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Review

Characterization of Covid-19 vaccines and outcomes in the older adults population: a scoping review

Caracterização das vacinas contra a Covid-19 e o desfecho na população idosa: revisão de escopo

Caracterización de las vacunas contra la Covid-19 y sus resultados en la población de adultos mayores: revisión del alcance

Caroline Camilo da Silva[1]
ORCID: 0009-0004-4974-5879
Ana Cristina Ribeiro La Scaléa[2]
ORCID: 0000-0002-0493-8376
Silvia Carla da Silva Andrz[2]
ORCID: 0000-0002-0236-5025

Abstract

Objective: To map, in the scientific literature, the relationship between the number of doses and manufacturers of Covid-19 vaccines administered and outcomes in the older adults population. **Methods:** Scoping review based on the six-step methodology outlined by the Joanna Briggs Institute (JBI). Nineteen primary studies published in English, Spanish, and Portuguese were included, retrieved from the PubMed, Web of Science, Scopus, and BVS databases. **Results:** Vaccination significantly reduced hospitalization and mortality rates among vaccinated older adults compared to those unvaccinated. Booster doses were assessed for their effectiveness, demonstrating increased protection and a sustained antibody response. **Conclusion:** Immunization played a crucial role in reducing hospitalizations and mortality among vaccinated older adults. Factors such as immunosenescence and comorbidities affect vaccine effectiveness, making long-term immunization with adherence to booster doses essential to ensure continued protection for this population.

Descriptors: Older Adults; Senior citizen, 80 years or older; Covid-19; Elderly; Older

[1]Universidade Federal de São Paulo. São Paulo, SP, Brasil.
[2]Universidade Federal de São Carlos. São Carlos, SP, Brasil.

Corresponding author:
Caroline Camilo da Silva
E-mail: cc.silva@unifesp.br

Whats is already known on this?
The COVID-19 pandemic severely affected older adults, showing a high rate of complications and mortality. Comorbidities and weakened immunity contributed to the elevated incidence of deaths.

What this study adds?
This original study aims to contribute to the theoretical and scientific framework regarding the importance of vaccination and the effectiveness of the vaccines developed against COVID-19.

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Resumo

Objetivo: *Mapear na literatura científica a relação entre o número de doses e fabricantes das vacinas contra a Covid-19 aplicadas e o desfecho na população idosa.* ***Métodos:*** *Revisão de escopo com base nos seis passos metodológicos do Joanna Briggs Institute (JBI). Foram incluídos 19 estudos primários publicados em inglês, espanhol e português, disponíveis nas bases de dados PubMed, Web of Science, Scopus e BVS.* ***Resultados:*** *A vacinação reduziu substancialmente as taxas de hospitalização e mortalidade entre os idosos vacinados em comparação com os não vacinados. As doses de reforço foram analisadas quanto a sua eficácia, evidenciando o aumento da proteção e a resposta duradoura de anticorpos.* ***Conclusão:*** *A imunização foi fundamental para reduzir hospitalizações e mortalidade entre os idosos vacinados. Fatores como a imunossenescência e as comorbidades influenciam na eficácia vacinal, sendo a imunização prolongada, com a adesão às doses de reforço, essencial para manter a população protegida.*

Descritores: *Idoso; Idoso, 80 anos ou mais; Covid-19; Idoso; Mais velho.*

Resumén

Objetivo: *Mapear la relación entre el número de dosis y fabricantes de vacunas Covid-19 aplicadas y el resultado en la población de ancianos en la literatura científica.* ***Método:*** *Revisión de alcance basada en los seis pasos metodológicos propuestos por el Joanna Briggs Institute (JBI). Se incluyeron diecinueve estudios primarios publicados en inglés, español y portugués, disponibles en las bases de datos PubMed, Web of Science, Scopus y BVS.* ***Resultados:*** *La vacunación redujo sustancialmente las tasas de hospitalización y mortalidad entre los ancianos vacunados en comparación con los individuos no vacunados. Las dosis de refuerzo se analizaron por su eficacia habiéndose evidenciado una mayor protección y una respuesta de anticuerpos duradera.* ***Conclusión:*** *La inmunización fue esencial para reducir las hospitalizaciones y la mortalidad entre los ancianos vacunados. Factores como la inmunosenescencia y las comorbilidades influyen en la eficacia de la vacuna, advirtiéndose que la inmunización prolongada, con adherencia a las dosis de refuerzo, es esencial para mantener a la población protegida.*

