COVID-19 PATIENTS WHO DISCHARGE WITH HOME OXYGEN HAVE LOWER READMISSION RATES THAN COVID-19 PATIENTS WHO DISCHARGE WITHOUT OXYGEN

by

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ABSTRACT

COVID-19 PATIENTS WHO DISCHARGE WITH HOME OXYGEN HAVE LOWER READMISSION RATES THAN COVID-19 PATIENTS WHO DISCHARGE WITHOUT OXYGEN

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The purpose of this study was to explore what the best care should be at discharge after being diagnosed with COVID-19. This was a retrospective study using data from electronic health records. Patients discharged to home with oxygen (O2) were less likely to be readmitted within 30 days. Linear Regression was computed to determine variables that could predict if discharge with and without O2 would affect readmission rates. When adjustments were made for co-variants, it was determined that patients having been in the ICU on the ventilator were 2.6 times more likely to be readmitted within 30 days. However, COVID-19 patients needing O2 after discharge had reduced readmission rates. Therefore, O2 at discharge for COVID-19 patients helps prevent readmissions within 30 days.

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CHAPTER 1

INTRODUCTION

1.1 COVID-19 Statistics

In 2020, COVID-19 was the third leading cause of death, with 1.8 million deaths reported (CDC, 2022; WHO, 2023). The most common comorbidities occurring alongside COVID-19 were cardiovascular disease, diabetes, and chronic lung disease (Stokes et al., 2020). There was a total of 5,817,385 cases of COVID-19 reported through May 30 of 2020. Those who recovered and returned home have had a long recovery period, some are classified as long COVID-19 (NIH, 2021)

Long COVID-19 is a topic of discussion investigating why some people who had COVID-19 have prolonged symptoms (NIH, 2021). These patients often experience prolonged fatigue, chronic coughs, shortness of breath, brain fog, fever, and depression. Further investigations are reportedly being done to gather data from affected individuals on the lasting effects they are experiencing. Many patients being discharged to home have been reported to have relapses, which then causes the need for readmissions.

1.2 Literature

Verna et al. (2022) conducted a study on readmissions of patients with COVID-19 from February to June 2020. They analyzed data from 267 hospitals across the United States. It was reported that 3.6% of patients readmitted were more likely to have diabetes, hypertension, cardiovascular disease, or chronic kidney disease in high occurrence.

A majority of the data focused on the prevalence of risk factors in relation to being readmitted. Further research is needed to explore reasons why patients are readmitted and to investigate interventions that would help prevent readmissions. This study also reported that of those readmitted, 12.3% died of causes, such as the need for oxygen therapy and complications of sepsis (Verna et al., 2022). Comorbid diseases, such as diabetes mellitus and hypertension, are prevalent risk factors in association with readmission. These two diseases were highest in readmitted patients with comorbidities. For patients with a history of diabetes, 419 were readmitted, and for patients with a history of hypertension, 652 were readmitted.

1.3 Purpose

There have been no studies found that discuss how readmissions were related to patients receiving or not receiving oxygen therapy upon discharge home. This is the identified gap in knowledge that the research team will be examining. The purpose of this study is to explore readmission rates of patients with COVID-19 discharged to home with oxygen compared to those discharged to home without oxygen. This information may help to reduce 30-day readmission of long COVID-19 patients. While there is some information already published on COVID-19 patients and readmissions, little is known about the patterns of care that will improve discharge treatment for patients diagnosed with COVID-19.

CHAPTER 2

LITERATURE REVIEW

2.1 Risk Factors and Readmission with COVID-19 Patients

Verna et al. (2022) conducted a study using a population of COVID-19 patients. The focus was on the prevalence of risk factors related to readmissions. It was determined that many subjects had preexisting conditions, such as diabetes, hypertension, cardiovascular disease, and chronic kidney disease. After being diagnosed with COVID-19 and being in the hospital for healthcare needs, many of them were able to be discharged to home after they recovered. It was not clear if the patients who died (12.3%) were discharged to home with or without supplemental oxygen. Had they been discharged to home with oxygen, could readmission have been avoided?

