To study the impact of the pandemic on the nutritional and functional status of older adults	Longitudinal study	71 individuals women 80.3% (n=57)
Braude et al. 2022 [63]	May	UK	To examine the effect of living with frailty on mental health one year after hospital with COVID-19	Multicenter cross-sectional	224 participants, 34.8% women
Mone et al. 2022 [64]	May	Italy	To investigate the correlation between physical and cognitive impairment in older adults with frailty and hypertension	Longitudinal	203 participants, 118 women (58.5%)
Watanabe et al. 2022 [65]	May	Japan	To determine the feasibility of a three-month home-based exercise program to prevent the progression of frailty during COVID-19	Feasibility and interventional study	n=63 women pre-frail and frail (n=38) robust (n=25)
Taniguchi et al. 2022 [66]	June	Brazil	To investigate frailty and disability transitions in COVID-19 patients after discharging	Prospective cohort	428 participants with a mean age of 64 years, 57% men admitted by ICU
Castellano-Tejedore et al. 2022 [67]	June	Spain	To identify correlates of the lockdown's psychological distress in frail older community-dwellers	Cross-sectional	94 participants, 68,1% women
Subramaniam et al. 2022 [68]	June	Australia	To clarify the actual frail status over 6 months with the COVID-19 countermeasures	Retrospective cohort	2019 (n=2021) 958 men (47.4%) 2020 (n=1849) 912 men (49.3%)
Seligman et al. 2022 [69]	June	US	To assess frailty and protection against hospitalization in COVID-19-positive older veterans	Cohort study	1091 veterans 1026 men (94%)
Sardella et al. 2022 [70]	June	Italy	To investigate the consequences of the pandemic on cognitive performances, functional status, and health-related quality of life among frail outpatients	Longitudinal study	71 outpatients, 70% women
Li et al. 2022 [71]	July	China	To examine the dose-response relationship between physical activity, sitting time, and frailty in the context of COVID-19 pandemic	Cross-sectional study	Total 1458, 873 women (59.88%)
McArthur et al. 2022 [72]	July	Canada	To determine factors associated with distressing social decline and withdrawal during the COVID-19 pandemic for home care recipients.	Longitudinal study	Total sample before pandemic=26,492 Women 16,497 (62.3%) pandemic sample 19126, 11851 women (62.0%)
Semelka et al. 2022 [73]	July	US	To examine frail adults' COVID-19 mRNA vaccine antibody response compared to non-frail older adults.	Observational study	Total 16771, 964 women (57%)
Pilotto et al. 2022 [74]	July	Italy	To explore the clinical course of frailty condition during COVID-19pandemic	A prestige project	217 community-dwelling older adults, 108 women (49.8%)
Tang et al. 2022 [75]	September	US	To compare COVID-19 vaccine effectiveness against hospitalization and death according to frailty status	Retrospective cohort study	57 784 veterans, 50 642 men (87.6%)
Markotegi et al. 2022 [76]	August	Spain	To analyze changes in the physical and mental health of older adults in a multicomponent physical exercise (MPE)	Quasi-experimental trial	17 participants, 15 women (88.2%)

