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## COVID Mitigation Strategies and Safety Perceptions Among Workers During Spring 2020 Shutdown

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William McIver, Student

Dr. Erin Haynes, Committee Chair

Dr. Sarah Wackerbarth, Director of Graduate Studies

COVID Mitigation Strategies and Safety  
Perceptions Among Workers During Spring  
2020 Shutdown



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**Abstract:**

A novel coronavirus pandemic radically shifted the working environment of the population in the United States in the spring of 2020. Studies have examined the difference between healthcare workers and the general population, but there exists a gap when looking at mitigation strategies between healthcare workers and other workers that continued working outside the home. This study surveyed workers and asked about employment status, employment field, COVID safety precautions taken in the workplace, and feelings of safety. This study examined that and found statistically significant differences in the mitigation strategies used by healthcare workplaces and all other non-healthcare workplaces. This research shows that different professions (namely medical vs non-medical) had different approaches in regards of trying to protect workers from COVID-19. Future research is needed to further examine the relationship between mitigation strategies and perception of safety.

## **Introduction:**

In late winter of 2019-2020 cases of pneumonia of unknown cause emerged in the Hubei region of China. The causative agent was later identified as a member of the Coronaviridae family and named SARS-Cov-2 (more commonly known as COVID-19) (WHO, 2020). In the following weeks and months the virus spread rapidly around the world and was declared a global pandemic. It is believed that the first case was identified in the United States in Washington state on January 20th, 2020 although the possibility of there being unidentified cases exists: from here the virus spread across the United States (Holshue et al, 2020.) On March 19th California became the first state to issue stay at home orders and several states in the following days and weeks followed suit beginning the Spring 2020 Shutdown (American Journal of Managed Care Staff, 2021.) During this shutdown there existed a category of essential workers that needed to continue working outside of the home, these include: agriculture, food service, grocery, some retail, healthcare, first responders, public works, manufacturing, public transportation, public utilities, construction, information technology, and K-12 teachers (CISA, 2020.) For these workers CDC recommended several protection and mitigation strategies which include: use of masks, use of gloves, frequent use of hand sanitizer/hand washing, use of a protective shield, enforced social distancing of 6ft, limit number of people in building, for sales using only credit cards and not cash, and education about safety measures (CDC, 2021.)

Studies in Italy and Portugal have compared risk perception between healthcare workers and the general population in terms of becoming infected with COVID-19, however neither of these studies looked specially at what mitigation strategies each location was using and how it might differ between healthcare workers and other works as well as risk perception (Simone et al, 2020)(Peres et al, 2020.) As such, there is a gap in the literature when looking at that relationship between risk perception and mitigation strategies. The Italian study found that

healthcare workers were 2.5 times more likely than the general population to perceive themselves as at risk of infection (Simone et al, 2020.) Meanwhile the Portuguese study found that 54.9% of healthcare workers believed there was a high probability of becoming infected compared to 24% of the general population (Peres et al, 2020).

This study will aim to explore the relationship between risk perception of healthcare workers as well as mitigation strategies implemented within the workplace and if there is a significant difference between the strategies used by healthcare workers compared to non-healthcare workers.

## **Methods:**

A survey was developed that asked participants about working status, health issues, mental health issues, and disruption of life due to COVID-19. This survey was then given to existing study populations in the Appalachian region. Participants were encouraged to share the survey link with friends and family, often through social media, in order to achieve snowball sampling. The survey was administered from May 8th, 2020 to June 6th, 2020 (Haynes et al, 2021). For this study, 2 primary categories of workers were made: healthcare workers and all other workers working outside the home. The main variables of interest between these groups will be the mitigation strategies implemented in the workplace and perceived level of safety from COVID-19 infection. All figures and significance tests were conducted with SAS 9.4 and all statistical tests with a significance level of 0.05.

## Results:

Overall, the survey was completed by 751 individuals of which 186 identified as working outside the home and of those 186, 136 identified as working outside the home as an essential worker. Furthermore, 74 identified as being a healthcare worker. Table 1 shows demographics.

