

Examining self-efficacy and COVID-19 disease prevention behaviors among socially vulnerable populations

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Abstract

Social vulnerabilities are associated with higher COVID-19 disease morbidity and mortality. Primary forms of COVID-19 disease prevention aside from vaccination, are health behaviors including masking, hand washing, social distancing, and staying home when one is sick. Understanding the self-efficacy of these behaviors in vulnerable populations can inform health interventions to improve COVID-19 disease outcomes. A repeated cross-sectional study with three waves (Wave 1 = pilot, Wave 2, $n = 1258$, Wave 3, $n = 477$) was conducted using an online survey. This analysis only included Wave 2 and Wave 3. The study targeted Yakima County, WA, USA, an area with pronounced social, environmental, and health disparities. Measures included demographic, household, and self-efficacy constructs. Binary logistic regression was used to determine which demographic and household factors were related to constructs of self-efficacy. An independent t -test was performed to determine if there were significant differences between population levels of self-efficacy over time (Wave 2 vs. Wave 3). Household size, identifying as Hispanic/Latino, and measures of socioeconomic status were significantly related to various self-efficacy beliefs about COVID-19 disease prevention behaviors and the ability to protect oneself from COVID-19 disease in general. Self-efficacy increased for each measure between Wave 2 and Wave 3 ($p < 0.001$). Socially vulnerable groups continue to experience disparate health

outcomes in the face of COVID-19 disease. Future studies should examine ways to increase self-efficacy among populations that are experiencing lower levels as self-efficacy is a significant factor related to health outcomes.

KEYWORDS

COVID-19, Hispanic/Latino, self-efficacy

1 | INTRODUCTION

Social vulnerability can be defined as a person's individual circumstances or community factors that make that person more at risk or prone to experience a negative outcome (Johnson et al., 2021). Social vulnerabilities are associated with higher COVID-19 disease morbidity and mortality (Centers for Disease Control and Prevention [CDC], 2022a; Kim & Kim, 2020). Indexes have been developed to measure and quantify social vulnerability during disasters (Flanagan et al., 2011), but there are none specifically validated for COVID-19 disease. Social vulnerabilities that specifically overlap with COVID-19 disease susceptibility and severity include but are not limited to age, household composition, socioeconomic status, community capacity, minority status, and speaking English as a second language. In the face of major health threats, natural disasters, and emergencies, socially vulnerable populations are especially at risk (Johnson et al., 2021).

Yakima County, Washington is considered a socially vulnerable region, as the total population is comprised of several socially vulnerable sub-groups, such as migrant farm workers and a large non-English speaking population (Firebaugh et al., 2020). In areas that are designated as high-risk, it is especially important to understand how individuals may fare in the face of new or evolving public health threats. One way to determine a person's individual risk is to understand their own level of confidence or self-efficacy in preventing infection at the individual level.

Self-efficacy is characterized as an individual's own belief in their ability to perform a behavior or to control a specific outcome (Bandura, 2012). Self-efficacy is a classic health behavior theory construct that is included in several major theories aimed at understanding behavioral motivation (Glanz et al., 2015). Self-efficacy has been identified as one of the most significant factors in predicting adherence to a variety of preventative health behaviors in previous research, such as condom use, medication adherence, or exercise participation (González-Castro et al., 2021).

Emerging research on vulnerable populations experiences with COVID-19 disease have found that self-efficacy is important in coping with and preventing COVID-19 disease (González-Castro et al., 2021). Self-efficacy can provide a measure of individual-level confidence in performing prevention behaviors. Prevention behaviors were the first line of defense from COVID-19 disease before widespread vaccination programs. However, as vaccinations prevent severe outcomes but not necessarily infection or reinfection, prevention behaviors remain an important strategy for individual and community protection from COVID-19 disease spread.

This study aimed to assess levels of self-efficacy in COVID-19 disease prevention behaviors in a vulnerable population over time and to determine a relationship between social vulnerability factors and self-efficacy for COVID-19 disease prevention.

2 | METHODS

In 2020, a repeated cross-sectional study was initiated to examine the spread and severity of COVID-19 disease in Yakima County, WA, USA. Between 2020 and 2022 3 survey waves were conducted; Wave 1 data were a pilot; Wave 2 data were collected during May & June of 2021; and Wave 3 data were collected during August and September of 2021. This analysis only included Wave 2 and Wave 3.

Participants, aged 18 and over, living in Yakima County, WA, were recruited to participate in an online survey regarding their attitudes, beliefs, and experiences with COVID-19 disease. The surveys were available in English and Spanish. This analysis includes the second and third waves as they both employed the same recruitment methodology and research questions for this analysis.

2.1 | Instrumentation

Although each survey wave was not identical, questionnaires in both Waves 2 and 3 included demographic questions such as age, Hispanic/Latino identification, household size, eligibility for SNAP/TANF as an indicator of income, education level, speaking English, and gender. Self-efficacy questions were adapted from previous behavioral studies examining health prevention behaviors (Bandura, 2012) as well as emergent COVID-19 disease measurement tools posited by the United States National Institutes of Health, Office of Behavioral and Social Sciences Research (Mehta, 2020) and adding COVID-19 disease protective behaviors such as "I am confident I can...", "stay home when sick, hand wash/sanitize when out in public, wear a mask or facial covering, maintain a social distance in crowds," and finally a global question "I am confident I can protect myself from COVID-19."