2.2 Oxygen Upon Discharge for COVID-19 Patients

Banerjee et al. (2021) analyzed data about patients who were given oxygen upon discharge with COVID-19. The goals of the study were aimed at optimizing patient outcomes with COVID-19. The researchers also wanted to discharge patients stable enough to be at home with supplemental oxygen, given that they met the criteria. This entails being able to self-manage or having a caretaker assist in managing care for oneself. This criterion is referred to as expected practice (EP) and has information regarding the use of home oxygen to enable earlier discharges. This then increased the availability of acute care for other patients with COVID-19. The readmission rates for COVID-19 patients were at 8.5 % after being discharged to home on oxygen.

The readmissions occurred within 30 days of initial discharge. Being discharged on home oxygen may have been the reason for a small percentage of readmissions. Mortality rates were also low at 1.3%. The researchers covered in detail how patients were checked on after discharge. For example, teaching patients about care at home that included safety precautions with oxygen, making daily follow-ups with patients who required 3 liters (L) of oxygen via nasal cannula, and how to watch for an oxygen saturation level of at least 92%. And lastly, increasing patient safety by monitoring patients' conditions outside of the hospital environment.

This study does not reveal why patients were readmitted, nor the diagnosis for readmission. The patients were discharged with COVID-19 and received oxygen on discharge. However, not much else is discussed regarding why these patients were readmitted. The authors did report low readmission rates and low mortality rates. Patients reaching 92% oxygen level with at least 3L of oxygen via nasal cannula met the criteria to be discharged. While this was a benefit to increasing hospital bed availability, 92% oxygen saturation is inadequate for the average person. However, further research is needed to better understand why patients are readmitted and how the use of O2 upon discharge affects these rates.

2.3 Readmission Patterns and COVID-19

Subramaniam et al. (2021) conducted research investigating the readmittance of patients diagnosed with COVID-19. In this study, data was analyzed from January 2020 to December 2020. Data collection included incidence, characteristics, and outcomes of readmitted patients. There were 547 patients followed for readmission. It was reported that 52.5% of 547 patients were readmitted for problems with oxygenation.

Specifically, patients were presenting to the emergency department in respiratory distress. This study very briefly covers the results of patients being readmitted after recovering from COVID-19 and then being readmitted in respiratory distress. The characteristics found in patients readmitted included comorbidities, such as diabetes, hypertension, kidney disease, and cardiovascular disease. These were also reported in the study conducted by Verna et al. (2022). These may indicate that patients with the same risk factors and comorbidities could possibly benefit from oxygen at discharge.

Choi et al. (2021) looked at what factors contribute to readmissions among recovered COVID-19 patients. Included are discussions on how to prevent readmissions of COVID-19 patients. Similar results relating to comorbidities were found in readmitted patients. Additionally, they reported the average age for patients readmitted was around 71 years old. This study includes more information regarding the oxygenation status of patients. Among common reasons for readmission patients experienced hypoxia, dyspnea, and altered mental status. This might indicate a need for oxygenation. As discussed in this study, respiratory issues causing admission to the hospital have been noted as a natural progression to the diagnosis of COVID-19. However, it was also reported that some patients were being discharged with borderline oxygenation problems. Their oxygen content would measure at 90% or less before discharge, which was just good enough to come off oxygen. These patients would then be classified as good enough to be discharged to home. It was not high enough to be considered a healthy oxygen level, which could be as high as 98%. It was suggested by the authors that monitoring oxygen levels while at the hospital as well as after discharge is crucial.

A study by O'Carroll et al. (2020) includes a group of 18 patients with only four being readmitted. Of those readmitted, three patients had either worsening hypoxia related to COVID-19, progressive infiltrates in the lung causing the inability to breathe, or pneumonia. This study analyzes a small sample of patients discharged with COVID-19 pneumonia, monitoring their oxygen saturation after discharge. Like Banerjee et al. (2021), this study involved those who were discharged and were monitored at home after discharge.

