
Original Article

Understanding the Impacts of the COVID-19 Pandemic on Small Businesses and Workers Using Quantitative and Qualitative Methods

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Abstract

The COVID-19 pandemic has simultaneously exacerbated and elucidated inequities in resource distribution for small businesses across the United States in terms of worker health and the financial stability of both owners and employees. This disparity was further intensified by the constantly changing and sometimes opposing health and safety guidelines and recommendations to businesses from the local, state, and federal government agencies. To better understand how the pandemic has impacted small businesses, a cross-sectional survey was administered to owners, managers, and workers ($n = 45$) in the beauty and auto shop sectors from Southern Arizona. The survey identified barriers to safe operation that these businesses faced during the pandemic, illuminated worker concerns about COVID-19, and elicited perceptions of how workplaces have changed since the novel coronavirus outbreak of 2019. A combination of open-ended and close-ended questions explored how businesses adapted to the moving target of pandemic safety recommendations, as well as how the pandemic affected businesses and workers more generally. Almost all the beauty salons surveyed had to close their doors (22/25), either temporarily or permanently, due to COVID-19, while most of the auto repair shops were able to stay open (13/20). Beauty salons were more likely to implement exposure controls meant to limit transmission with customers and coworkers, such as wearing face masks and disallowing walk-ins, and were also more likely to be affected by pandemic-related issues, such as reduced client load and sourcing difficulties. Auto shops, designated by the

What's important about this paper?

This study of small businesses—salons and automobile repair shops—used the social-ecological framework to understand responses to the COVID-19 pandemic. Concerns identified were both financial and health related, such as can be mitigated through sustained educational outreach and financial support in future pandemics. This study contributes to the groundwork for future studies and community engagement that will help businesses and policymakers develop and strengthen healthy and safe work practices.

state of Arizona to be 'essential' businesses, were less likely to have experienced financial precarity due to the pandemic. Content analysis of open-ended questions using the social-ecological model documented current and future worker concerns, namely financial hardships from lockdowns and the long-term viability of their business, unwillingness of employees to return to work, uncertainty regarding the progression of the pandemic, conflict over suitable health and safety protocols, and personal or family health and well-being (including anxiety and/or stress). Findings from the survey indicate that small businesses did not have clear guidance from policymakers during the pandemic and that the enacted regulations and guidelines focused on either health and safety or finances, but rarely both. Businesses often improvised and made potentially life-changing decisions with little to no support. This analysis can be used to inform future pandemic preparedness plans for small businesses that are cost-efficient, effective at reducing environmental exposures, and ultimately more likely to be implemented by the workers.

Keywords: COVID-19 pandemic; small business; cross-sectional survey; occupational health and safety; community-engaged research; social-ecological model; environmental exposures

Introduction

The COVID-19 pandemic has simultaneously exacerbated and elucidated inequities in resource distribution for small businesses, with pronounced effects on the health and financial stability of both owners and employees. Small businesses tend to employ people of low socioeconomic status (SES), including minority and immigrant workers (Acs and Nichols, 2007), who have experienced a disproportionate rate of COVID-19 morbidity and mortality throughout the pandemic (Tai *et al.*, 2020). Latino populations in Arizona faced a roughly two-fold risk of catching COVID-19 paired with a 14–24% increased risk of death when compared to non-Hispanic whites (Shen *et al.*, 2021). With a Latino/Hispanic population of approximately 44%, these discrepancies are particularly relevant for Tucson, Arizona residents (U.S. Census Bureau, 2021). This is in conjunction with pre-pandemic health disparities associated with other environmental and occupational exposures that cause inflated rates of illness and disease for workers with lower SES (Okun *et al.*, 2001; Brunette, 2005).

Small businesses, which are generally considered those with fewer than 100 employees, are also particularly vulnerable to economic uncertainty (Lussier, 1996). The disruptions that occurred beginning in 2020 across the United States as a result of shelter-in-place orders

and social distancing recommendations put forth by local, state, and federal governments created enormous financial burdens for small business owners, most of whom were ill-prepared for interruptions as abrupt and long-lasting as a pandemic. This occurred concurrently with the need to increase spending for personal protective equipment (PPE) and disinfection products, while efforts to secure both PPE and normal industry supplies were hampered by global supply chain issues. Businesses were forced to weigh the competing risks from possible workplace exposures to SARS-CoV-2 against the subsequent loss of income from public health measures meant to minimize viral transmission, such as reducing client load or temporarily closing. We conducted a survey of small businesses in Southern Arizona designed to explore how specific challenges were intensified during the pandemic and to identify strategies that have the potential to increase workplace safety in the long-term.

Challenges for Small Businesses

General challenges for small businesses may include the inability to afford health insurance for workers, the cost of engineering controls to eliminate or minimize workplace hazards, the fees and time commitments of employee training, and expensive PPE (Black *et al.*, 1993, 1999; Moutray, 2009; NIOSH, 2015a; Feinmann, 2020).