Descriptores: *Anciano; Ancianos, 80 años o más; Covid-19; Anciano; Más viejo.*

INTRODUCTION

The Covid-19 pandemic reshaped global reality, exposing human vulnerability to disease, particularly among older adults, who were among the most severely affected groups. SARS-CoV-2 spread rapidly, placing older adults and those with comorbidities at heightened risk for developing severe forms of the disease.[1]

In the absence of effective pharmacological therapy and given the difficulty in controlling viral transmission, a global race began for the development of safe and effective vaccines. In this context, Covid-19 vaccination campaigns were launched in several countries by the end of 2020. In Brazil, the National Immunization Program (*Programa Nacional de Imunização*, PNI) prioritized high-risk groups during the initial phase of vaccine rollout, including older adults across different age brackets.[2]

The prioritization of individuals aged 60 years or older was justified by their increased likelihood of developing severe Covid-19 and experiencing adverse outcomes, including death. Brazilian data show that 14.8% of individuals aged 80 or older who contracted Covid-19 died, highlighting a significant increase in lethality with advancing age.[3]

As the pandemic evolved and transitioned into an endemic scenario, the PNI incorporated bivalent booster doses into its strategy. The recommendation was to observe a four-month interval after the previous booster for priority groups, including individuals aged 60 or older. The updated vaccine also addressed genetic mutations from emerging variants, broadening coverage against circulating viral strains.[4-5]

Vaccination was considered a key strategy to control the Covid-19 pandemic and reduce hospitalizations and mortality. Immunizing the older adults population was critical, given that these individuals naturally exhibit lower immunity due to immunosenescence, in addition to having comorbid conditions that increase the risk of developing severe Covid-19.[6]

Immunosenescence reduces immune response, placing older adults at greater risk for severe Covid-19. The decline in immune system function impairs both innate and adaptive immune responses, weakening the protective and memory mechanisms activated through vaccination.[7]

This study is justified by the need to understand elderly immunization against Covid-19, considering factors such as immunosenescence and comorbidities. It is essential to assess how different vaccines and manufacturers influence protection in this population. This scoping review aims to map current evidence and identify gaps to guide future research, particularly in public health and geriatrics. The objective is to analyze the relationship between the number of doses, vaccine manufacturers, and clinical outcomes such as hospitalizations, severe cases, and mortality in older adults.

METHODS

This study is a scoping review conducted according to the six methodological steps outlined by the Joanna Briggs Institute (JBI): identification of the research question, identification of relevant studies, selection of studies, data extraction, data categorization and synthesis, and presentation of results.[8] The PCC framework was applied to construct the guiding research question, in which P stands for "Population" (Older adults), C for "Concept" (Covid-19 vaccination), and C for "Context" (Pandemic), resulting in the research question: "What is the relationship between Covid-19 vaccination and mortality reduction among older adults?"

The article search was conducted in the PubMed, Web of Science, Virtual Health Library (BVS), and Scopus databases, between December 2023 and February 2024, by a primary researcher. Discrepancies were discussed with a second researcher and resolved by consensus. The search terms used in BVS were: Covid-19; Covid-19; Vaccines; SARS-CoV-2; Older adults; Adults aged 80 and over; Eldest. In PubMed, Web of Science, and Scopus, the equivalent English terms were used: Covid-19; Covid-19; Vaccines; SARS-CoV-2; Aged; Aged, 80 and over; Elderly; Oldest old. The descriptors and their synonyms were retrieved from the Health Sciences Descriptors (DeCS) and the Medical Subject Headings (MeSH) (Table 1).

After the search strategy was completed, references were saved and exported to the StArt (State of the Art through Systematic Review) web application for two-level article selection. The first stage involved title and abstract screening, followed by full-text reading. The StArt platform was developed by the Software Engineering Research Laboratory (LaPES) at UFSCar. The PRISMA-ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for scoping reviews) was used for data extraction.[9-10] This study did not require approval from a Research Ethics Committee, as it involved a scoping review.