The authors report that only patients with pulmonary infiltrates were enrolled in the study to be monitored at home. To understand what care needs to be provided and when the discharge should occur, more research needs to be done on the larger population of patients being discharged to home. There is also a lack of knowledge regarding discharge care for patients who have had COVID-19. Additionally, more information is needed regarding those having O2 upon discharge, those who did not have O2 upon discharge, and the effects of long-term COVID-19 patient outcomes. Currently, some clinics are being opened to specifically care for long-COVID-19 patients (NIH, 2021). Healthcare personnel need to know more about discharge status, oxygen levels, and readmission diagnoses to better help the long COVID-19 patients (NIH, 2021).

Gwin et al. (2021) provide an analysis of readmissions after being hospitalized with COVID-19. In this study, data was analyzed from emergency department visits, and results showed 50% of the revisits were patients with worsening COVID-19 symptoms.

Atalla et al. (2021) solely focused on the readmissions of patients with COVID-19 at the start of the pandemic. Variables included age, comorbidities, insurance, and race. Discharge planning considered whether patients were able to wean off supplemental

oxygen and if their oxygen saturation improved. This study differs from others in that the sample size was 339, and of these patients, 6.8% were readmitted within 30 days. Of the 19 patients readmitted, eight required supplemental oxygen via nasal cannula upon readmission.

Taupin et al. (2021) focused on gaining knowledge to prevent readmissions with patients who have a diagnosis of COVID-19. A retrospective review of 576 participants was conducted. Of the sample, 55 of them were readmitted within 30 days. It was also found that of the readmissions many had worsening or persistent COVID-19. No mention was made of discharge criteria that did or did not include oxygen.

Drewett et al. (2021) analyzed data from March to October 2020, looking at 160 patients diagnosed with COVID-19. This study reported that 48 out of 160 patients admitted for COVID-19 symptoms required supplemental oxygen. Of the 48 patients requiring supplemental oxygen during their stay at the hospital, eight were readmitted after discharge. Similarly, three out of nine patients required a high-flow nasal cannula during their hospital stay with COVID-19 and were readmitted later. It is important to note that this study focused on readmission data in areas with lower COVID-19 cases. The study did not focus on oxygen at discharge specifically for COVID-19 patients.

2.4 Comparing the Literature

Lavery et al. (2020) detail a focused analysis regarding patients with COVID-19 being discharged and their readmission to the same hospital. This study is different from others as it provides a very large sample of 126,137 patients. Among these patients, a total of 9% were readmitted, and patterns were found associated with their readmission. Verna et al. (2022) and Choi et al. (2021) found comorbidities were strongly associated

with readmissions, as did Lavery et al. (2020). Furthermore, the age of 65 and older was a characteristic shared among readmitted patients. Many readmissions were seen among patients who were discharged to home health or to a skilled nursing facility instead of home. The authors suggested that further studies need to detail diagnoses during readmissions so that COVID-19 can be better understood. It is important to note that there is no analysis of patients discharged with or without oxygen in this study, which could be a factor regarding readmissions.

2.5 Research Purpose

There is little known about the patterns of readmissions related to discharge and the use of O2 upon discharge. Therefore, the purpose of this study is to explore readmission rates of patients with COVID-19 discharged to home with oxygen compared to those discharged to home without oxygen. The patterns analyzed will hopefully help healthcare personnel to begin a discussion on the best care for COVID-19 patients to reduce readmissions in the future.

CHAPTER 3

METHODOLOGY

This is a retrospective study involving the extraction of data from electronic health records in a large organization. This method will allow patterns of care to be examined. Additionally, it will potentially help to better care for patients upon discharge.

