

# Health-related quality of life during stay-at-home order and attitudes toward vaccination against COVID-19 in the District of Columbia, USA

Phronie JACKSON<sup>1</sup>, Collette BROWN<sup>2</sup>, Latoya CALLENDER<sup>1,2</sup>

*Affiliations:*

<sup>1</sup> Ph.D. Assistant Professor, University of the District of Columbia, College of Agriculture, Urban Sustainability and Environmental Sciences, Health Nursing, and Nutrition Department. Health Education/Public Health Program. Coordinator Washington, USA

<sup>2</sup> Ph.D. Professor, Monroe College, School of Allied Health Professions, Bronx, NY, USA.

*Corresponding author:*

Phronie Jackson, Ph.D., Assistant Professor, University of the District of Columbia College of Agriculture, Urban Sustainability and Environmental Sciences Health Nursing, and Nutrition Department Health Education/Public Health Program Coordinator Washington, USA. 4250 Connecticut Avenue, NW, Building 71 Room 5232, Washington, DC 20008. E-mail: phronie.jackson@udc.edu

## Abstract

**Introduction:** A spike in the cases of coronavirus (COVID-19) across the District of Columbia (DC) area has caused the mayor to issue a stay-at-home order between April 1, 2020 – May 15, 2020 to mitigate its transmission. The purpose of this study was to examine health related quality of life (HRQoL) during the stay-at-home order resulting from the COVID-19 pandemic and attitude towards vaccination against COVID-19 of residents living in Washington, DC's Ward 5 neighborhood.

**Methods:** A cross-sectional design to collect electronic data on experiences and perceptions of 102 adults living in Ward 5 of DC was used. An ad hoc 28-question survey was developed. Descriptive analyses (frequency and percentages) were conducted. Data was collected using Qualtrics, then exported to Statistical Package for the Social Sciences (SPSS), version 25.

**Results:** One hundred and two ( $N = 102$ ) residents participated in the study. Most of the participants were female (79.4%), between 37 and 58 years old (47%), black (79%), had a graduate degree (38.24%), and earned over \$75,000 (37.25%) annually. Results indicated that 20% of households received food from charitable organizations, while 27% worried that their food might run out. Approximately 19% were unable to receive dental services, 17.8% and 15.7% reported mental health and emotional impacts respectively, and 13.4% reported educational disruptions. Approximately 47% responded that they will take the COVID-19 vaccine. Most (77%) of the participants perceived that their overall health was good/very good.

**Discussion and Conclusion:** Based on continued increase in COVID-19 cases across the United States, residents might return to previous restrictions and negative impacts might be greater on residents. Lessons learned from this study can be used to create policies and programs that limit the negative impacts of COVID-19 and increase attitudes toward vaccination uptake.

**KEY WORDS:** Coronavirus; Washington, DC; Health-related Quality of Life; mental health; restrictions; survey; vaccine.

## INTRODUCTION

On January 30, 2020, the World Health Organization (WHO) announced that severe acute respiratory syndrome coronavirus (SARS-CoV-2), the virus that causes COVID-19 was a public health emergency [1]. Although much was not known about the virus (in its early stage), public health officials knew that the virus had a long incubation period, was highly infectious, and that there were no vaccines or antivirals to combat the disease [2]. On March 7, 2020, the first case of COVID-19 was diagnosed in the District of Columbia (DC), and by March 31<sup>st</sup>, there were a total of 586 diagnosed cases and 11 deaths [3].

As a result of the increased incidence rate, the Mayor of DC mandated a stay-at-home order (Mayor Order 2020-054) that went into effect on April 1, 2020 at 12:01 AM, as a strategy to reduce the incidence of infections [4]. The order was originally set to end on April 24, 2020 but was extended to May 29, 2020 [5]. The order specified that residents should only leave home to engage in essential activities, including obtaining medical care that cannot be provided through telehealth and

obtaining food and essential household goods; perform or access essential governmental functions; work at essential businesses; engage in essential travel; or engage in allowable recreational activities, as defined by the Mayor's Order [5]. Violators of the order risked being charged for a misdemeanor, which could have resulted with a fine and/or imprisonment [6]. Most of Ward 5 is in the northeast region on of Washington. According to the U.S. Census Bureau (2018), Ward 5 has 87,850 residents, a median age of 35.4, a median household income of \$68,375, and approximately 34% of residents use public transportation to get to work [7]. Although the stay-at-home order curtailed the spread of the virus [8], it interrupted work and school schedules, impacted the ability to receive food and healthcare services, and overall emotional, physical, and psychological health [9, 10]. Despite numerous public health campaigns, daily press briefings and news media that informed the public to wear face masks, practice social distancing, wash their hands frequently, new cases and deaths continue to increase. Despite the antivaccination movement and de-

### TAKE-HOME MESSAGE

*COVID-19 stay-at-home restrictions have many negative social and health impacts of residents in Ward 5. Addressing the determinants that lead to these restrictions are important to reduce COVID-19 incidence and improve their HRQoL. Uptake of vaccines may provide a promising option.*

**Competing interests** - none declared.

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bate among scientist between pros and cons, it seems likely that vaccinations might be an additional possible solution to mitigate the virus. Therefore, this study assessed the HR-QoL and attitudes towards vaccination because of the stay-at-home order due to the COVID-19 pandemic of residents living in Washington, DC's Ward 5 neighborhood.