Chart 1. Search strategies used in the databases. São Paulo, SP, 2024.

DATABASE	*SEARCH STRATEGY*
PubMed, Web of Science and Scopus	"(Covid-19 OR Covid-19) AND (Vaccines) AND (SARS-CoV-2) AND (Aged OR Aged, 80 and over) AND (Oldest Old)"
Virtual Health Library *(Biblioteca Virtual em Saúde, BVS)*	"(Covid-19 OR Covid-19) AND (*Vacinas*) AND (SARS-CoV-2) AND (*Idoso* OR *Idoso, 80 anos ou mais*) AND (*Mais Velho*)"

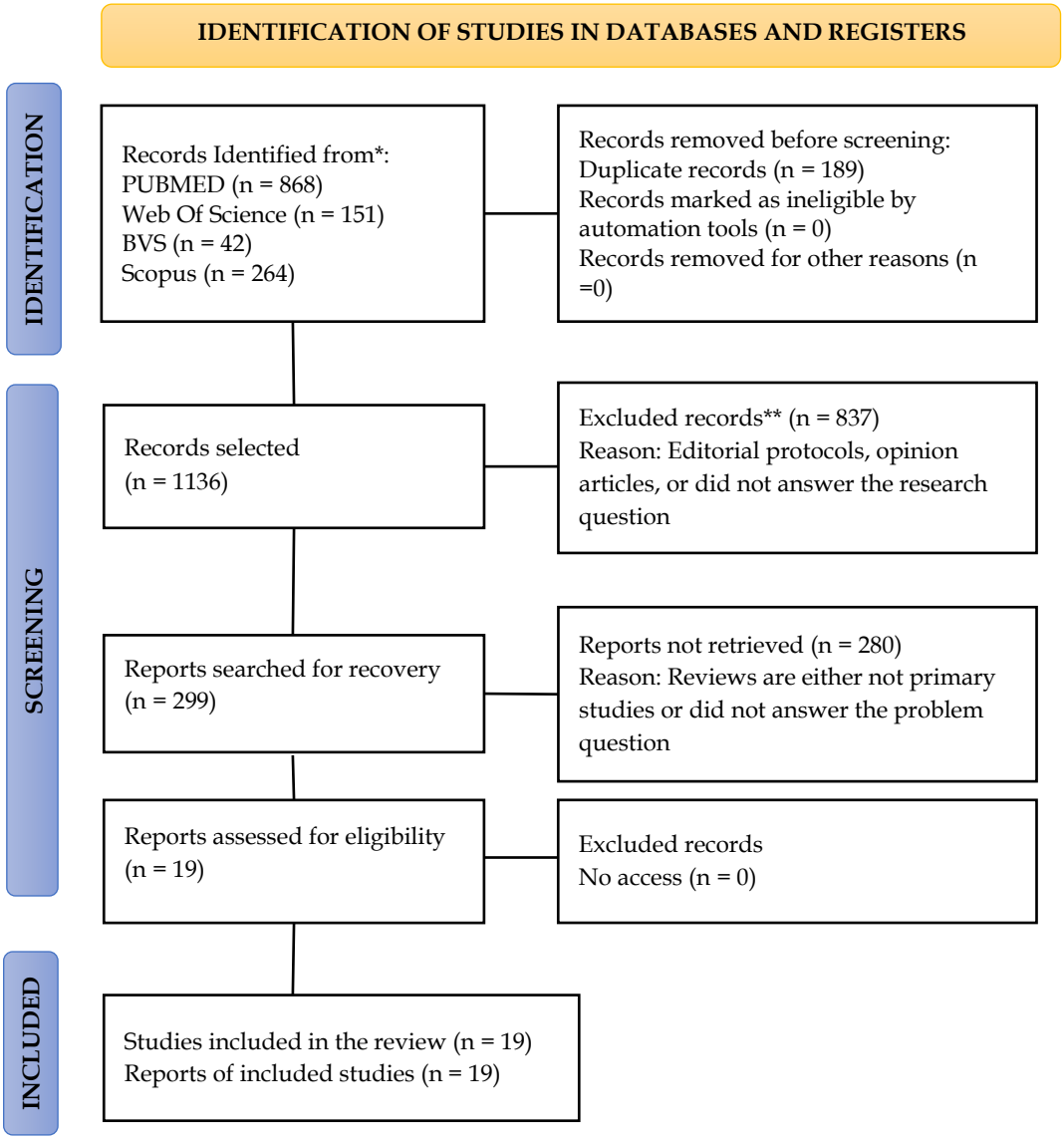
Source: Prepared by the author.