3.1 Sample

This study was designed with variables that would provide a view of COVID-19 patients, readmissions, and O2. Variables looked at included gender, ethnicity, race, primary language, patient disposition, emergency room admittance, discharge with home O2 (entire sample), discharge with home O2 (emergency department patients), discharge with home O2 (in-patient services patients), readmittance within 30 days of those receiving home oxygen therapy, patients in the intensive care unit (ICU), patients on a ventilator, length of stay, patients age at admission, and last pulse oximetry. Oxygen was reviewed as none, 1-2 Liters, 3-4 Liters, 5-6 Liters, or greater than 6 Liters. Patients were identified as being in the ICU and if they were on the ventilator. Some may have been in the ICU, but not on the ventilator. The length of stay was reviewed as less than a day, 1-5 days, 6-10 days, and greater than 10 days. Readmission was looked at within 30 days and if the readmission was related to COVID-19 or not. Then demographics of gender, ethnicity, primary language, race, and where they were discharged were reviewed. Places of discharge included home health care, extended care, court/law enforcement, or a

nursing facility. Patients admitted to the emergency department (ED) or other in-patient services were analyzed.

3.2 Data Extraction

Because it is a research study and medical record numbers had to be accessed to look at 30-day readmissions, the study had to go through the Institutional Review Board (IRB) approval process. The study did not require patient consent or notification since it was a retrospective study that did not include intervention. Data concerning patients having COVID-19 and readmissions were extracted for analysis.

Data was extracted by the technology group of a major healthcare system for this study. This included 15 different entities of the organization. The data accessed was from one hospital during the start of the COVID-19 pandemic and included the dates March to September of 2020. The timeline chosen was because data needed to reflect patients having been discharged to home after having COVID-19. Readmissions also needed to occur within the timeline of this study. The technology group met with the researchers to go over the database that initially included 8,641 subjects.

3.3 SPSS, Descriptive Data, and Linear Regression

The statistical package for the social sciences (SPSS) was used to analyze data. First, descriptive data was analyzed using percentages and frequencies. Next linear regression was used to analyze readmissions with and without oxygen. Lastly, the independent effect of home oxygen was estimated using a Chi-Square analysis.

3.4 IRB Training

The IRB committee required the completion of the Human Subject Protection and Research HIPAA course. These courses were designated for researchers. Upon course completion, new team members could be added to the study.

The courses specified how patient information must be protected in the process of data collection and analysis.

CHAPTER 4

RESULTS

Descriptive statistics included percentages that were calculated based on what was found in the electronic health records. For gender, 54.7% were female and 45.3% were male. Ethnic groups included were 38.5% Hispanic, 57.8% non-Hispanic, and 3.8% unknown. Race was comprised of 2.9% that were Asian, 22.2% Black, 0.5% Native American or Alaska Native, 0.3% Native Hawaiian or other Pacific Islander, 2.4% were two or more races, 6.6% were unknown, and 65.1% were white. Primary language data included 83.5% speaking English, 13.9% speaking Spanish, and 2.6% speaking another language.

Disposition details the patients' discharge location. For example, they were discharged to home, nursing home, extended care, or prison. Cases were removed if they did not receive a physician order for home O2 or would not have been readmitted. The cases removed included subjects who died or were discharged to a federal hospital, discharged to hospice, left against medical advice, transferred to acute care, transferred to a cancer center or children's hospital, or transferred to other non-residential arrangements. Descriptive statistics of disposition show 0.2% of patients being discharged to court/law enforcement/jail/prison. Home health care accounted for 2.9% of patient discharges to residential arrangements, and home or other long-term residential arrangements was the largest disposition of patients at 93.3%. Lastly, patients transferred to a nursing facility accounted for 3.6% of patients.

Emergency department admittance was at 63.8% and admittance to other services was at 36.2%. The probability of being discharged with home oxygen was very different depending on the service to which the patient was admitted. For example, 63.8% of the sample was admitted and discharged from the ED. Patients discharged from the ED with home oxygen (O2) were only two out of 5,045 patients. Discharge with home oxygen when looking at the entire sample of 7,903 subjects was 238 (3%) of the total. Of those admitted to in-patient services, 91% had no home O2 upon discharge, and 9% received home O2.