With limited funds available for management, there is often less oversight of the individual worker, who may inadvertently cut safety corners to meet productivity demands, which in turn may normalize unsafe habits that can permeate the workplace (Lundell and Marcham, 2018). Finally, small businesses are less likely to consult with industrial hygienists or government agencies (Pedersen and Sieber, 1998; Okun *et al.*, 2001) due to high costs and the sometimes-distrustful attitude toward government or unions (Azaroff *et al.*, 2011). It may also stem from a lack of access to the chronically understaffed and underfunded regulatory agencies (Rachleff, 2021), as well as inadequate knowledge on when and how to contact these organizations on behalf of their business and workers (Schneider *et al.*, 2004; Sinclair *et al.*, 2013). Finally, some small business owners lack the scientific training needed to access and interpret the relevant data (Okun *et al.*, 2001; Brunette, 2005; Sinclair *et al.*, 2013) or to identify valid sources of information.

These issues were more pronounced for small businesses during the COVID-19 pandemic because they tended to lack the financial or material resources, the business framework, and the legal capacity to rapidly modify their workplace in a way that would meet all the requirements for safe and healthy operation during a pandemic (Fairlie, 2020). This was further intensified by the constantly changing and sometimes opposing health and safety guidelines and recommendations coming from various government sources. Not only were the relevant data gradually being gathered synchronously with the immediate need for decision-making and policy development, but personal politics also played a role in the adoption and dissemination of chosen guidelines by state and local agents.

In terms of COVID-19, small businesses throughout the USA were overwhelmed by the concurrent stressors. Many were forced to either temporarily or permanently close their doors (Fairlie, 2020). Owners, managers, and workers had to make significant and potentially life-altering decisions without all pertinent information at their disposal. For example, businesses had to balance the nebulous odds of virus transmission against the increased health risks associated with the use of volatile cleaning disinfectants, often amid societal pressure to over-sanitize to assuage fears. Again, this unequivocally affected Latino workers because of their high employment rates in the small business sectors that provide in-person services to the public (Fischer, 2008; Noe-Bustamante *et al.*, 2021).

Safety culture in small businesses

One way that businesses can provide healthy workplaces is to foster a culture of safety, defined as ‘the attitudes,

beliefs, perceptions and values that employees share in relation to safety’ (Chib and Kanetkar, 2014). Safety culture involves creating norms and policies that emphasize safety as a priority and purveying them to each worker through managerial reiteration.

One aspect of safety culture is to recognize and address the numerous interconnected influences on an individual’s actions. The social-ecological model (SEM) recognizes that health and safety behavior is constantly affected and modified by one’s surroundings (Kilanowski, 2017). The SEM takes a tiered approach, with the innermost level being an individual’s own beliefs and actions. This is followed by interpersonal influences, including interactions with family, peers, coworkers, and even customers who can directly affect an individual’s ideologies and conduct. The next level of influence is organizational, which promotes and/or enforces practices and work environments that enhance safety and wellness. Community is the subsequent level, in which the interplay of all the establishments within an environmental and social context are coalesced. The final level is policy, which impacts the activities of each of the previous levels (Lee *et al.*, 2017). The SEM is widely applied to develop and promote health interventions in a broad range of settings (McCloskey *et al.*, 2011; Kilanowski, 2017). Our group previously used the SEM to conceptualize how to ensure the health and safety of low-wage workers in small businesses (Ingram *et al.*, 2021).

Another common and valuable way of evaluating safety in the workplace is through the National Institute for Occupational Safety and Health (NIOSH) Hierarchy of Controls (HoC). The HoC also takes a layered approach toward worker health and safety, ideally moving from most to least effective, starting with the goal of complete elimination of the hazard and concluding with individual protections. The level most reliant on the individual is the use of PPE. This layer necessitates regular and accurate use of the equipment, assuming it is always readily available. The HoC then offers administrative controls, with the goal of minimizing exposures by modifying employee behaviors through rules or work processes. Engineering controls use the building to remove hazards from the work areas, such as HVAC, local exhaust systems, or air purifiers, instead of relying on error-prone people. Substitution, which replaces the hazards with something less hazardous, and elimination, which physically removes it from the workplace, are preferred to engineering controls. The HoC model is applied through standards and enforcements. This includes any overarching guidelines and regulations that are relevant (NIOSH, 2015b; Morris and Cannady, 2019). The two models are highly comparable in that they use a



Figure 1. The social-ecological model and hierarchy of controls.

larger societal framework to affect an individual (Fig. 1). Both emphasize the consequences that each layer has on the others below it and acknowledge that some levels are more effective or feasible than others.

This research uses the SEM and HoC to understand how small businesses have adapted to the previously outlined stressors from the COVID-19 pandemic. Survey questions were designed to explore the barriers that workers encountered, to ask about concerns workers had about COVID-19, and to find any gaps between small businesses and governmental or community organizations' resource distribution. This analysis will strengthen understanding of the impact of COVID-19 on the immediate needs of businesses while pushing for policy changes that support safer and more sustainable work environments. The goal of this study was to identify these factors and to better recognize and understand the role that each play on the health and economic security of small businesses and their staff.