RESULTS

A total of 1,325 articles were identified across the selected databases, with 189 duplicates removed. Thus, 1,136 articles remained for title, abstract, and keyword screening. After this screening process, 837 articles were excluded for being opinion pieces, editorials, or studies whose titles, abstracts, and keywords did not align with the research objective.

In total, 299 articles were assessed in full-text review. Of these, 280 were excluded because they were reviews, not primary studies, or failed to address the research question. As a result, 19 studies were included (Figure 1).

Figure 1. Flowchart. São Paulo, SP, 2024.



Source: PRISMA 2020 flow diagram for new systematic reviews including searches of databases and registers only.[10]

All selected studies were published in English. Notably, three studies (15.8%) were conducted in Israel and three (15.8%) in Brazil. Two studies (10.3%) were carried out in each of the following countries: Spain, Portugal, and Italy. In addition, one study (5.3%) was conducted in each of the following countries: England, Finland, Germany, Colombia, China, and Japan. Furthermore, one study (5.3%) conducted in Switzerland involved collaboration with 15 European Union countries. Among the included studies, 12 (63.2%) were cohort studies and four (21.1%) were case-control studies (Table 2).

Table 2. Description of the studies according to author, year, study location, objective, study type, and main findings. São Paulo, SP, 2024.

Author, year and locus	*Objective*	*Type of study*	*Main results*
López B, 2021, Israel	Estimate the effectiveness of Pfizer-BioNTech BNT162b2 and Oxford-AstraZeneca ChAdOx1-S vaccines against Covid-19 symptoms, hospitalizations, and deaths in participants aged 70 and older.	Case-control study	BNT162b2 had 85% effectiveness after the second dose; ChAdOx1-S had 73%. Hospitalization and mortality risks were reduced by 44% and 51%, respectively, after vaccination.
Haas EJ, 2021, England	Assess overall effectiveness of BNT162b2 in Israeli residents aged 16+, with a focus on those 65 and older.	Cohort study.	Among those aged 65+, effectiveness was 94.8% for infection, 96.4% for symptomatic cases, 96.8% for hospitalizations, and 96.9% for deaths. Higher effectiveness in those aged 75 and 85+. Broad vaccination reduced infections, severe hospitalizations, and deaths across all age groups.
Glatman-Freedman A, 2022, Israel	Assess effectiveness of a third (booster) dose of BNT162b2 in reducing disease complications across age groups.	Cohort study.	Initial booster effectiveness: 80.9%, decreasing to 61.3% after 20 weeks. Reductions: hospitalizations (54.9%–95%), severe illness (58.6%–100%), mortality (49.1%–100%). Booster highly effective against Delta variant.
Baum U, 2022, Finland	Estimate vaccine effectiveness against severe Covid-19 in individuals aged 70+ in Finland.	Cohort study.	Effectiveness against hospitalizations: 93% after second dose, 95% after third dose. High effectiveness against ICU admissions.
Rivasi G, 2022, Italy	Investigate long-term impact of BNT162b2 on infection rates in nursing homes in Florence.	Cohort study.	Infection rates remained low (0.4%) up to 6 months post-primary vaccination; increased afterward. Mortality remained lower compared to unvaccinated or pre-vaccination period.
Gomes D, 2021, Germany	Evaluate BNT162b2 effectiveness against SARS-CoV-2 infection and severe outcomes in octo- and nonagenarians.	Cohort study.	Vaccine effectiveness for new infections 68.3%, for new hospital infections: 73.2% and for deaths: 85.1%. Significant risk reduction compared to unvaccinated.
Ko YK, 2022, Japan	Estimate vaccine effectiveness against death and case fatality rate (CFR) by age during Alpha and Delta variant periods in Tokyo.	Epidemiological modeling	Vaccine effectiveness exceeded 97% for death. Simulation showed significant mortality reduction with vaccination. Effectiveness declined with age.
Goldin S, 2022, Israel	Assess outcomes in institutionalized elderly: (a) documented SARS-CoV-2 infection, by positive PCR test, followed by death; (b) Covid-19 death, by positive PCR test, followed by death; (c) all-cause mortality, regardless of PCR test and (d) documented SARS-CoV-2 infection or death.	Cohort study.	During the 5-month follow-up, the vaccine's efficacy showed proportional mortality from Covid-19 of 21.9% in the vaccinated population and 30.6% in the unvaccinated population.
Cabezas C, 2021, Spain	Assess association between BNT162b2 vaccination and infection, hospitalization, and death in nursing home residents, staff, and healthcare professionals.	Cohort study.	Vaccine effectiveness: 50% with one dose, 90% with two. Hospitalizations reduced by 95%, deaths by 97% after full vaccination.
Arregocés-Castillo L, 2022, Colombia	Evaluate vaccine effectiveness in adults aged 60+ in Colombia.	Cohort study.	Vaccine effectiveness 61.6% for hospitalization, 79.8% for death with hospitalization, 72.8% for death without hospitalization.
Ranzani OT, 2021, Brazil	Estimate effectiveness of CoronaVac vaccine in older adults population (70+) during Gamma variant period in São Paulo.	Case-control study	The study population included individuals aged 70 and over, the vaccine efficacy of CoronaVac against symptomatic infection was 47%, against hospitalizations for Covid-19 was 56% and against deaths from