Table 3. Categorization of data

Main Category	Subcategory	Extracted Data
Social consequences	Incidence	There was an increase in the transition rate of elderly individuals to the social frailty group, which can result from implementing the stay-at-home order [54]. The frailty prevalence increased from 10% to 16% between spring 2018 to spring 2020 [50]. The prevalence of frailty is significantly higher during the 1st wave of COVID-19 compared to the results of an earlier study approximately 10 years before the pandemic [60]. The prevalence of frailty among community-dwelling older adults increased during the pandemic [42]. Older adults living alone and socially inactive during the pandemic showed a significantly higher risk of incident frailty [36]. A significant reduction in the frailty scale of older adults was reported in a longitudinal study from 2018 to 2021 [62]. The pandemic was associated with greater odds of frailty (OR=3.21) [72]. The population of pre-frail and frail older adults increased by 4.7% and 6.6%, respectively, in the 1st 6-month period of the pandemic [41], independent of SARS-CoV2 infection, frail older adults had a significantly higher risk of worsening frailty condition [74].
	Care needs	Higher levels of frailty and disability after COVID-19 hospital discharge were reported [66]. An increased care need in the survivors of COVID-19 with frailty was reported [32]. Frailty was strongly associated with the need for a higher level of independence and an increased need for care after discharge [29].
	Social activities	Social activities decreased during the restrictions due to the COVID-19 pandemic [52]. Living alone was associated with reduced physical activity levels [30]. Lack of social participation activities during the 1st year of the COVID-19 pandemic was significantly associated with a higher risk of frailty [58]. Lack of social connection during the pandemic was associated with frailty [40].
	Social support	Devastating impacts from the COVID-19 pandemic and lack of access to medical and social services were reported [49]. The frail seniors who discontinued rehabilitation programs had more frailty-related factors than the continuing group [35]. Timely Goal of Care (GOC) documentation decreases in frail patients during the COVID-19 pandemic compared to the pre-COVID-19 era [68]. Frail older adults are more susceptible to the negative effects of refraining from outpatient or rehabilitation programs during the pandemic and require careful management [43]. Frail participants reported fewer resources of information related to COVID-19 compared with their robust counterparts [51]. Frailty was associated with lower odds of virtual health assessments in the Pandemic (OR=0.6) [34]. Respondents who postponed help-seeking had higher levels of functional limitations and frailty [37].
	Interaction with friends	A hindered interaction with friends was reported [52]—a significant association between frailty and hindered interaction with friends [52].
	Interaction with family	Hindered interaction with family was reported [52].
	Quality of life	Frail participants with restricted life-space mobility had twice the odds of a pandemic impact on their quality of life compared to their non-frail counterparts [28]. Significant association of fragility and quality of life among older frail adults during the pandemic [60]. Pre-frail and frail adults showed a significant decline in physical and mental quality of life in the follow-ups before and after the pandemic [70].

Main Category	Subcategory	Extracted Data
Psychological impacts	Anxiety	The findings indicated higher anxiety symptoms in frail people [63]. Anxiety has been reported as a consequence of the pandemic in frail older adults [48]. The negative emotional consequences, including stress, worry, and anxiety due to the pandemic conditions, were reported by frail and pre-frail participants [33].
	Depressive mood	Higher levels of depression symptoms in frail people [63] appeared to be worse during the pandemic and was associated with lower physical activity levels [30]. A significant association of social frailty with the risk of depressive symptoms during the pandemic (OR=1.80) was reported [55]. Higher levels of social frailty were associated with depressive symptoms [54]. Depression has been reposted as a consequence of the pandemic lockdown [48]
	Cognition	The pandemic has been associated with higher levels of cognition decline in frail older adults [48]. A significant correlation was found between physical and cognitive decline in frail hypertensive older seniors [64]. Pre-frail and frail adults showed significantly lower cognitive performances in the follow-ups before and after the pandemic [70].
	Mental health	Deterioration in mental health was reported by 40% of the participants while cocooning [49]. Frailty significantly correlates with the perception of the impact of COVID-19 on health [46]. A lower perception of health has been reported during the pandemic [48]. Older adults frailty reported more psychological distress during the COVID-19 pandemic [39]. High prevalence (84.9%) risk of experiencing moderate-to-high psychological distress [67].
	Well-being	The negative impact of restrictiveness of lockdown(s) on older adults' well-being and frailty [53]. Significant association of fragility and physical well-being among older frail adults in the pandemic [60].
	Coping behaviors	Frail participants reported fewer coping behaviors for health maintenance than their robust counterparts [51].
	Posttraumatic stress disorder	Post-traumatic stress disorder was significantly more common in older, frail individuals [63].
Preventive measures	Reading activities	Performing reading activities had a positive association with physical activity in frail seniors [30].
	Exercise program	Otago exercise program significantly improved physical function and mental health in frail participants [45]. Physical activity reduced the impact of the lockdown on well-being and frailty [53]. Participation in "Kayoinoba" can reduce the deterioration of mental and physical conditions [47]. WE-RISE (resilient mind and muscle exercise) could improve physical activity, functional independence, and self-perceived social-psychological prosperity [38]. The three-month home-based exercise program was associated with improving health indicators [65]. Interventions to reduce sitting time can lower the risk of frailty during the pandemic and should be seriously considered by public health authorities [71]. The frailty parameters significantly improved after starting the multicomponent physical exercise (MPE) sessions and worsened after the rest period or interruption [76].
	Social networks	Social networks had a positive association with physical activities [30].
	Vaccination	Vaccination is necessary for frail seniors because of the higher risk of complications and death due to COVID-19 [56]. mRNA vaccine influenced antibody responses when used with a 16-week interval [57]. The frail group had a lower serological response 90 days after the 2nd vaccination [61]. Vaccination prevents hospitalization of frail older adults after infection [69]. Although antibody response was high among frailty categories after vaccination, frailty was significantly associated with less antibody response to COVID-19 mRNA vaccines [73]. Frail participants showed lower levels of vaccination protection against COVID-19-associated hospitalization and all-cause death compared with non-frail counterparts [75].