Methods

A survey was implemented as part of a community-engaged research partnership between the University of Arizona, the Sonora Environmental Research Institute (SERI), and El Rio Health Center to address the health and safety of small business owners and workers in Southern Arizona. The survey included both qualitative and quantitative sections, allowing for a mixed method analysis of responses. This study, which was a supplement

to an ongoing parent study, sought to identify and develop needed resources to provide to local small businesses during the pandemic. This also allowed us to maintain contact with businesses that had participated in the assessment phase of the parent study, which was put on hold as small businesses responded to the pandemic.

Parent study

The parent study will evaluate a community health worker (CHW) intervention through a cluster-randomized trial aimed at reducing volatile organic compound (VOC) exposures in auto body shops and beauty salons in metropolitan Tucson, Arizona. VOCs can cause several negative health outcomes, such as respiratory irritation, neurological disease, reproductive disorders, or cancer ([Indoor Air Pollution: An Introduction for Health Professionals, 1995](#); [Soni *et al.*, 2018](#); [Fimbres *et al.*, 2021](#)). We had initiated business recruitment for this study when the pandemic began, which halted our research temporarily. By focusing on documenting challenges and barriers to these businesses during the pandemic, we hope to transfer our findings to other workplace hazards, including VOCs. Since recruitment for the parent study had recently been initiated before transitioning to the study presented here, there was no overlap in recruitment efforts.

Population

Beauty salons and auto repair shops were the focus of this survey because the parent study had conducted

previous research with these businesses prior to the pandemic regarding other workplace hazards. This simultaneously gave us deeper insight into these workplaces and allowed us to maintain and strengthen our ongoing relationships within these industries. It also helped us gain awareness into how other environmental exposures may have changed in response to the pandemic, such as through increased cleaning frequency or the use of stronger disinfectants.

Because beauty salon workers interface more directly with the public than auto repair workers, and because beauty salon workers are predominantly female while auto shop workers are primarily male (Data USA, 2021), responses were expected to vary between the two groups. Additionally, auto shops were designated early on in Arizona as an ‘essential business,’ while beauty salons were contentiously debated regarding their essential status (Arizona Board of Cosmetology, 2020; Office of the Arizona Governor, 2020; Polletta and Ruelas, 2020). Many clients were willing to postpone making appointments for beauty treatments, whereas vehicle repairs were less suitable for delays. These differences improve the likelihood that the responses represent a broad range of potential reactions from workers within these two business sectors.

Survey design

The survey had three sections: business practices, perceived risks, and impacts on businesses. Questions were adapted from several previous surveys developed to conceptualize risk from other settings and populations (Cabrera and Leckie, 2009) and from a validated survey created specifically to measure risk perceptions regarding COVID-19 (Conway III *et al.*, 2020). The questions focused on the choices that owners and workers made about modifying workplace practices during the pandemic, such as disinfection frequency or customer interactions, about barriers that they or their businesses faced, and about their worries regarding COVID-19 and the subsequent effects on business practices. The majority of responses were binary (yes/no or true/false), such as, ‘Did your shop close at any time since March 1, 2020 due to COVID-19 or anything related to it?’ Three open-ended questions were included in the survey to allow the participants to share information that may not have been covered by the close-ended questions. These questions asked about any other workplace barriers not previously mentioned, concerns the workers have about the coming year, and anything else they wanted to mention about how the pandemic has affected them or their workplace. The survey was available in English and Spanish.

Participants were recruited via social media, phone calls, mailed flyers, and poster advertisements. Phone calls were made to 656 businesses as direct outreach for recruitment, with 320 (48.8%) of the shops being in the beauty sector and 336 (51.2%) from the auto repair industry. Contact information for the businesses was compiled based on internet searches, social media presence, and driving through targeted neighborhoods looking for relevant storefronts. Surveys were either self-administered online ($n = 23$) or asked over the phone ($n = 22$) to owners, managers, and workers beginning in April 2021 through November 2021. Responses were de-identified prior to analysis.

Quantitative analysis

Inclusion criteria required that participants be adults (over 18 years old) who worked in Southern Arizona at a beauty salon or auto shop and were English- or Spanish-speaking. Responses were sorted by workplace, which were listed as beauty salon, auto shop, or ‘other.’ Those who selected ‘other’ as their type of work were categorized based on the description of their workplace as either beauty salon or auto shop. Although the survey has longitudinal components, this analysis considered only baseline responses as a means to identify and explore the similarities and differences between the reactions of beauty salon workers and auto repair workers. Data regarding previously implemented safety practices and pandemic-related barriers were then analyzed as one dataset to provide a more generalized look at small business health and safety practices.

Frequencies and percentages were used to describe categorical responses, and descriptive numerical summaries were used for questions that provided numerical values. Comparison of categorical responses between auto shops and beauty salons were evaluated using the Pearson Chi-Square Test of Independence. A P -value of less than 0.05 was considered statistically significant. Graphical displays were assessed to identify visual trends in ordered (categorical) outcomes.