2.2 | Data analysis

First, a descriptive analysis of the demographic and self-efficacy data was performed. Secondly, binary logistic regressions were performed to determine whether social vulnerability variables collected were related to self-reported self-efficacy COVID-19 disease prevention behaviors. The β and p -value for each outcome in the combined model were reported, no pseudo-R-squared for the total model was reported. Finally, a comparison between the two groups (waves) was conducted using an independent t -test to see if there were any differences in self-reported self-efficacy between the groups.

This study was approved by the Central Washington University Institutional Review Board in 2020.

3 | RESULTS

The second wave yielded ($n = 1258$) valid responses while the third and final study wave yielded ($n = 477$) (Table 1). The mean age for Wave 2 was 28.9, SD: ± 7.2 and 30.6, SD: ± 11.6 for Wave 3. In both waves, there were a slightly higher proportion of male respondents (Wave 2: 52.5% male, female 39.8%, 7.6% other; Wave 3: 55.3% male, 44.3% female, 0.4% other). Both waves had over half of the respondents identifying as Hispanic or Latino (Wave 2: 57.2%, Wave 3: 54.4%). The median household size for Wave 2 was 3.8, SD: ± 1.4 , and 3.7, SD: ± 1.5 for Wave 3. In each wave, over half of respondents reported having a household member that qualified for SNAP, TANF, WIC, or another financial assistance (Wave 2: 77.1%, Wave 3: 57.9%). A high number of participants (95.8%) preferred to speak English or Spanish in Wave 3, which was only significantly related ($\beta = -2.17$, $p < 0.05$) to the global question "I am confident I can keep myself safe from COVID-19"

TABLE 1 Demographic results of Wave 2 and Wave 3

	Wave 2 (N = 1458)		Wave 3 (N = 477)	
Age (mean)	28.9	SD: ±7.2	30.6	SD: ±11.6
Household size (mean)	3.8	SD: ±1.4	3.7	SD: ±1.5
	%	n	%	n
Gender				
Male	52.5	661	55.3	253
Female	39.8	501	44.3	202
Other	7.6	96	0.4	2
Hispanic/Latino				
Yes	57.2	719	54.4	247
No	42.8	539	45.6	207
SNAP/TANF				
Yes	77.1	970	57.9	276
No	22.9	288	30.5	121
Education				
Grade 11 or below	8.2	102	1.8	8
Highschool/GED	27.4	345	13.6	65
Associates/technical/some college	40.8	513	44.8	201
Bachelors or higher	23.7	298	38.8	174

Note: Missing responses were not imputed, valid % reported.

disease,” and not the other self-efficacy measures, in Wave 2, 95.3% of the participants preferred to speak English, but language preference was not significantly related to any of the factors.

Each vulnerability factor was related to at least one self-efficacy measure, with identifying as Hispanic/Latino, household size, and qualifying for an income assistance program having significant relationships to multiple prevention behaviors. In both Waves 2 and 3, identifying as Hispanic/Latino and household size were negatively related to confidence beliefs about keeping safe from COVID-19 disease (Table 2).

When comparing self-reported levels of self-efficacy between participants in Wave 2 versus Wave 3 via an independent t-test, all comparable measures indicated a significant difference between groups ($p < 0.001$ for all measures) (Table 3). Levels of self-reported self-efficacy were higher in Wave 3 than in Wave 2 for staying home when feeling sick (+9%), washing/sanitizing hands (+11.5%), using a mask or facial covering (+33.9), social distancing (+13.6), and confidence in keeping oneself safe from COVID-19 (+14.9).

4 | DISCUSSION

The results of this study were consistent with emerging COVID-19 disease studies that have highlighted identifying as a minority (identifying as Hispanic/Latino, in this case) and household size as related to negative COVID-19 disease outcomes (CDC, 2022a). The CDC (2022b) includes crowded housing as a risk factor during national disasters. However, in this case, these demographic factors were related to lower perceived self-efficacy in

TABLE 2 Factors related to COVID-19 prevention self-efficacy (binary logistic regression)