Main Category	Subcategory	Extracted Data
Preventive measures	Age-friendly environment	Perceived age-friendliness of the environment mitigated the impact of lockdown on well-being and frailty [53].
	Social support	Telephone outreach could be an effective solution for older frail adults in COVID-19 because many are unfamiliar with modern communication tools like social networks [50]. Information and Communicative Technology (ICT) users are more active in maintaining health levels during social restrictions [31]. The passive remote monitoring technology was particularly useful for assisting frail older adults during the restrictions of the COVID-19 pandemic [44]. Implementing teleconsultation as a nursing intervention effectively controls frailty in older people; it can boost adherence to the therapy plan and overcome loneliness [59]. Better perceived social activation can play a key role in the pandemic to prevent the worsening of frailty [27].

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Preventive measures

In response to the COVID-19 negative psychosocial impacts on older seniors, the researchers recommended some preventive measures, including simple activities such as reading. One of the dominant non-medical intervention programs to prevent worsening frailty during the pandemic is programmed exercises [38, 45, 47, 53, 65, 76]. Social support is also reported as an important preventive measure as well. Telecommunication facilities were reported as effective tools to identify and meet the needs of frail seniors during the pandemic [31, 44, 50, 59], although some clients were more comfortable with the telephone than using the new technologies [50]. Performing reading activities and boosting social networks were associated with higher physical activity levels [30]. Perceived age-friendliness of the environment mitigated the impact of lockdown on well-being and frailty [53]. There is no consensus on the efficacy of vaccination in frail seniors. Still, as COVID-19 can instigate worse outcomes in frail people, such as more disability and longer care needs, vaccination has been recommended for these vulnerable people [56, 57, 69].

Discussion

The results of the current integrative review indicated that the COVID-19 pandemic has complex, serious adverse effects on the psychosocial aspects of the lives of frail seniors. The lockdown, restrictions, and limited access to health services caused a decline in social activities, social relations (resulting in weaker social capital), physical activities, and psychological health, resulting in an increase in the prevalence and incidence of frailty in the pandemic era. These conditions lowered their mental health, quality of life, and perceived well-being. In return, frailty aggravation in the pandemic can also negatively impact psychological health and physical activities. This vicious cycle is shown in Figure 3.

Initially, COVID-19 restrictions were implemented to protect people, but such social and physical limitations could negatively affect older adults' physical activity and mental health [77, 78]. These conditions negatively affect frail older adults and need re-organization of healthcare systems for more sufficient interventions. Additionally, long-term psychological consequences should be considered for this vulnerable group [79]. Anxiety and depression are two psychological consequences of the pandemic restrictions in older adults [80]. Perceived loneliness may also be associated with significant psychological distress due to the lockdown condition [81]. In other words, these effects were more severe among older adults living alone and interacting less with their neighbors [82].

Although social distancing and stay-at-home orders are crucial for frail older adults during pandemics, maintaining social connections with others can reduce social isolation and exclusion [83]. The health benefits of socialization and interaction with others have been highlighted for older adults. As social distancing can reduce these interactions and cognitive stimulation, the solution lies in using technologies such as social media and telephone or video calls for older frail adults, along with appropriate guidance [84].

