Lee, Madison

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School District Messaging as a Medium of Healthcare for Latino Families

1. **Introduction**

Currently, Latino communities in the United States are disproportionately affected by COVID-19. According to the Center of Disease Control and Prevention, Latino residents of the United States have been three times more likely to become infected as their white counterparts 1. Although other factors such as location, economic status, and housing situation can be attributed to this, various studies show that healthcare messaging plays a significant role in Latino health.

When it comes to viral infection in Latino communities, such as the influenza, a study showed that explicit, targeted recommendations from healthcare providers regarding vaccination and antibiotic were effective strategies for reducing mis- conceptions and improving health behaviors 2. Another study performed suggested that when a healthcare provider demonstrates cultural sensitivity and shares language competence with the receiver, thepatient satisfaction is improved and more behavioral changes are shown 3. That same study demonstrated the important implications of language and cultural awareness in the utilization of health care services by Latinos 3.Effective health communication is culturally adept, guiding the target audience towards behavioral change. For most Latinos in America, that behavior change will occur in the context of the family 4.

The purpose of this study was to evaluate school district provided information as a medium for healthcare for Spanish-speaking families in America. Quantitative analysis was performed to evaluate the relationship between school "messaging" and COVID-19 cases. "Messaging" in this study is defined as specific health-related information on COVID-19 in Spanish. Massachusetts was chosen as the location to collect COVID-19 data from, as the C.D.C. published a report on Latino COVID-19 cases specific to counties as of May 28th, 2020 1. All the data in this study is county specific.

1. **Methods**

Variables:

Predictor Variable: Amount of messaging (High vs. Low)

Outcome Variable: Latino COVID-19 case percentage

Messaging was assessed by independently visiting each school district website and marking down whether the website provided specific health-related information on COVID-19 in Spanish. Many websites provided translate buttons through Google Translate; this was not included as valid messaging. The percentage of messaging for each county was calculated by dividing the number of schools who messaged by the total number of schools. Counties with a percentage of messaging that exceeded 25% were considered "high messaging," and counties that did not meet that criteria were considered "low messaging."

= County Messaging %

School websites that did not message, but instead provided Spanish letters with links to outside resources were marked as "link messaging." A second group was created to cover the gaps between link and regular messaging by calculating the percentage of schools that did both. The cutoff percentage used for high and low messaging was counties that exceeded 36%. The "high" and "low" messaging groups served as the two predictor variables in this study.

The Latino population of each county was attained from the 2010 US census assumptions5. The number of Latino cases provided by the CDC was divided by the Latino population to attain the percentage of COVID-19 Latino cases for each county1.

= % of COVID-19 Latino Cases

A Welch Two-Sample T-test was performed for the two groups. There were two continuous outcome variables (High vs. Low Messaging) from two samples with the same categorical predictor (Latino COVID-19 %) to compare the means between the two samples.

Hypotheses:

H0: There is no statistically significant difference between the true means of Low Messaging and High Messaging groups.

HA: There is a statistically significant difference between the true means of Low Messaging and High Messaging groups.

1. **Results**

**Table 1.** Number and Percentage of Schools with Messaging and Link Messaging in counties of MA

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **County** | **# of Schools with messaging** | **% of Schools with messaging** | **# of Schools with Messaging and Link Messaging** | **% of Schools with Messaging and Link messaging** |
| **Bristol** | 4 | 23.53 | 6 | 35.29 |
| **Essex** | 1 | 3.57 | 16 | 57.14 |
| **Hampden** | 5 | 38.46 | 8 | 61.54 |
| **Middlesex** | 8 | 16.33 | 15 | 30.61 |
| **Norfolk** | 7 | 25 | 10 | 35.71 |
| **Plymouth** | 0 | 0 | 4 | 19.05 |
| **Suffolk** | 1 | 25 | 3 | 75 |
| **Worcester** | 10 | 27.78 | 13 | 36.11 |