Qualitative analysis

For each open-ended question, any participants with missing values, ‘N/A,’ ‘No,’ or equivalent responses for all three questions were excluded from the thematic analysis. Two researchers independently conducted a contextual analysis and categorized the comments into overarching themes. Each researcher grouped the responses based on similarity of content, created a description of the category, and then met to compare results and create final thematic classifications. Next, the researchers coded the comments to the matching levels of

the SEM. Responses that fit into multiple levels of the SEM were coded accordingly. Any discrepancies in the coding were discussed, and comments were recoded, if necessary. Finally, responses were further stratified into beauty salon or auto shop workers to determine if there were any noticeable differences between the two business types.

Results

The study yielded 45 completed surveys for analysis. Responses were nearly evenly split between the sectors, with 20 (44.4%) from auto repair shops or similar businesses, such as headlight repairs or boat maintenance, and 25 (55.6%) from beauty salons, such as hair salons, nail salons, and aesthetician offices (Table 1). The responses were well dispersed based on gender, with 25 (55.6%) females and 20 (44.4%) males, although there was a statistically significant difference in gender between the two shop types. Of the 45 respondents, 21 (46.7%) identified as Hispanic, Latino, or Spanish. The participants ranged from 21

to 71 years old, with a median age of 40.5 years. The shops had an average of about five employees (SD \pm 4.6), with the largest company employing 24 workers and the smallest being a single person. Three of the 45 surveys (6.7%) were completed in Spanish, with one of these three participants indicating Latino, Hispanic, or Spanish ethnicity. There were also significant differences in the level of education between the two shop types.

Quantitative findings

A vast majority of beauty salon workers stated that their shops closed either temporarily or permanently due to COVID-19 at 88% (22/25), while only 35% (7/20) of auto shops said the same. This is likely because auto shops were labeled 'essential' on March 23, 2020, by Governor Ducey's Executive Order 2020-12 (Ducey, 2020). Despite this large difference, beauty salon and auto shop workers reported similar percentages regarding their ability to get financial assistance for their businesses at 44% (11/25) and 40% (8/20), respectively (Table 2).

Table 1. Survey respondent background and demographic characteristics

	Overall (N = 45) n (%)	Auto Shops (N = 20) n (%)	Beauty Salons (N = 25) n (%)	χ^2 P-value
Employee type				
Employee	16 (35.6)	7 (35.0)	9 (36.0)	0.703
Manager	10 (22.2)	4 (20.0)	6 (24.0)	
Owner	17 (37.8)	9 (45.0)	8 (32.0)	
None of the above	1 (2.2)	0 (0.0)	1 (4.0)	
Preferred not to answer	1 (2.2)	0 (0.0)	1 (4.0)	
Gender				
Female	25 (55.6)	6 (30.0)	20 (80.0)	0.002*
Male	20 (44.4)	14 (70.0)	5 (20.0)	
Age				
18–39	19 (42.2)	6 (30.0)	13 (52.0)	0.618
40–59	15 (33.3)	7 (35.0)	8 (32.0)	
60+	8 (17.8)	6 (30.0)	2 (8.0)	
Preferred not to answer	3 (6.7)	1 (5.0)	2 (8.0)	
Highest level of education				
Completed high school	7 (15.6)	4 (20.0)	3 (12.0)	0.002*
Some trade school	1 (2.2)	1 (5.0)	0 (0.0)	
Completed trade school	15 (33.3)	1 (5.0)	14 (56.0)	
Some college	14 (31.1)	11 (55.0)	3 (12.0)	
Completed college or graduate school	8 (17.8)	3 (15.0)	5 (20.0)	
Ethnicity				
Hispanic, Latino, or Spanish origin	21 (46.7)	6 (30.0)	12 (48.0)	0.358
Not of Hispanic, Latino, or Spanish origin	24 (53.3)	14 (70.0)	13 (52.0)	

*Statistically significant difference between auto shops and beauty salons ($P < 0.05$).

Table 2. Survey responses regarding pandemic-related barriers faced since March 2020

	Auto shops (N = 20) n (%)	Beauty salons (N = 25) n (%)	χ^2 P-value
Temporary or permanent closure	8 (40)	22 (88)	0.002*
Received financial assistance	8 (40)	11 (44)	0.334
Had difficulty purchasing products			
Disinfectant/cleaning supplies	15 (75)	17 (68)	0.382
Hand soap/hand sanitizer	11 (55)	11 (44)	0.240
Personal protective equipment	9 (45)	13 (52)	0.868
Received at least one vaccine dose	16 (80)	21 (84)	0.526

*Statistically significant difference between auto shops and beauty salons ($P < 0.05$).

Participants were asked about their ability to purchase disinfectants or cleaning supplies, hand soap or sanitizer, and PPE. Disinfectants were the most difficult products to purchase, followed by hand soap or sanitizer for auto shops, and PPE for beauty salons (Table 2).

To determine if there was a difference in vaccination rate between the two business types, we asked participants if they had received at least one dose of a COVID-19 vaccine. For auto repair shops, 80% of the respondents said yes, while for beauty salons the vaccination rate was 84% ($P = 0.526$) (Table 2). Vaccination rates in Arizona at the time of this survey administration were approaching 60% (ADHS, 2021).