			Covid-19 was 61%, in addition, vaccine efficacy showed a decrease with increasing age.
Mattiuzzi C, 2023, Italy	Assess effectiveness of additional booster doses in elderly, especially 80+.	Cohort study.	It is possible to analyze that the rate of hospitalizations, ICU admissions and deaths from Covid-19 decreased progressively between people who were not vaccinated and those who had two booster doses. In addition, the study shows that the immunity conferred by the vaccine decreases over time, indicating that booster doses are advantageous for the elderly. However, as vaccine efficacy tends to decrease over time, more studies are needed to assess the continued effectiveness of boosters.
Barandalla I, 2021, Spain	Analyze the impact of vaccination against Covid-19 on the reduction of hospitalizations caused by SARS-CoV-2 infection in Spain.	A cross-sectional study.	Vaccination reduced hospitalizations by nearly 91%, with significant reduction in those over 80 and subsequently those over 70.
Hitchings MDT, 2021, Brazil	Assess vaccine effectiveness after one or two doses in individuals aged 60+ during Gamma variant predominance in São Paulo.	Case-control study	One dose effectiveness against symptomatic Covid-19 was 33.4%, two doses 77.9%. ChAdOx1 vaccine effectiveness was 55.1% against hospitalization and 61.8% against death after one dose; 87.6% and 93.6%, respectively, after two doses. In addition, the study revealed that individuals aged 60 or over who had some comorbidity, such as diabetes, had lower vaccine efficacy.
Wan EYF, 2022, China	Assess effectiveness of BNT162b2 and CoronaVac vaccines against Omicron BA.2 variant in elderly.	Case-control study	BNT162b2 with 3 doses: 50.9% effectiveness against infection, 98.4% against mortality. CoronaVac: 75.6% and 54.0% against infection, 96.8% against mortality in those 60+.
Higor SM, 2023, Brazil	Evaluate effectiveness of CoronaVac against severe Covid-19 infections in Fortaleza.	Cohort study.	Effectiveness after two doses: 55.8% against hospitalization, 68.4% against ICU admission, 82.3% against Covid-19 deaths. In addition, greater vaccine effectiveness for hospitalizations was observed in women and in individuals aged 60-69.
Nunes BR, 2021, Portugal	Understand vaccine effectiveness against severe Covid-19 and death in 1,880,351 Portuguese aged 65+.	Cohort study.	For individuals aged 65 to 79, vaccine efficacy against Covid-19-related hospitalizations and deaths was 78% for partial vaccination and 94% for full vaccination. Vaccine efficacy against 0.705 (per 1000 person-years).
Kislaya I, 2022, Portugal	Estimate the vaccine efficacy of the second booster dose against hospitalizations and deaths from Covid-19, in individuals aged 80 and over, in Portugal.	Cohort study.	Effectiveness: 56% with primary series, 63% with first booster, 81% with second booster. Second booster reduced death risk by 49%.
Nicolay N, 2021, Austria, Cyprus, Czech Republic, Estonia, Finland, Greece, Ireland, Latvia, Malta, Portugal, Slovenia, Spain and Sweden	Evaluate impact of Covid-19 vaccination on hospitalizations and deaths in those 80+.	Ecological study	Hospitalizations and deaths reduced with higher vaccine uptake. The variations in rates between countries are due to the high vaccination uptake in that country, which shows greater reductions.