## METHODS

### *Study Design and procedure*

The study utilized a cross-sectional design to collect electronic data on experiences and perceptions of adults who live in Ward 5 of DC. The survey collected data on Ward 5 residents' lived experiences during the COVID-19 pandemic initial restrictions, their perceptions of their health-related quality of life, as well as the likelihood of taking a COVID-19 vaccine. The survey was created electronically using Qualtrics. A link was generated after making the survey.

### *Study participants and sampling*

Study consisted of 102 adult residents (18 years and older) of Ward 5, DC. The researchers used convenience sampling to collect data from the participants. The participants are not representative of Ward 5 residents and the DC area because data were difficult to obtain due to the stay-at-home restrictions. In addition, the link was posted on social media (Facebook), and potential participants were sent the link via email or text messages and were asked to send the link to other eligible members of Ward 5.

### *Study instruments and measures*

Participants completed a 28-question survey, which consisted of socio-demographic questions and questions pertaining to their experiences and perceptions surrounding COVID-19 restrictions. The questionnaire consisted of four major sections: a) demographic information of the participants; b) experiences of participants during the stay-at-home COVID-19 restrictions; c) questions regarding their perceptions on their health-related quality of life;

and d) uptake of the COVID-19 vaccine.

The demographic questions were obtained from Harrison et al. [11], while the CDC's HRQL-4 instrument was used to collect data on self-rated general health and number of healthy days when a person was physically or mentally unhealthy or was limited in conducting usual activities within the last 30 days [12]. All the study variables were measured using descriptive statistics.

Demographic questions contain information on gender, age, race/ethnicity, education, and income. HRQoL refers to perceived physical and mental health over time [12]. Perception questions focused on health-related quality of life (physical, mental health, emotional health, and overall health). One question asked about the attitudes regarding COVID-19 vaccine uptake. Responses ranged from *yes*, *yes, but with some conditions*, *not sure*, and *no*. Questions on participants' experiences focused on personal experiences (ability to receive medical services, and family experiences (ability to receive food).

### *Ethical aspects*

This research was approved by University of the District of Columbia (IRB No: 1617781-2). Participants were provided with an electronic informed consent, which was attached at the beginning of the survey. After reading the informed consent, participants had the option to take the survey. Data were collected anonymously from each participant.

### *Data analysis*

Data was collected in Qualtrics and then exported to Microsoft Excel spreadsheet. Data was analyzed using Microsoft Excel. Categorical variables were presented in numbers and percentages.

## RESULTS

### *Socio-demographics characteristics of participants*

One hundred and two ( $n = 102$ ) residents participated in the study. All the participants lived in Ward 5. Most of the participants were

female ( $n = 81, 79.4\%$ ); were between 37 and 58 years old ( $n = 48, 47\%$ ); were black ( $n = 80, 79\%$ ); had a graduate degree ( $n = 39, 38.24\%$ ); and earned over \$75,000 ( $n = 38, 37.25\%$ ) in annual income (Table 1).

### *Participants' experience*

The past month before the participants took the survey, they were asked to check one or more ways in which they negatively impacted by COVID-19 (Table 2). Of the 108 responses, participants reported that their family/home life ( $n = 32, 14.7\%$ ), sense of well-being ( $n = 29, 13.4\%$ ), and their children/their education ( $n = 27, 12.4\%$ ) were negatively impacted by COVID-19. Approximately 19% of participants were unable to receive dental service ( $n = 21, 19.4\%$ ).

Table 3 highlights the household experiences of the participants because of COVID-19. Approximately 27% worried that their food might run out before they get money to buy more; and approximately one in every five households received food from charitable organizations.

Table 4 describes the health-related quality of life of the participants. Ninety-seven participants (95%) reported that their physical health was not impacted; 18 (17.8%) were mentally impacted; while 16 (15.7%) reported that they were unable to perform usual daily activities. Despite the effects of the pandemic, 77% of the participants perceived that their overall health was good/very good.

### *Participants' perceptions*

Table 4 summarizes the participants' attitudes toward taking the COVID-19 vaccines. Less than half (46.6%) responded that they were willing to take the vaccine.