Information regarding the number of respondents that use various safety practices in their workplace as prevention strategies for COVID-19 transmission is presented in Table 3. The most often used practices were increased frequency of workplace cleaning and disinfection, requiring hand washing or sanitizing more regularly, and use of masks by staff. The least often used practices included using portable air filters or UV lights for air disinfection. Beauty salons were significantly more likely than auto shops to require the use of face masks for clients ($P = 0.005$), face masks for workers ($P = 0.015$), and limiting the number of workers inside the business ($P = 0.034$) (Table 3).

Owners, managers and workers from both beauty salons and auto shops sought updates primarily from local (31/45) and national (29/45) news media, followed by government websites (27/45). Social media (22/45) and family or peers (20/45) were used less than news outlets and government websites, but far more often than university websites (5/45). Trade groups (14/45) were more popular sources of information for beauty salon workers (13/25) than auto workers (1/20) (Fig. 2). 'Other' write-in options included talk radio, emailed updates, news articles, corporate heads, clients, and, interestingly, banks.

Qualitative findings

Approximately half (25/45) of the participants responded to one or more of the open-ended questions. Respondents expressed substantial anxiety and stress, including concerns related to finances due to lockdowns and the long-term viability of their business, unwillingness of employees to return to work, uncertainty regarding the progression of the pandemic, conflict over suitable health and safety protocols, and concern about personal or family health and well-being. Auto workers were more likely to discuss financial concerns, while beauty salon workers focused on health and safety.

Illustrative quotes were selected and categorized into the social-ecological framework (Table 4). Most responses were categorized into the interpersonal level, demonstrating respondents' concerns about their clients and coworkers, emphasizing their anxiety regarding the health of their employees and their customers, and describing conflict over mask protocols or other protective measures. On the organizational level, the financial health of the business and the physical health of the workers were major concerns. At the level of policy, comments reflected on the perceived failure of government measures to adequately alleviate their financial burdens, in particular noting dissatisfaction with disproportionate aid being given to larger corporations.

Discussion

Our study found that in both beauty salons and auto repair shops in Tucson, Arizona, the pandemic has caused small business owners and workers to struggle financially and emotionally. Limited access to supplies, insufficient economic assistance, and the unremitting possibility of viral exposures led many small businesses to close, either temporarily or permanently. We verified that small businesses struggled to access supplies, particularly for the auto repair shops. Despite the fact that beauty salons

Table 3. Safety practices implemented by businesses to prevent transmission of COVID-19

	Auto shops (N = 20) n (%)	Beauty salons (N = 25) n (%)	χ^2 P-value
Increase rate of surface cleaning/disinfection ^b	13 (65)	22 (88)	0.138
Use hand sanitizer or require hand washing ^a	13 (65)	22 (88)	0.138
Ask staff to wear face masks in the shop ^b	8 (40)	20 (80)	0.015*
Change filters in the ventilation system ^c	11 (55)	14 (56)	1.000
Use contactless payment methods ^c	8 (40)	17 (68)	0.212
Ask clients to wear face masks in the shop ^b	5 (25)	18 (72)	0.005*
Limit number of clients in the shop ^b	6 (30)	15 (60)	0.270
Appointments only, no walk-ins allowed ^b	6 (30)	13 (52)	0.402
Make improvements to indoor air ventilation ^c	6 (30)	8 (32)	1.000
Use plastic barriers (like at the check-out desk) ^c	6 (30)	7 (28)	1.000
Limit number of workers in the shop ^{b,†}	1 (5)	10 (40)	0.034*
Screen workers before coming in to work ^{†,c}	5 (25)	6 (24)	1.000
Screen clients before appointments ^b	3 (15)	5 (20)	0.965
Use a carbon dioxide monitor ^c	2 (10)	5 (20)	0.613
Other	2 (10)	4 (16)	1.000
Use a portable air cleaner ^c	1 (5)	4 (16)	0.491
Use UV lights ^c	2 (10)	2 (8)	1.000
None	2 (10)	0 (0)	0.374
Prefer not to answer	0 (0)	1 (4)	1.000

^aPPE controls.

^bAdministrative controls.

^cEngineering controls.

^dElimination/substitution controls.

^eStandards/enforcement.

*Statistically significant difference between auto shops and beauty salons ($P < 0.05$).

[†]Temperature check, symptom questionnaire, or other.

were not using their products as quickly due to closures and limited appointments, the percentage of participants that indicated difficulties with ordering supplies was still relatively high. Based on the open-ended responses, workers in businesses who remained open believed they were expected to protect themselves and their customers from COVID-19 without clear protocols, often at their own expense.