Source: Prepared by the author.

Given the above, all studies linked Covid-19 vaccination to reduced mortality in the older adults population. Moreover, vaccine efficacy was analyzed regarding the reduction of cases, hospitalizations, and deaths due to the disease.

Some studies examined the decline in hospitalization and death rates from Covid-19 among vaccinated and unvaccinated individuals aged 60 years or older[11,13-18,20,25,27-29]. Results indicate that vaccinated older adults have a substantially lower risk compared to unvaccinated ones, especially regarding severe disease development and death. For example, the risk of hospitalization for vaccinated older adults is 44% lower, and the risk of death is 51% lower compared to unvaccinated older adults.[11]

Other studies analyzed vaccine effectiveness against asymptomatic and symptomatic infections, hospital admissions, severe hospitalizations, and/or Covid-19-related deaths[11,12,15, 16,19-21,23,24,26-27]. These studies demonstrated that the available vaccines confer reductions in new infections, as well as decreased disease severity and significant protection against hospitalizations and deaths. Furthermore, vaccines protect against multiple variants of concern, including Delta and Omicron. It was observed that the Pfizer-BioNTech BNT162b2 vaccine provided significant protection in these categories, showing efficacy of 90% in individuals aged 75 years or older and 80% in those aged 85 years or older.

The decline in vaccine efficacy with increasing age and/or presence of comorbidities was also evidenced[14,17,21,22,24], which is explained by reduced immunity in older adults and the chronic nature of some comorbidities that lead to increased vulnerability to infection.

Additionally, studies analyzed the effectiveness of booster doses against Covid-19[13,22,25,28], showing that administration of booster doses in older adults increased protection against new SARS-CoV-2 infections and provided a durable antibody response. These findings highlight the importance of vaccination strategies aimed at maximizing individual protection in the older adults population.

DISCUSSION

The literature mapping on the dynamics of Covid-19 vaccination, considering the number of doses and vaccine manufacturers, identified findings that help to understand changes in severity and mortality rates. The evidence of vaccine protection efficacy is directly related to the reduction of severe hospitalizations and deaths from Covid-19 among older adults.

The frailty of older adults classifies them as a high-risk group for severe forms of Covid-19, due to immunosenescence and the presence of comorbidities such as hypertension, diabetes mellitus, cardiovascular diseases, chronic respiratory diseases, and renal failure, which contribute to adverse Covid-19 outcomes.[6]

The state of chronic systemic inflammation caused by comorbidities and aging itself increases the inflammatory response to the virus, releasing a large amount of cytokines. Furthermore, Covid-19 caused multisystem dysfunction in older patients, leading to damage to multiple organs and decompensation, especially in those with comorbidities.[6]

through the inoculation of a suspension containing inactivated or attenuated microorganisms, or antigens that stimulate the immune system to produce immunity against the infectious agent. Thus, the MHC-antigen complex, formed by macrophages or dendritic cells, signals T lymphocytes, activating them to stimulate the clonal expansion of effector T cells and memory T cells. Therefore, the goal of vaccination is to induce the production of memory cells against an antigen, enabling the body to respond quickly and effectively upon possible subsequent exposure.[30]

In Brazil, the National Health Surveillance Agency (*Agência Nacional de Vigilância Sanitária*, Anvisa) approved the use of the Pfizer (5-cap mRNA), Janssen Pharma (Ad26.COV2.S), AstraZeneca (AZD1222), and Sinovac-CoronaVac vaccines. Pfizer requires two doses with an interval of up to 12 weeks, using an innovative technology (mRNA) that contains synthetic biological material encoding the SARS-CoV-2 genetic code. AstraZeneca also has a two-dose schedule with a 12-week interval, utilizing a technology based on a genetically modified chimpanzee adenovirus that carries the DNA of the key protein that triggers the infectious process.[31]