The most meaningful subsample was the subject discharged from in-patient services receiving O2 (N=2,622). If they had been on the ventilator in the ICU they were more likely to be readmitted.

Home O2 therapy was significantly related to readmission within 30 days (X^2 = 4.696, p = 0.03). The odds ratio is 0.625, which is less than 1, meaning patients discharged on home O2 therapy are less likely (about 38% less likely) to be readmitted within 30 days (not adjusting for other factors).

Linear regression was done by adjusting for confounders, as well as having statistically insignificant variables removed. After co-variant adjustments, it was determined that those having been in the ICU were 2.6-fold more likely to be readmitted within 30 days. Patients who have been on a ventilator were almost twice as likely (1.7-fold) to have home O2 than other COVID-19 patients. Non-white patients were about one and half times (1.5-fold) more likely to go home with home O2 than white COVID-19 patients. Co-variant adjustments were made for age, last SaO2, last S/F ratio (SpO2-

oxygen saturation/FiO2-fraction of inspired oxygen), race, and being on room air at discharge.

Table 4.1: Sex

	Frequency	Percentage
Female	4729	54.7
Male	3912	45.3
Total	8641	100.0

Table 4.2: Ethnicity

	Frequency	Percentage
Hispanic	3323	38.5
Non-Hispanic	4991	57.8
Unknown	327	3.8
Total	8641	100.0

Table 4.3: Primary Language

	Frequency	Percentage
Other	223	2.6
English	7219	83.5
Spanish	1199	13.9
Total	8641	100.0

Table 4.4: Race

	Frequency	Percent
Asian	247	2.9
Black	1915	22.2
Native American or Alaska Native	42	.5
Native Hawaiian or Other Pacific Islander	29	.3
Two or More Races	210	2.4
Unknown	571	6.6
White	5627	65.1
Total	8641	100.0

Table 4.5: Post-Discharge Patient Disposition

	Frequency	Percentage
Court/law enforcement	16	.2
Home health care	232	2.9
Discharge to home or other long-term residential arrangement	7372	93.3
Transferred to nursing facility	283	3.6
Total	7903	100.0

Table 4.6: Emergency Department (ED) Admittance

	Frequency	Percentage
Admitted to other services	2858	36.2
Admitted to ED	5045	63.8
Total	7903	100.0

Table 4.7: Discharge with home oxygen (O2) for patients discharged in the ED

	Frequency	Percentage
None	5043	100.0
Oxygen and Accessories	2	0.
Total	5045	100.0

Table 4.8: Discharge with home O2 (entire sample)

	Frequency	Percentage
None	7665	97.0
Oxygen and Accessories	238	3.0
Total	7903	100.0

Table 4.9: Discharge with home O2 from in-patient services

	Frequency	Percentage
None	2387	91.0
Oxygen and Accessories	235	9.0
Total	2622	100.0

Table 4.10: Readmittance within 30 days with home O2 therapy

	Frequency	Percentage
No	2215	84.5
Yes	407	15.5
Total	2622	100.0

Table 4.11: Variables in the Equation

	B	S.E.	Wald	Df	Sig.	Exp (B)
Age of Admission	.009	.003	10.017	1	.002	1.009
ICU	.961	.126	58.458	1	.000	2.613
Vent Flag	-.679	.268	6.441	1	.011	.507
Last Pulse Ox	.067	.023	8.378	1	.004	1.069
Home O2	-.531	.224	5.636	1	.018	.588
Constant	-8.795	2.249	15.286	1	.000	.000

Note: Variables significantly associated with readmission within 30 days. Notice the negative sign on home O2. This indicates an inverse relationship; patients on home O2 are *less likely* to be readmitted within 30 days adjusting for age, ICU admission, ventilator use, and last SaO2.

CHAPTER 5

DISCUSSION

The purpose of this study was to explore readmission rates of patients with COVID-19 discharged to home with oxygen compared to those discharged to home without oxygen.