These findings are consistent with prior research that evaluated the response of small businesses to the pandemic (Bartik *et al.*, 2020; Fairlie, 2020; Kalogiannidis, 2020). Bartik *et al.* (2020) found that 43% of the small businesses in their study closed temporarily due to COVID-19, and that businesses with in-person services were more negatively affected than those with less person-to-person interactions. About 70% of the businesses in their study expected to receive governmental financial assistance, while our respondents indicated that only 40% of auto shop workers and 44% of beauty salon workers were successful in doing so. In an analysis of the April 2020 Current Population Survey (CPS), Fairlie (2020) found that 22% of small

business owners nationwide closed their businesses due to COVID-19. Fairlie also discusses disparities within this percentage, as minority owners tended to be more likely to lose their business. For example, Latinos saw a 32% decrease in business ownership during this time. Kalogiannidis (2020) examines how supply chain issues, social distancing, and travel bans created financial stress for small businesses. In Southern Arizona, the economic impact of closed borders was particularly visible, as the exchange of ‘non-essential’ goods and services between Mexico and the United States was entirely hindered (Sandin, 2020; Uhler, 2020; USDHS, 2020).

In general, beauty salon workers were more likely to obtain information from almost all listed options than auto shop workers, implying that salon workers were more likely than auto workers to actively seek out news about COVID-19. This is particularly poignant because of the rapid developments regarding recommendations and guidelines for businesses to minimize transmission of SARS-CoV-2. Anchoring bias, which occurs when people rely most heavily on the first information they receive when making decisions, may play a large role

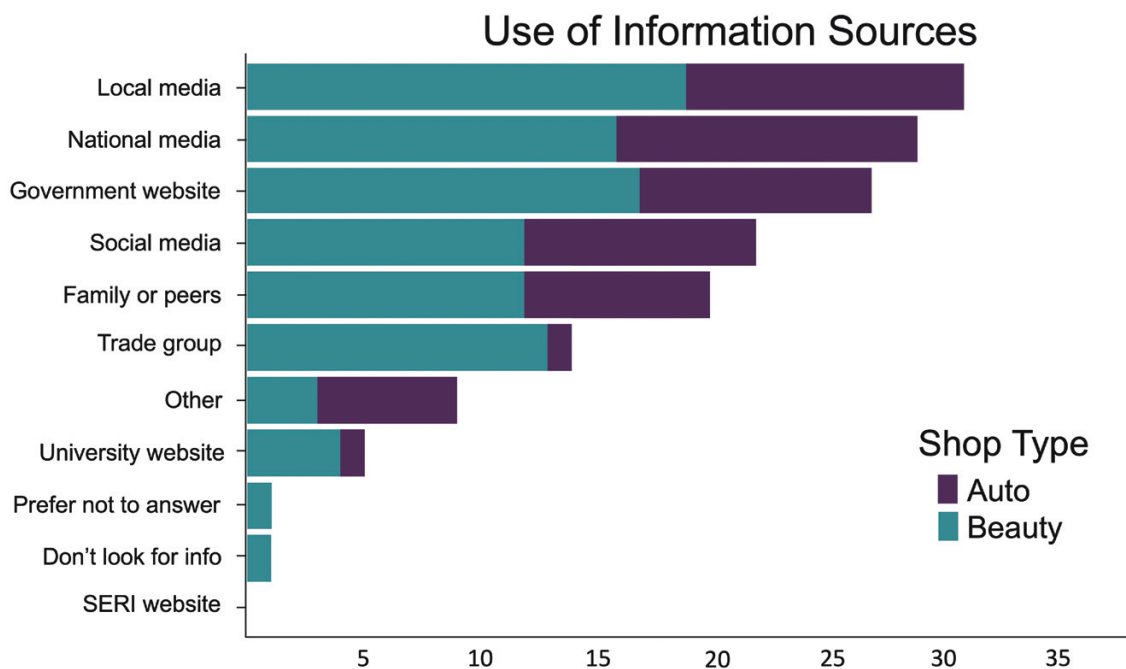


Figure 2. Number of participants by shop type that reported using these information sources to receive updates regarding COVID-19.

in the response of businesses (Mohamed *et al.*, 2021). Because transmission was initially thought to occur primarily from contact with contaminated surfaces instead of the currently accepted aerosols, some businesses may have been less likely to implement safety practices that are more protective from transmission via contaminated air. This may help explain the low numbers of respondents who used portable air filters or UV lights, which are highly effective at neutralizing airborne viruses. The trends regarding the safety practices used by these businesses to minimize infection over time are generally the same for beauty salons and auto shops, although salon workers were more likely to implement almost all of the practices in their workplace. Significant differences were seen in mask-wearing and limiting number of in-person workers, both of which are controls that effectively minimize aerosol transmission (Clase *et al.*, 2020; Sun and Zhai, 2020; Bazant and Bush, 2021; Cheng *et al.*, 2021). Previous studies have found an absence of transmission despite confirmed exposures in hair salons that required mask wearing, reiterating the value of masks in the workplace (Hendrix *et al.*, 2020; Swaney *et al.*, 2021).

Economic issues were discussed far more often than health and safety concerns. This could be because many of the surveys were completed while respondents were at their workplace, bringing income to the forefront of their

minds. If the surveys were instead completed at home, they may have focused more on the health of themselves, their family, or their friends. Additionally, the surveys were distributed beginning mid-year of 2021, more than a year after the start of the pandemic. This may have led to ‘COVID-19 burnout,’ where those who are exposed to prolonged interpersonal stressors, particularly while on the job, become exhausted by continually thinking and talking about health issues (Maslach and Leiter, 2016; Arslan *et al.*, 2021), which could have made them less likely to want to discuss their health concerns. However, occupational safety is of paramount importance during a pandemic and deserves a unique focus.