Regarding Janssen, it is a single-dose vaccine that uses technology similar to AstraZeneca's, with a replication-incompetent adenovirus (Ad26). The Sinovac-CoronaVac vaccine consists of two doses administered four weeks apart and was developed using inactivated virus. The inactivated virus is phagocytosed, which triggers T-helper lymphocyte activation and consequently stimulates the immune system.[31]

For prolonged immunization, the São Paulo City Hall, through Instruction No. 35, included an Additional Dose for individuals aged 85 years or older who had received their second or single dose at least six months prior, regardless of the vaccine used. The second additional dose (fourth dose) was introduced in Instruction No. 47 for individuals aged 70 years or older and administered at least four months after the last dose of the vaccination schedule (third dose). For the start of Bivalent booster vaccination (Pfizer mRNA), Instruction No. 03/2023 maintains the recommendation to respect a four-month interval from the last dose (fourth dose) and to administer a second dose six months after the first dose of the Bivalent vaccine. According to data from the São Paulo State Government's Vaccinometer, 12,532,404 first doses and 3,711,360 Bivalent booster doses were administered, showing a decline in adherence; older adults aged 60 to 80 years or older accounted for 1,574,322 of the Bivalent booster doses administered.[32-35]

The World Health Organization (WHO), together with the Pan American Health Organization (PAHO), recommended in 2023 a booster dose for high-priority risk groups and those at higher risk of severe disease progression and death. Even minimal decreases in vaccine efficacy can lead individuals to develop severe illness. Thus, high-priority groups include older adults aged 75 years or older and those aged 60 to 75 with comorbidities, for whom an additional dose is indicated six months after the last dose.[36]

The elderly group, classified as high priority, is directly related to immunosenescence, a natural process characterized by a decline in immune function, altering the capacity to induce innate and adaptive immunity. This process results in decreased phagocytic response, directly impairing vaccine response since greater phagocytic activity improves antigen uptake and enhances stimulation of cells to induce adaptive immunity, thereby affecting vaccine efficacy.[30]

However, despite the reduced immunological capacity of older adults to induce innate and adaptive immunity, Glatman's study found high vaccine efficacy against Covid-19. The BNT162b2 (Pfizer-BioNTech) and ChAdOx1-S (AstraZeneca) vaccines provided immunization rates of 85% and 73%, respectively, in participants aged 70 years or older after two doses, with the risk of hospitalization in vaccinated elderly reduced by 44% and the risk of death by 51% compared to unvaccinated individuals.[11]

Continuous evaluations of the BNT162b2 (Pfizer-BioNTech) vaccine showed protection exceeding 90% in individuals aged 65 years or older against SARS-CoV-2 infection, asymptomatic infection, symptomatic Covid-19, severe or critical hospitalization, and Covid-19-related death. For individuals aged 75 years or older, protection remained above 95%, and for those aged 85 or older, efficacy was 80% across all infection categories mentioned earlier.[12]

Vaccination during disease outbreaks yielded positive results, with vaccine efficacy considered at 95% after two doses, alongside a significant reduction in severe cases in individuals aged 65 or older. Moreover, vaccination had a significant impact in reducing hospital admissions, especially among those over 60 years old, preventing a fourth wave of hospitalizations in Europe during 2021.[23,37]

In the first ten months after vaccination began in Londrina, Paraná (Brazil), 75% of Covid-19 deaths occurred among unvaccinated older adults; those who did not complete the vaccination schedule or refused the vaccine had a mortality rate 33 times higher than those who received three doses.[38]

The significant impacts can be explained by the large-scale vaccination progress in the older adults population, which resulted in better pandemic control, prevention of severe disease outcomes potentially leading to death, and vaccine efficacy and safety. These factors together benefit the population by significantly reducing hospitalizations and deaths.[23]

It is noteworthy that vaccine efficacy and the risk of Covid-19 worsening are also influenced by the presence of comorbidities. A United Nations report states that 66% of older adults aged 70 or older have some comorbidity. Thus, the pandemic highlighted the vulnerability of the elderly to the virus and the need for healthy aging.[39]

In this sense, aging is considered a natural life process, not necessarily indicative of disease, since numerous external and internal factors contribute to the development of comorbidities, such as decreased immune system activity, lack of physical activity, unhealthy diet, and genetic predispositions.[40]

Therefore, it is not possible to generalize the relationship between advanced age and disease presence; however, diseases in this age group cause a chronic inflammatory state in the body, making the elderly more susceptible to severe conditions such as Covid-19.