Patients on home O2 were less likely to be readmitted within 30 days. This study is supported by previous studies, such as Subramaniam et al. (2021), who reported patient readmittance trends as being characterized by oxygenation problems. Additionally, Choi et al. (2021) discussed patients being discharged while having inadequate oxygenation levels. These patients could have benefitted from receiving O2 upon discharge until their oxygen saturation improved.

5.1 Implications

Nursing implications from this study include educating nursing students on home O2 uses for discharged COVID-19 patients. It is also important for nurses to advocate for their patients and recommend that physicians prescribe home O2 therapy following discharge. Nurses can attend in-services concerning this topic to better care for COVID-19 patients. This can help prevent readmissions. As found in this study, home O2 is beneficial upon discharge for COVID-19 patients. At the very least, there should be a discussion on a protocol that could be put into place regarding O2 levels and standing orders for home O2.

In conclusion, the study found that patients ultimately benefit from having home O2 to prevent readmission. Nurses can use the findings in this study to support their recommendations in practice. For example, nurses can recommend that providers prescribe O2 to patients with a lower-than-normal O2 on room air. There can be a specified time period where oxygen saturation is monitored at home until the patient can be on room air at an appropriate oxygen saturation.

5.2 Limitations

Limitations included delayed access to the electronic health record to obtain data. The electronic health record system began using a different process to extract data, which made it more difficult to access data in a timely manner. Another limitation was that a nurse who had obtained IRB approval at the hospital left employment with little notice. Therefore, the nurse scientist at the facility took over the study to finish it and it took time to change the principal investigator and hire new personnel.

5.3 Future Research

Future research should be conducted to learn about the effects COVID-19 has on certain comorbidities. For example, patients with congestive heart failure (CHF), emphysema, and chronic obstructive pulmonary disease (COPD) could be assessed in a descriptive study to see if home O2 would help to prevent readmission. Specifically, patients with these conditions could be monitored with pulse oximeters. Such as evaluating the O2 level these patients would require to improve their health while ill with COVID-19. Choi et al. (2021) authors suggested monitoring oxygen levels while at the hospital as well as after discharge.

As mentioned previously, Banerjee et al. (2021) analyzed data about patients who were given oxygen upon discharge with COVID-19. In this study, researchers took the steps to analyze patients with oxygen after discharge and incorporated teaching them about monitoring their O2 levels at home. This could be done for other populations as well.

Lastly, the literature has an abundance of data surrounding comorbidities seen with COVID-19. There is an opportunity for researchers to explore the relationship between O2 and COVID-19 patients with comorbidities.

REFERENCES

Atalla, E., Kalligeros, M., Giampaolo, G., Mylona, E. K., Shehadeh, F., & Mylonakis, E. (2021). Readmissions among patients with COVID-19. *International Journal of Clinical Practice*, *75*(3), 1–10.

Banerjee, J., Canamar, C. P., Voyageur, C., Tangpraphaphorn, S., Lemus, A., Coffey, C., Wald-Dickler, N., Holtom, P., Shoenberger, J., Bowdish, M., Yee, H. F., & Spellberg, B. (2021). Mortality and readmission rates among patients with COVID-19 after discharge from acute care setting with supplemental oxygen. *JAMA Network Open*, *4*(4), e213990–e213990.

CDC (2022). 2020 final death statistics: COVID-19 as an underlying cause of death vs. contributing cause.

Choi, J. J., Contractor, J. H., Shaw, A. L., Abdelghany, Y., Frye, J., Renzetti, M., Smith, E., Soiefer, L. R., Lu, S., Kingery, J. R., Krishnan, J. K., Levine, W. J., Safford, M. M., & Shapiro, M. F. (2021). Covid-19 related circumstances for hospital readmissions: A case series from 2 New York city hospitals. *Journal of Patient Safety*, *17*(4), 264–269.

Drewett, G. P., Chan, R. K., Jones, N., Wimaleswaran, H., Howard, M. E., McDonald, C. F., Kwong, J., Smibert, O., Holmes, N. E., & Trubiano, J. A. (2021). Risk factors for readmission following inpatient management of COVID-19 in a low-prevalence setting. *Internal Medicine Journal*, *51*(5), 821–823.