Further analysis of this discrepancy between responses involving economic versus health concerns showed dissimilarities between auto repair shop and beauty salon responses. Auto shop workers were generally more concerned about financial precarity than were beauty salon workers. As designated ‘essential’ businesses, they were less likely to be closed due to government shutdowns than beauty salons. Despite this, open-ended responses indicated that auto shops showed a much greater concern about economic uncertainty than health and safety. Personal safety may have been more salient for beauty salon workers because they must often be within six feet of their clients

Table 4. Selected participant responses from three open-ended questions sorted into social-economic model categories

SEM category	Auto shop	Beauty salon
Individual	<ul style="list-style-type: none"> I have concerns for life. Workplace is the last of my concerns, but everything else worries me. 	<ul style="list-style-type: none"> My worry was worse before getting vaccinated, but now I'm not so concerned about it.
Interpersonal	<ul style="list-style-type: none"> Anti-maskers and customers that spread misinformation to other customers. ...My main concern is fear customers have, new or regulars, about the dangers of me meeting them in person at their homes to do the said work. 	<ul style="list-style-type: none"> I didn't know how to tell people to leave without a mask without being confrontational. [We were] fighting about masks protocols. Another outbreak. Two workers [got] sick, one almost died. Terrifying! Put me at risk, too. Some people can't work because of health problems, and I worry about elderly customers and the people with kids since they can't get the vaccine. I had a male coworker attack me, almost physically violent, because I offered his client a mask. So much fighting over whether COVID is real or not has caused damage to our industry.
Organizational		<ul style="list-style-type: none"> [I am] concerned for health and finances of the workers and the shops. I heard [company name redacted] aren't paying workers minimum wage so they can withstand another lockdown. Business [was] down for 45%–55% of the time, but we made it. We're still requiring masks until we feel safe. Having to use one cape per customer was expensive. Bought more regular capes and washed/disinfected those more often instead. Had to buy gear or something for [my] own protection and rewashed that often.
Community	<ul style="list-style-type: none"> I worry that the anti-vaccine movement will succeed in spreading misinformation and cause a reverse in the recovering economy and in the transmission of the disease. We would not recover from another surge. 	<ul style="list-style-type: none"> [I worry about the] influence in change of kids going to school.
Policy	<ul style="list-style-type: none"> [I] want to get back to normal for small businesses, not continue to favor large businesses. When is the government going to free up the unemployment benefits? Because you can't find workers. Forced regulations should instead be personal choices because people are smart enough to know when to wash [their] hands. [The] government has no authority! 	<ul style="list-style-type: none"> [We had] money problems. [We] did not get PPP loan. [We] applied and were turned down.

for more than 15 min (defined as 'close contact' by the CDC), increasing the likelihood of COVID-19 transmission. On the other hand, auto repair workers tend to do their jobs with limited direct contact with the public. This may have given them more time to focus on the COVID-19 related impacts on their finances stemming from minimized travel, low traffic

because of the shift to working from home, and the widespread lack of vehicle usage during periods of the pandemic. Auto shop workers described difficulties related to COVID-19 as a top-down issue, concentrating on how COVID-19 safety regulations, such as lockdowns and social distancing, are affecting profits.

Our analysis underscores the importance of applying a social-ecological framework when considering worker health and safety. Many of the survey comments aligned with individual, interpersonal and organizational levels of the SEM, indicative of lacking public health policies that could have protected them against these concerns. For example, one participant mentioned fighting with a coworker about mask protocols while at work. Convolved policies regarding mask use from local and state governments likely contributed to this type of interpersonal conflict. It is notable that the state and local governments in Arizona were often at odds about mask mandates during this time (Weissert *et al.*, 2021). Agencies that focus on a population's well-being, like local nonprofit organizations, industry-specific trade groups, or health clinics, are important community-level resources that can work with businesses to help them disentangle the confusing and opposing views of policy makers.

The most frequently reported COVID-19 mitigation practices fall into the administrative levels of the HoC (Table 3), which rely on individual behavior change. Many strategies minimize transmission, but do not provide personal protection, other than N95 or equivalent respirators. The businesses that incorporated engineering options, such as using portable air filters or UV lights, generally did so at a much lower rate than other options. Changing the air filters on ventilation systems was done more often than other engineering controls, but this response may reflect normal routines unrelated to COVID-19 concerns. Engineering controls are noticeably lacking, potentially because these typically require modifications to the building, which can be expensive to install and maintain. Moreover, business complexes may have one central ventilation system, preventing owners from making modifications to their worksite, especially if the space is rented. This highlights the need to reach these businesses with information resources that emphasize the airborne transmissibility of SARS-CoV-2 and the control options available to minimize that risk, such as UV lights or portable air filters.