<b>Total Population, N=186</b>	<b>Total, N(%)</b>	<b>Healthcare worker, n(%)</b>	<b>Non-Healthcare worker, n (%)</b>
<b>Age, n=x</b>			
18-34	21 (15.91)	6 (8.45)	15 (24.59)
35-44	43 (32.58)	32 (45.07)	11 (18.03)
45-64	67 (50.76)	32 (45.07)	35 (57.38)
65 and older	1 (0.76)	1 (1.41)	0 (0)
<b>Gender, Female</b>	<b>87 (67.44)</b>	<b>63 (91.3)</b>	<b>24 (40)</b>
<b>Race, Caucasian</b>	<b>119 (95.20)</b>	<b>65 (92.86)</b>	<b>54 (98.18)</b>
<b>Income</b>			
<\$50,000	17 (14.53)	9 (14.29)	8 (14.81)
\$50,000 - \$99,999	44 (37.61)	22 (34.92)	22 (40.74)
≥\$100,000	56 (47.81)	32 (50.79)	24 (44.44)
<b>Type of Work</b>			
Agriculture/Farming	2 (1.08)		
Restaurant	6 (3.23)		
Grocery	1 (0.54)		
Retail	3 (1.61)		
Healthcare	74 (39.78)		
First Responders	6 (3.23)		
Public Works	3 (1.61)		
Manufacturing	21 (11.29)		
Public Transit	1 (0.54)		
Public Utilities	2 (1.08)		
Construction	6 (3.23)		
Information Technology	3 (1.61)		
K-12	8 (4.30)		
Other*	50 (26.88)		
<b>Risk Factors, N=136</b>			
Moderate to severe asthma	11 (8.09)	5 (6.76)	6 (9.68)
Chronic Lung Disease	6 (4.41)	3 (4.05)	3 (4.84)
Diabetes	5 (3.68)	1 (1.35)	4 (6.45)



Obesity	33 (24.26)	20 (27.03)	13 (20.97)
Cardiovascular Disease	5 (3.68)	2 (2.70)	3 (4.84)
Aged 65 or older	1 (0.74)	1 (1.35)	0 (0)
Immunocompromised	5 (3.68)	4 (5.41)	1 (1.61)
Chronic Kidney Disease	1 (0.74)	1 (1.35)	0 (0)
Chronic Liver Disease	0 (0)	0 (0)	0 (0)

\*Other was other respondents that reported working that did not fit into essential worker criteria.

Table 1. Characteristics of study population of workers during the Spring 2020 Shutdown

For mitigation strategies, 181 of the 186 respondents reported that their employer provided or implemented some sort of mitigation strategy in the workplace, the most frequent three in order being use of hand sanitizer, masks, and education about safety. The below table displays the usage of mitigation strategies, as well as the p-value produced by a chi-squared test looking at the difference between healthcare and non-healthcare workers.

Table 2. Employer Provided or Implemented Strategies.

Mitigation Strategy, N=186	Provided, n(%)	Healthcare worker	Non-healthcare	P value
Mask	136 (73.12)	66 (89.19)	43 (69.35)	0.0039
Gloves	100 (53.76)	55 (74.32)	27 (43.55)	0.0003
Hand Sanitizer	148 (79.57)	59 (79.73)	50 (80.65)	0.8939
Protective Shield	40 (21.51)	28 (37.84)	9 (14.52)	0.0023
Enforced Social Distancing	113 (60.75)	44 (59.46)	41 (66.13)	0.4236
Limit Number of People in Building	129 (69.35)	50 (67.57)	45 (72.58)	0.5258
Use of Credit Card Only (No Cash)	12 (6.45)	6 (8.11)	4 (6.45)	0.7124
Education About Safety	130 (69.89)	60 (81.08)	40 (64.52)	0.0292
None of the Above	5 (2.69)	2 (2.70)	1 (1.61)	0.6665

Participants were asked about how safe they felt in the workplace given the measures taken by their employer. Overall, 52% of respondents felt “Very Safe”, and this breaks down to 54.8% of healthcare workers feeling very safe and 46.7% of non-healthcare workers feeling very safe. Table 3 shows all levels of feelings of safety, as well as a comparison between healthcare

workers and non-healthcare workers in feeling very safe vs all other safety categories with a chi-square test for significance.

Table 3. Employee Perception of Safety based on provided precautions.

<b>Feeling of Safety, N=183</b>	<b>Count, n(%)</b>	<b>Healthcare Worker</b>	<b>Non-healthcare</b>
Very Safe	96 (52.46)	40 (54.79)	29 (46.77)
Somewhat Safe	70 (38.25)	28 (38.36)	23 (37.10)
Not at all safe	10 (5.46)	3 (4.11)	6 (9.68)
Unsure	6 (3.28)	2 (2.74)	4 (6.45)
Employer did not provide precautions	1 (0.55)		

Table 4. Employee Perception of Very Safe vs Not Very Safe with Chi-Square Test

<b>Feeling of Safety, N=135</b>	<b>Total, N(%)</b>	<b>Healthcare Worker</b>	<b>Non-healthcare</b>	<b>p=0.35</b>
Very Safe	69 (51.11)	40 (54.79)	29 (46.77)	
Not Very Safe	66 (48.89)	33 (45.21)	33 (53.23)	

## **Discussion:**

This study found statistically significant differences in mitigation strategies implemented in the workplaces of healthcare workers vs non-healthcare workers that continued working outside the home during the Spring 2020 COVID Shutdown. However, there was no statistically significant difference between healthcare workers vs non-healthcare workers in perception of safety.