Gwin, M., Saleki, M., Lampert, H., Meo, N., & Bann, M. (2021). Emergency department visits and readmissions after COVID-19 hospitalization: A cross-sectional analysis. *Internal & Emergency Medicine*, *16*(6), 1715–1718.

Lavery, A. M., Preston, L. E., Ko, J. Y., Chevinsky, J. R., DeSisto, C. L., Pennington, A. F., Kompaniyets, L., Datta, S. D., Click, E. S., Golden, T., Goodman, A. B., Mac Kenzie, W. R., Boehmer, T. K., & Gundlapalli, A. V. (2020). Characteristics of hospitalized COVID-19 patients discharged and experiencing same-hospital readmission—United States, March-August 2020. *MMWR: Morbidity & Mortality Weekly Report*, *69*(45), 1695–1699.

NIH builds large nationwide study population of tens of thousands to support research on long-term effects of COVID-19. (2021). National Institutes of Health (NIH).

O'Carroll, O., MacCann, R., O'Reilly, A., Dunican, E. M., Feeney, E. R., Ryan, S., Cotter, A., Mallon, P. W., Keane, M. P., Butler, M. W., & McCarthy, C. (2020). Remote monitoring of oxygen saturation in individuals with COVID-19 pneumonia. *European Respiratory Journal*, 2001492.

Stokes, E. K., Zambrano, L. D., Anderson, K. N., Marder, E. P., Raz, K. M., Felix, S. E. B., Yunfeng Tie & Fullerton, K. E. (2020). Coronavirus disease 2019 case surveillance—United States, January 22–May 30, 2020. *MMWR. Morbidity and Mortality Weekly Report*, *69*.

Subramaniam, A., Zheng Jie Lim, Reddy, M. P., & Shekar, K. (2021). Systematic review and meta-analysis of the characteristics and outcomes of readmitted COVID-19 survivors. *Internal Medicine Journal*, *51*(11), 1773–1780.

Taupin, D., Anderson, T. S., Merchant, E. A., Kapoor, A., Sokol-Hessner, L., Yang, J. J., Auerbach, A. D., Stevens, J. P., & Herzig, S. J. (2021). Preventability of 30-day hospital revisits following admission with COVID-19 at an academic medical center. *The Joint Commission Journal on Quality and Patient Safety*, *47*(11), 696–703.

Verna, E. C., Landis, C., Brown, R. S., Mospan, A. R., Crawford, J. M., Hildebrand, J. S., Morris, H. L., Munoz, B., Fried, M. W., & Reddy, K. R. (2022). Factors associated with readmission in the United States following hospitalization with coronavirus disease 2019. Clinical Infectious Diseases, 74(10), 1713–1721.

WHO (2023). The true death toll of COVID-19: Estimating global excess mortality.

BIOGRAPHICAL INFORMATION

Samantha Landers is graduating in May 2023 with an Honors Bachelor of Science in Nursing. She has been a part of the Honors College since the summer of 2020 and has since completed many research papers. This has allowed her to learn more in-depth nursing knowledge about congenital heart diseases, cystic fibrosis, blenrep (a drug used for treating multiple myeloma), and how COVID-19 patients benefit from having home O2 to prevent readmissions.

During Samantha's time at The University of Texas at Arlington, she has become involved on campus. She is currently the recruitment officer of the Hispanic Students Nursing Association. Her involvement has allowed her to network, be more confident speaking publicly, and meet other nursing students. She is also in the Nursing Mentor Program and has mentored four nursing students.

In July of 2023, Samantha will begin working at UT Southwestern Medical Center. With her area of interest being cardiology, she is grateful to have been given this opportunity. Working at a hospital that serves as a pioneer in research greatly aligns with Samantha's plans to incorporate evidence-based practice as a nurse. Learning is extremely valuable to Samantha and her journey in the Honors College has taught her invaluable skills for the future.