Participants reported that they used news media and governmental websites as their primary sources for COVID-19 updates. This is noteworthy when considering effective public health communication. There is a strategic and direct connection between community health and safety and the scientific literacy of citizens, which is ultimately what leads to empowerment, action, and change (Christensen *et al.*, 2016). According to our survey, the main source of pandemic information is local news, which can and should be used for community-level engagement to encourage use of the upper levels

of the HoC and to share resources about how to apply for financial support. This is particularly important at a time when facts are politicized. Data are easily obtained and readily available, but if it is not accessible to the layman and presented without bias, progress in sustaining healthy workplace environments will be hindered. The connection between short-term actions and long-term consequences is a difficult concept to present to the public, particularly when public health advocacy is at odds with economic gains.

A key missing step in keeping people safe is the engagement of the entire community to help guide policymaking and then translate that policy into action. This is emphasized by the qualitative analysis, in which some respondents expressed the desire for action to be taken at the community and policy levels where it is currently lacking. In this sense, the involvement of intermediaries, such as CHWs, would be beneficial to help decipher and translate the information coming from local, state, and federal authorities while also hearing the concerns and understanding the barriers faced by workers and businesses to promote health and safety in the workplace, which can then permeate into the rest of the community members (Sinclair *et al.*, 2013). The use of CHWs can help bridge the gap between policy and practice (Koch *et al.*, 1998; Friedman *et al.*, 2006; Rosenthal *et al.*, 2010); however, this does not address the lack of policy mentioned above. Creating an easily interpretable, accessible, and comprehensive preparedness plan that protects worker health while providing an economic safety net will help optimize community adaptability and endurance for future pandemics.

There are several limitations in our survey. The small number of responses ($n = 45$) gives limited statistical power for quantitative analyses. While we reached a population that is often understudied, it is still difficult for these workers to participate in research studies. With limited downtime, they are sometimes reprimanded by their employers for diverting their attention away from the business. Our response rate for the survey was only 6.9% (45/656), signifying that nonresponse bias may be present in these results (Draugalis and Plaza, 2009). Additionally, because we reached out to small business workers at their workplace, we are very likely missing input from businesses who were most heavily affected, as they remained closed at the time of our recruitment and therefore could not be reached. Although we did not document the name of the workplace in the survey, it is possible that some of the businesses were part of larger chains that were better situated to endure a pandemic, resulting in survey responses that may not accurately depict the struggles of smaller businesses. Additionally,

we did not gather information about whether the businesses were family owned and operated, although it is unclear whether this would skew responses towards economic hardships or health concerns. Finally, information about whether the businesses rented or owned the shop space was not collected but could play a role in the responses, particularly for questions that consider financial standing or the ability of businesses to make changes, such as to ventilation systems. Further studies that can capture these details would be beneficial for understanding the intricacies of small business decision-making. Despite these limitations, our study had many strengths. By allowing both closed- and open-ended questions, we were able to draw upon the experiences of each individual to create a bigger picture of the common workplace practices among small businesses. The qualitative analysis provided a meaningful backdrop against which the quantitative analysis could be better understood.

This study can be used as a foundation for future research regarding factors that lead businesses to develop and strengthen safety cultures for times during and beyond a pandemic. Although our study focused on only two industries, future research can employ similar methods for other commercial sectors to improve our understanding of the operations of small businesses as a whole. These may include businesses that commonly employ other minority populations, businesses with less prominent gender homogeneity, or other small businesses that interact with the public in different ways, such as massage parlors or restaurants. As of 2013, the small business sector represented 48% of the American workforce (SBA, 2016). Additional studies should further address ways for small businesses to better understand and apply the HoC framework to protect workers from everyday hazards. Given the limited staff and resources of the regulatory agencies, CHWs may be an important conduit for bringing and translating this information to underserved communities.

Conclusions

In the time since we began conducting our survey, the Delta and Omicron variants have emerged, further underscoring the reality that managing the spread of this infectious disease should remain a public health priority. Our findings on the response of small businesses to the COVID-19 pandemic make clear the importance of providing owners and workers with the tools to protect themselves and their community through sustained educational outreach and support during public health crises. Disseminating reliable

sources of information early on can cut back on misinterpretations of facts, which can have lasting impacts on how people view and respond to endemics or pandemics. In the future, sufficient emergency-use funds for small businesses could help prevent polarized reactions that can lead to unsafe work environments. In a time when agreement between policy makers is limited, trusted community leaders, such as CHWs or board members of trade associations, can encourage individuals to make safe, feasible, and sustainable business decisions that are relevant to their specific industries. Not only can they be a source of information, but they can also provide outlets for small business workers to discuss barriers to implementation that can then be considered when developing future control strategies. However, clear and consistent nonpartisan guidelines and policies across all levels of government would be most effective in helping small business workers navigate in an ever-changing world.

Supplementary Data

Supplementary data are available at *Annals of Work Exposures and Health* online.

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Conflict of interest

The authors declare no conflict of interest relating to the material presented in this article. The publication's contents are solely the responsibility of the authors and do not necessarily represent the official views of the National Institutes of Health.

Data availability

The data underlying this article cannot be shared publicly due to concern for the privacy of individuals that participated in the study. If a reasonable request for deidentified data is sent to the corresponding author, the data may be shared pending consultation from the University of Arizona IRB and community research partners.

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