Furthermore, the older adults population has a reduced capacity to maintain vaccine-induced immunity against Covid-19, resulting in decreased antibody levels over time and creating the need for booster doses to increase protection and sustain reductions in hospitalizations and deaths. Additional

studies are needed to evaluate the efficacy of continuous boosters in older adults, investigating antibody durability to plan future immunizations.[13,22]

Several factors influence older adults' adherence to vaccination, including lack of knowledge, misinformation, low education levels, beliefs about vaccine safety and efficacy, and social vulnerabilities, which contribute to declining vaccine and booster dose uptake, increasing the risk of disease outbreaks. Gender, age, social vulnerability, and health status affect vaccine acceptance, with lower acceptance observed among women and individuals over 70 years old, who exhibit greater vaccine hesitancy.[41-42]

In Switzerland, vaccination rates stagnated due to population resistance, lack of trust in government and science, and fear of side effects. In Brazil, despite vaccination progress, hesitancy persists due to beliefs that vaccines contain toxic elements or cause illness, which undermines ongoing immunization efforts.[43-44]

It is understood that analyzing the reduction in Covid-19 mortality among the elderly post-vaccination is complex, as it involves factors such as comorbidities, dosing intervals, and booster adherence to maintain high immunity levels. It is emphasized that health policies, individual behaviors, beliefs, and healthcare access can influence vaccination outcomes.

Indeed, immunization significantly contributes to reducing deaths among older adults, highlighting the necessity of booster doses due to immunosenescence and declining immune system function. Thus, the ongoing challenge remains vaccine adherence, as lack of knowledge, misinformation, fake news, and socioeconomic issues substantially impact Covid-19 vaccination.

Limitations of this study include its broad scope without analysis of evidence levels, which are crucial for understanding Covid-19 vaccine effectiveness in the older adults population. Additionally, this review included only studies available in full text in Portuguese, English, and Spanish, and the existence of indexing databases not covered by the search.

CONCLUSION

It is concluded that Covid-19 vaccines demonstrate high efficacy in reducing new infections, hospitalizations, and deaths, underscoring the importance of continued adherence to vaccination in the studied population. Despite the different types of vaccines available, all showed effectiveness in reducing mortality.

This study identified gaps in the literature, such as the impact of comorbidities on Covid-19 outcomes in older adults. Further research is necessary to clarify how various comorbidities influence immune response to vaccination in this population, along with investigations into post-pandemic outcomes. In relation to vaccine hesitancy, there is an urgent need to develop effective strategies to address a growing problem that extends beyond Covid-19 and affects adherence to other immunizations.

Additionally, few studies examine the optimal interval for booster doses in older adults, aiming to maintain high antibody titers and to understand the immune system's response, particularly in those with comorbidities.

Understanding vaccine effectiveness against Covid-19 and its impact on older adults is essential for nursing professionals, enabling them to promote health education and address concerns, given that misinformation, insecurity, and fake news have adversely affected vaccination coverage. The literature indicates that vaccination played a crucial role in preventing severe disease in this population, and qualified professionals can develop ongoing prevention campaigns and strategies, emphasizing the importance of booster doses to sustain adequate immunity levels. Finally, the study reinforces the need for public policies that promote healthy aging and encourage healthy lifestyle practices, ensuring better quality of life for older adults.

CONTRIBUITIONS

Contributed to the conception or design of the study/research: Silva CC, André SCS. Contributed to data collection: Silva CC, André SCS. Contributed to the analysis and/or interpretation of data: Silva CC, André SCS. Contributed to article writing or critical review: Silva CC, Scléa ACRL, André SCS. Final approval of the version to be published: Silva CC, Scléa ACRL, André SCS.

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