**Table 2.** Number and Percentage of Latino Covid-19 Cases in Counties of MA

|  |  |  |  |
| --- | --- | --- | --- |
| **County** | **Latino Population** | **# of Latino Covid-19 Cases** | **% of Latino Covid-19 Cases** |
| **Bristol** | 48609 | 804 | 1.65 |
| **Essex** | 175166 | 4987 | 2.85 |
| **Hampden** | 122656 | 926 | 0.76 |
| **Middlesex** | 133771 | 3174 | 2.37 |
| **Norfolk** | 35339 | 277 | 0.78 |
| **Plymouth** | 21890 | 418 | 1.91 |
| **Suffolk** | 187310 | 4470 | 2.39 |
| **Worcester** | 101336 | 2138 | 2.11 |

The null hypothesis being tested was that there was no statistically significant difference between the true means of the two populations. The alternative hypothesis tested was that there is a statistically significant difference between the true means of the two populations.

Group 1 Results:

The high messaging counties (*M* = 1.510, *SD* = 0.8621) compared to the low messaging counties (*M* = 2.195, *SD* = 0.5285) did not demonstrate significantly better peak flow scores, *t* = 1.3548, *p* = 0.2337.

The statistical test displays with 95% confidence that the interval (-0.6166, 1.9866) contains the true population mean. Because the C.I covers 0 and p > 0.05, we fail to reject the null hypothesis, and there is no statistically significant finding. There was no significant effect of messaging from the sample despite low messaging counties (*M* = 2.196) attaining slightly higher scores than high messaging counties (M = 1.510).

Group 2 (messaging + links) Results:

The high messaging counties (*M* = 2.0275, *SD* = 0.8984) compared to the low messaging counties (*M* = 1.678, *SD* = 0.6683) did not demonstrate significantly better peak flow scores, *t* = -0.62517, *p* = 0.5567.

The statistical test displays with 95% confidence that the interval (-1.7478, 1.0478) contains the true population mean. Because the C.I. covers 0 and p > 0.05, we fail to reject the null hypothesis, and there is no statistically significant finding. There was no significant effect of messaging from the sample despite low messaging counties (*M* = 1.6775) attaining higher scores than high messaging counties (M = 2.0275).

1. **Discussion**

The metrics of the results address the chance that the outcomes were due to random chance, but does not mean a 100% certainty of the results. There is still the possibility that the two groups (high vs. low) differed at baseline for some other reason.

A confounding factor of the present study was the lack of accurate data, concerning the population estimates and COVID-19 percentages. Since COVID-19 data is still developing, the accuracy of information being published varies. C.D.C. officials estimated that the true tally of virus cases was ten times the number of reported cases1. Data on race/ethnicity are missing on almost half of the reported COVID-19 cases6. Other potential drawbacks could have occurred from time discrepancies between COVID-19 data and population data, as well as a human error when inspecting each school website.

Future investigations with a broader scope can be performed to demonstrate that the study was sensitive enough to detect an important clinical effect. An example would be expanding the study to various other states, rather than just M.A. Having a greater sample size would increase the validity of the results and possibly indicate a pattern. A more extensive direction could be distributing a survey directly to Latino parents to examine their involvement with school messaging specifically.

1. **Citations**

1. Jr RAO, Gebeloff R, Lai KKR, Wright W, Smith M. The Fullest Look Yet at the Racial Inequity of Coronavirus. *The New York Times*. https://www.nytimes.com/interactive/2020/07/05/us/coronavirus-latinos-african-americans-cdc-data.html. Published July 5, 2020. Accessed July 17, 2020.

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5. U.S. Census Bureau QuickFacts: Middlesex County, Massachusetts; Hampden County, Massachusetts; Bristol County, Massachusetts; Briar CDP, Texas; Massachusetts. Accessed August 12, 2020. https://www.census.gov/quickfacts/fact/table/middlesexcountymassachusetts,hampdencountymassachusetts,bristolcountymassachusetts,briarcdptexas,MA/RHI725219

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