As frailty manifests itself by physiological declines in different systems, interventions and broad-based approaches are needed to empower frail people and their caregivers during the pandemic [84]. The impacts of limited access to social and health services during the

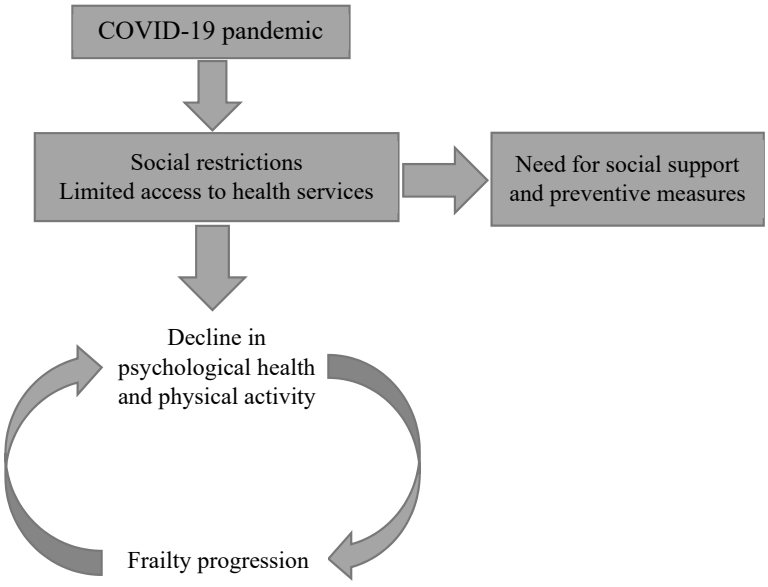

Figure 3. Impact of COVID-19 pandemic on frailty progression

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lockdown may accelerate frailty in older adults [79, 80]. Therefore, special attention should be paid to preventive measures. Some of the suggested preventative measures are simple, feasible, and do not require special equipment. For instance, exercises such as strength, balance, and walking are useful for frail older adults during the pandemic to prevent the worsening of frailty [77]. In this regard, telehealth can assist more senior people in following their exercise delivery during the pandemic, and it is potentially more effective in addressing the needs of older adults in remote areas [80]. Interventions through education and telephone follow-up can also reduce the burden of care of caregivers of older adults [85]. Nursing students were reported to have sufficient confidence in using telemedicine for frail people during the pandemic, and they confirmed its validity and importance [86].

Although public vaccination is recognized as an important preventive measure to control contagious diseases, there is still some public mistrust about the effectiveness of COVID-19 vaccination [15, 18]. Frail adults have been reported to have a weaker immune system, which is a predisposing factor for a higher risk of adverse outcomes and mortality due to COVID-19. This decline can also lead to a poor immune response to vaccination [19]. On the other hand, the results of a study by Seiffert et al. do not confirm the above assumption. They reported that increased anti-SARS-CoV-2 IgG antibody levels after mRNA COVID-19 vaccination (with BNT162b2) in long-term facilities did not correlate with frailty and age [87]. It can be assumed that there is a knowledge gap in basic research and clinical practice [88]. Filling these gaps is critical for maintaining confidence in vaccinating frail older adults against COVID-19. In this regard, surveillance and evaluation of COVID-19 vaccination are important. Accordingly, continuous consultation with geriatricians in regulatory and advisory decision-making is necessary [89].

Conclusion

As pandemics such as the COVID-19 outbreak impose great psychosocial strains on frail older adults, more supportive and preventive measures should be taken for them. The results of this review can assist policymakers in considering appropriate social support for frail seniors during pandemics. Prescribing physical and reading activities and boosting social networks can prevent worsening frailty during pandemic-related restrictions. Since most studies are quantitative and have been conducted in developed countries, further qualitative inquiries are suggested to explore the challenges of frail older people during the pandemics in developing countries.

As a limitation of the current review, it should be noted that some studies may have included subgroups of frail older participants in their sample groups without mentioning the word “frail” in their Titles or Abstracts. Even if they presented results and reports on the psychosocial problems of frail seniors, they have not been included in our literature review.

Ethical Considerations

Compliance with ethical guidelines

This review study was approved by the Ethics Committee of the University of Social Welfare and Rehabilitation Sciences (Code.: IR.USWR.REC.1400.097).

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Authors' contributions

Choosing the search strategy: Mohammad Saatchi and Arya Hamedanchi; Selection of the papers: Arya Hamedanchi and Nasibeh Zanjari; Resolution of disagreements: Yadollah Abolfathi Momtaz; Rechecking of the papers: Tahereh Ramezani; Final analysis: All authors with the supervision of Ahmad Delbari and Hamid Reza Khankeh.

Conflict of interest

The authors declared no conflict of interest.

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