Studies such as Simione et al and Peres et al looked at feelings of safety but not protection measures. Wahed et al explored the concerns of healthcare workers while Kuang et al explored the concerns of a general population. Generally, these studies dived into risk perception and concerns, but did very little to example how these groups were engaging in protecting themselves, as such this remains an area to be studied. This study aimed to fill a gap in the literature comparing the mitigation strategies of healthcare workers to non-healthcare workers that continued working outside the home in spring of 2020.

This study shows that medical settings implemented more mitigation strategies compared to non-medical settings, which makes sense given the work setting offering a potential of increased risk compared to other work fields. The difference in feelings of safety warrants further study, both generally and within this cohort.

It is worth noting that around the time of the start of the study, the recommendation of use of cloth masks by the public was still being developed and there was a strong culture of preservation of masks and other PPE supplies for healthcare workers (Jacobs, 2020). As such this could affect what PPE was available for employers to use/provide. As the survey period extended into June those later responses could capture some of the shift in norms and practices.

Also worthy of discussion is the education component of safety. This survey did not assess type or quality of education provided to these workers. However, education was a cost-effective and cheap measure that any employer would be able to provide (Lahiri, 2005). Future research could examine quality of workplaces messaging about safety. It would also be useful to know if this education including training on proper usage of other methods (such as handwashing techniques, making sure a mask covers the nose, etc.)

Limitations on this study include that it was done via a convenience sample and thus may not be truly representative of the working population. The relatively small sample size is also a minor limitation. However, a large strength of this study is that this type of survey cannot accurately be recreated. Future studies that examine perceptions of safety would likely suffer from recall bias and hindsight from respondents, this survey captured people as they were working and living in that environment and thus it is strong primary data.

Future research that could build upon this study could examine safety perceptions surrounding COVID vaccination, especially if the same study cohort could be followed up with in order to compare the results from the two surveys of the same sample population. The same research could also compare this perception of safety to self-reported COVID infections within the study population. Comparing mitigation strategies used to feelings of safety could yield further significant results.

Overall, this study demonstrates that there are differences in workplace practices in regards to protecting workers from COVID-19, specifically between healthcare workers and all other categories of worker. It is unclear if there are significant differences in COVID-19 risk perception between these two categories of workers and further research is required to clarify any type of relationship.

Table 5. Literature review

Author	Year	Title	Aims	Method	Sample	Conclusion	Comments
Simione	2020	Differences Between Health Workers and General Population in Risk Perception, Behaviors, and Psychological Distress Related to COVID-19 Spread in Italy	Perception of risk of contracting COVID between healthcare workers and the general population	Convenience sample	353	Health workers reported higher risk perception, level of worry, and knowledge as related to COVID-19 infection compared to the general population.	Shows a similar relationship however uses the general population for comparison rather than a different group of workers.
Peres	2020	Risk perception of COVID-19 among Portuguese healthcare professionals and the general population	Risk perception assessment of COVID-19 among Portuguese Healthcare Professionals and the general population	Snowball convenience sample	3403	54.9% of HCPs believed there was a high probability of becoming infected, in contrast with 24.0% of the GPop	Similar to the Italian study but larger, also included sections about risk of family infection.
Wahed	2020	Assessment of Knowledge, Attitudes, and Perception of Health Care Workers Regarding COVID-19, A Cross-Sectional Study from Egypt	This study aimed to assess the knowledge, perception, and attitude of the Egyptian HCWs towards the COVID-19 disease.	Self-administered questionnaire	407	About 83.1% of participants reported being afraid of contracting COVID-19, and 89.2% believed they were at a higher risk of infection as compared to others.	Specifically looked at beliefs among healthcare workers with no comparison to other groups.
Kuang	2020	Awareness, Risk	Examined people's	Phone call survey	2044	60% reported no	Vice Versa of the

		Perception, and Stress during the COVID-19 Pandemic in Communities of Tamil Nadu, India	awareness of COVID-19 symptoms, risk perception, and changes in behaviors and stress levels during the lockdown in peri-urban Tamil Nadu India.			fear of contracting the virus, 26% reported low risk of contraction. Many economic concerns.	Egyptian study, looked solely at the general population.
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