I am confident	I can stay home when I feel sick	Wash my hands regularly/use hand sanitizer in public	Use a mask or facial covering when in public	Keep a physical distance in public/crowded spaces	Keep myself safe from COVID-19 disease
Wave 2 (β , <i>p</i> -value)					
Age	NS	-0.33** ($p < 0.001$)	NS	-0.01* ($p < 0.05$)	NS
Gender	NS	NS	NS	0.21* ($p < 0.05$)	NS
Hispanic/Latino	0.35* ($p < 0.05$)	-0.36* ($p < 0.01$)	NS	-0.55* ($p < 0.05$)	-0.45** ($p < 0.001$)
Household size	NS	NS	-0.16** ($p < 0.001$)	-0.15* ($p < 0.01$)	-0.21** ($p < 0.001$)
SNAP/TANF	NS	-0.55* ($p < 0.05$)	NS	NS	-0.31** ($p < 0.005$)
Education	0.25* ($p < 0.001$)	0.43* ($p < 0.05$)	0.14* ($p < 0.05$)	0.38** ($p < 0.001$)	0.35** ($p < 0.001$)
Wave 3 (β , <i>p</i> -value)					
Age	0.06* ($p < 0.05$)	NS	-2.01* ($p < 0.05$)	NS	NS
Gender	0.88* ($p < 0.01$)	NS	NS	NS	NS
Hispanic/Latino	-0.95* ($p < 0.05$)	-0.82* ($p < 0.05$)	NS	-1.35** ($p < 0.001$)	-1.16** ($p < 0.001$)
Household size	NS	NS	-0.23* ($p < 0.05$)	NS	-0.26* ($p < 0.05$)
SNAP/TANF	-1.1* ($p < 0.01$)	-0.82* ($p < 0.05$)	-1.07* ($p < 0.05$)	-1.34** ($p < 0.001$)	NS
Education	NS	NS	0.46 ($p < 0.05$)	NS	NS

* $p < 0.05$; ** $p < 0.001$.

TABLE 3 Independent t-test comparing self-reported self-efficacy between waves 2 and 3

I feel confident that I can...	Wave 2 (n = 1258) (n)%	Wave 3 (n = 477) (n)%	Significance
Stay home when I feel sick	Yes (947) 75.9	Yes (404) 86.9	**p < 0.001
	No (300) 24.1	No (61) 13.1	
Wash my hands regularly/use hand sanitizer when out in public	Yes (934) 75.1	Yes (394) 86.6	**p < 0.001
	No (310) 24.9	No (61) 13.4	
Use a mask or facial covering when in public	Yes (636) 51.6	Yes (394) 85.5	**p < 0.001
	No (597) 48.4	No (67) 14.5	
Keep a physical distance when in public or crowded spaces	Yes (853) 68.6	Yes (379) 82.2	**p < 0.001
	No (391) 31.4	No (82) 17.8	
Keep myself safe from COVID-19 disease	Yes (775) 62.5	Yes (352) 77.4	**p < 0.001
	No (465) 37.5	No (103) 22.6	

Note: Missing cases not included/imputed, valid total percentage of responses reported.

*p < 0.05; **p < 0.001.

protecting oneself from COVID-19 disease. It is not clear whether the individuals' perception of risk and self-efficacy were influenced by their individual circumstances or by the public health messaging surrounding these specific risk factors.

On a positive note, self-efficacy was higher in the later wave of the study indicating that confidence in prevention behaviors and confidence in being able to protect oneself from COVID-19 disease. This study has provided a two-wave perspective on a COVID-19 disease vulnerable community of self-efficacy over time. Self-efficacy is an important predictor of health behavior and ultimately health outcomes, such as morbidity and mortality.

Gaynor and Wilson (2020) posed the question

What can be gleaned, as early lessons, from a better understanding of the trends highlighted? What seems clear is that the maintenance of status quo administration allows for racially disparate outcomes. As long as administrators operate with a business-as-usual approach, these racialized disparities will continue.

Although our study did not find anything particularly surprising given the consistent pattern of disparities, what is important is how consistent patterns of vulnerability are, across states, across populations, in rural and urban areas. Consistent with previous literature Hispanic and Latino populations in the US report lower self-efficacy than non-Hispanic/Latino populations during disasters (Rivera, 2022). Social vulnerabilities are complex and compounding and deserve our continued collective attention. Studies like this, are continued calls for attention, in terms of addressing vulnerable populations in public health in general, but also during emergencies/disasters. Scholars such as Schunk and DiBenedetto (2021) posit that self-efficacy as a construct should continue to be explored in terms of diversity, cultural considerations, and the difference between collective versus individual self-efficacy. This study utilized the classic application of self-efficacy but further investigation of the social and cultural contexts of the construct in this population could assist in further understanding the complexity of this issue.

Self-efficacy is an important factor in gauging a population's confidence in protecting themselves, in this case from a novel disease. Previous population-level surveillance on self-efficacy has highlighted the significant role of

self-efficacy in physical and mental health outcomes. Interventions targeting groups identified with lower self-efficacy can improve population levels of self-efficacy and community resilience (PFG Analytics, 2019). The results of this study provided information during the active pandemic period. Given the findings of this study, there are implications that the socially vulnerable groups identified herein should be followed up with during the recovery and mitigation phases of the pandemic.

This study has provided insight into levels of self-efficacy among a vulnerable population during COVID-19 disease. In addition, it demonstrated that while self-efficacy did improve over time, socially vulnerable groups had consistently lower levels of self-efficacy in prevention behaviors. Further research should be conducted to determine how to improve self-efficacy among these groups to increase overall community self-efficacy and resilience.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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PEER REVIEW

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