



# COVID-19 Vaccine Effectiveness on the Severity of Disease: A Case-Control Study in Southeastern Iran

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## ABSTRACT

**Introduction:** Considering the importance of the effectiveness of vaccination in reducing the severity of COVID-19 and mortality, knowledge of the effect of the vaccine on the severity of COVID-19 in communities is critical. Therefore, this study aimed to evaluate the effect of COVID-19 vaccines on the severity of COVID-19 in southeastern Iran (the Bam region).

**Methods and Materials:** A case-control study of a total of 2,082 adults aged 18 years was conducted to evaluate the associations between hospitalization due to COVID-19 and previous vaccination with existing vaccines (including Sinopharm, AstraZeneca and CovIran Barkat) in the country. Multinomial logistic regression was used, and relative risk (RR) and 95% confidence intervals (CIs) were calculated.

**Results:** After controlling for potential confounders, multinomial logistic regression revealed that COVID-19 vaccination reduced the likelihood of hospitalization for males and females in temporary wards (RRmen = 0.22 vs. RRwomen = 0.34), general wards (RRmen = 0.25 vs. RRwomen = 0.31), and intensive care units (RRmen = 0.47 vs. RRwomen = 0.77), with a  $p$  value of 0.001. The RR of hospitalization in all wards decreased for men and women who received Sinopharm or AstraZeneca and for women who received the Barkat vaccine. However, only a significant difference was detected in the reduction in patients who received the Sinopharm vaccine ( $p = 0.001$ ).

**Conclusion and Discussion:** The findings show that vaccination is related to reducing the severity of the disease in the hospital. Therefore, increasing the vaccinated population can reduce the severity of COVID-19 and the need for intensive care in hospitals.

**Keywords:** COVID-19, Hospitalization, SARS-CoV-2, Vaccines