## **DISCUSSION AND CONCLUSION**

This study focused solely on adults residing in Washington, DC's Ward 5 community. The study participants confirmed what has been reported in the literature regarding experiences related to food insecurity [13] education [14] dental services [15] and perceptions around health-related quality of health [16]

during the stay-at-home COVID-19 restrictions. However, this study results are contrary to Reiter, Pennell, & Katz [17] study findings on future vaccine uptake among adults.

### *Findings on experiences*

The results of the surveys indicated that 27% of the study participants experienced food insecurity during the COVID-19 restrictions and needed to obtain food from charitable organizations. They were worried about running out of food. Data from this survey, supports the Capital Area Food Bank's (CAFB) Hunger Report 2020 [18]. The report suggests there is a substantial increase in food insecurity in the wake of COVID-19 [19]. Twelve percent of this study's respondents reported that the restrictions requiring schools to close and created the need for home schooling caused issues for not only children, but also for parents. According to CANVAS, (2020) [20], 38% of the parents that they surveyed indicated that they experienced challenges managing their work/daytime obligations and their child(ren)'s schooling [21]. Accessing needed health services during the COVID-19 restriction was a negative experience for many of the respondents. Dental services were reported by 19% of the respondents. It was the health service indicated most frequently by the respondents as not available during the restrictions. Unlike most routine medical visits that can be done using television/video formats, most general dental procedures cannot be done virtually [22]. and require in person visits. During those appointments, the patient's mouth must be exposed and open, therefore not protected by a face mask or covering. This protocol does not provide safeguards from droplets and the virus could be transmitted during a common dental procedure [23]. This contributed to the recommendation to close dental practices [24]. In lieu of the many negative experiences the study participants reported, 77% indicated that their overall health was good/very good.

### *Findings on perceptions*

The majority of the study participants' reported being impacted zero days relating to qua-

**Table 1.** Sociodemographic characteristics of participants ( $n = 102$ ).

Variables	Number (%)	Mean	SD
Gender			
Male	21 (20.59)	1.79	0.4
Female	81 (79.41)		
Age			
18 – 25	7 (6.86)	3.92	1.5
26 – 36	15 (14.71)		
37 – 47	15 (14.71)		
48 – 58	24 (23.53)		
59 – 69	24 (23.53)		
70+	17 (16.67)		
Race/Ethnicity			
Black	80 (78.43)	3.60	1.25
White	16 (15.69)		
Other	6 (5.88)		
Education			
High School or Less	7 (6.86)	5.28	1.86
Some College	22 (21.57)		
Associate Degree	7 (6.86)		
Bachelor's Degree	26 (25.49)		
Graduate Degree	39 (38.24)		
Income			
Less than \$ 25,000	15 (14.71)	6.47	2.66
\$ 25,000 - \$ 54,999	26 (25.49)		
\$ 55,000 - \$ 74,999	23 (22.55)		
\$ 75,000 or more	38 (37.25)		

**Table 2.** Personal experience of participants due to COVID-19 ( $n = 102$ ).

Over the past month	Number	Percentage	Over the past month	Number	Percentage
Negatively Impacted			Unable to Get Health Services		
Ability to get food	14	6.5	Addiction services	1	0.9
Ability to get health services	14	6.5	Aging services	1	0.9
Ability to get medications	6	2.8	Dentist	21	19.4
Family/Home Life	32	14.7	Disability services	2	1.8
Health insurance or benefits	1	0.5	Elective Surgery	4	3.6
Intimacy/Sex life	16	7.4	Home Health Care	1	0.9
Education	27	12.4	Mental Health Care	4	3.6
Emotional state	24	11.0	Primary Care	3	2.8
Sense of Safety at Home	6	2.8	Reproductive Health Care	4	3.6
Sense of well-being	29	13.4	Social Services	1	0.9
Work	18	8.3	Specialty Services	7	6.5
Not Impacted	20	9.2	Other	8	7.4
			None of these	51	47.2

**Table 3.** Household experience of participants due to COVID-19 ( $n = 102$ ).

	Number	Percentage
Worried about whether food will run out		
True	23	26.7
False	63	73.3
Food we bought did not last and we do not have money to get more		
True	8	9.3
False	78	90.7
Received food from charitable organizations		
Weekly	7	8.1
Twice a month	1	1.1
Once a month	12	13.9
Never	60	69.8
Didn't know service was available	6	7.0

**Table 4.** Health-related Quality of Life of participants ( $n = 102$ ).

	No. of Days	Percentage
No. of Days Impacted by Physical Health		
0	97	95.0
1-7	2	1.9
8-14	2	1.9
15-21	0	0.0
22-30	1	1.0
No. of Days Impacted by Mental Health		
0	84	82.4
1-7	7	6.9
8-14	2	1.9
15-21	4	3.9
22-30	5	4.9
No. of Days Unable to Do Usual Activities		
0	86	84.3
1-7	5	4.9
8-14	5	4.9
15-21	1	1.0
22-30	5	4.9
Self-Reported Health Status		
	No. of Participants	Percentage
Very Poor	0	0.0
Somewhat Poor	2	2.3
Average	17	19.8
Somewhat Good	30	34.9
Very Good	37	43.0

**Table 5.** Attitudes Toward COVID-19 Vaccine Uptake ( $n = 102$ ).

	Number	Percentage
Willingness to take Vaccine		
Yes	14	16.3
Yes (with Conditions)	26	30.2
Not sure/May be	21	24.4
No	25	29.1

lity-of-life indicators such as, physical health, 95%, mental health, 82% and ability to do usual activities, 84% between April 1, 2020 to May 15, 2020 during the time that DC government imposed the COVID-19 restrictions. The respondents perceived that their mental health was adversely affected. This included their sense of well-being, 13% and emotional state, 11%. These results are in line with the findings of a recent Kaiser Family Foundation report, that suggests mental health is impaired by COVID-19 restrictions. The report indicated that based on the stay-at-home order, 47% of the respondents perceived stress and worry negatively impacted their mental health [25]. Seven percent of our study participants indicated that their mental health was affected 1 -7 days and 5% indicated between 22 - 30 days their mental health was affected. Swarbrick and Brown [26], describes the inability to carry out everyday function, as a characteristic of a mental illness or mental disorder. Five percent of this study's participants reported that between one to seven days, eight to 14 days and 22 - 30 days they were not unable to do usual activities. Like our study, Kim and Laurence [27] found that the COVID-19 restrictions are distressing on mental health. In lieu of the many negative experiences the study participants reported, 77% indicated that their overall health was good/very good. These responses might be overestimated because the data were collected in the infancy of the pandemic and many people might have been hopeful that new cases might decline, and normal life will resume.

#### *Attitude towards vaccination against COVID-19*

Uptake of a future COVID-19 vaccine

among this study's participants appeared varied. Responding with a resounding yes that they would take the vaccine were 16%. This is unlike Reiter et al. [17], where overall, 69% of participants were willing to get a COVID-19 vaccine. Those participants were more likely to be willing to get vaccinated if they thought their healthcare provider would recommend vaccination. In this study the respondents' willingness to take the vaccine was not influenced by their physician's recommendation to take the vaccine. This study's respondents stating yes (with Conditions) equaled 30% while 26% select not sure/maybe. These individuals might be convinced to get vaccinated for COVID-19. Finally, 29% of this study's participants responded with a flat no to be willing to take the vaccine. Some of the comments relating to not taking the vaccine were: "I don't trust the CDC", "I don't trust the government", "I don't trust it". These results and those of a recent Pew Research Center study about a COVID-19 vaccine indicates the public are divided when it comes to taking the vaccine [28]. When we started this study there were not any developed and approved vaccines. In recent weeks three pharmaceutical companies have submitted vaccine to the FDA for approval [29].

#### *Study strengths and limitations*

Research involving human participants are understood to have limitations. A possible limitation of this study could be the small sample size. However, according to Eiko [30], a small sample size is neither good nor bad and all research informs the body of knowledge. Future research should include adult residents from all 8 wards of Washington, DC to determine if there are similarities in responses

to experiences and perceptions of stay-at-home COVID-19 restrictions and future vaccine uptake among adults. This research study examined the experiences and perceptions of stay-at-home COVID-19 restrictions had on adult residents of ward 5 in Washington, DC. We asked questions about experiences and perceptions, concerns, observations, views, interactions, and determinants to explore the HRQoL and vaccination attitudes of Ward 5 Adult Residents during the time when COVID-19 Pandemic restrictions were in place. This study provided some base line data for how the adult residents of ward 5 were impacted by the restrictions imposed due to the COVID-19 Pandemic. As restrictions are once again being instituted and vaccines and clinical trials are becoming available, there is a growing interest in understanding the experiences and perceptions of stay-at-home COVID-19 restrictions and future vaccine uptake among populations with similar demographic of the adults in Ward 5 of DC. The attitudes towards the vaccination could be affected by the stay-at-home order and the study period, it could indeed change in the future. The results of this current research will

assist us in making recommendations to policymakers on the types of programs for ward 5 residents that may reduce issue related to food insecurity, mental health, and education issues with particular emphasis on underserved communities. These interventions are likely to reduce the negative experiences and perceptions during future COVID-19 restrictions for residents of ward 5. The investigators of this current study conclude that this research adds to the understanding of the experiences and perceptions of stay-at-home COVID-19 restrictions and future vaccine uptake among adults in Ward 5 of DC.

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