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ORIGINAL PAPER

Human Services During the COVID Pandemic: Using Behavioral Safety Programs to Protect Human Services Workers and Students

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Abstract

Objectives Behavioral safety programs have been effective in decreasing injuries across a number of industries. The COVID-19 pandemic is placing stress on the human services field—an industry already noted for its high injury rate. As most organizations resume full operation in the midst of the pandemic, procedures to mitigate the risk of virus transmission are vital. The current manuscript describes the use of a behavioral safety program and its effects on COVID-19 transmission in a school serving setting.

Methods This case study consisted of implementing an organization-wide behavioral safety program in a private school that served students diagnosed with autism spectrum disorder. During the course of the study, 124 to 128 direct care staff were employed by the school and served 168 students during the COVID-19 pandemic.

Results During the behavioral safety program, there were a variable but continuous number of safety observations. The percent of safe behavior in the classrooms began near 90% and approached 100% at the conclusion of data collection. During the study there were no documented COVID-19 infections traced to the school.

Conclusions Behavioral safety programs could be effective in promoting behavior associated with minimizing virus transmission; therefore, these programs may also have utility in preventing communicable diseases in human service settings.

Keywords Behavioral safety · Behavior-based safety · Autism spectrum disorder · Human services

The current COVID-19 pandemic has temporarily altered the service delivery of many human services organizations. The nuance of operating clinics, day programs, schools, and other services where clients congregate in groups requires individualized decisions based upon characteristics of the clients such as tolerance of masks (Cox et al., 2020). Many human service settings necessitate close contact with clients, many of whom may be resistant to the use of personal protective equipment (PPE). Operating during a pandemic requires robust safety plans that outline procedures to minimize the risk of transmission. In addition to robust safety plans, organizations may consider behavioral safety programs to promote adherence to the procedures outlined in the safety plan.

Behavioral safety programs are packaged interventions that promote safe practices to decrease injuries (McSween, 2003). While there are variations between specific implementations, all behavioral safety programs share basic characteristics. First, the work environment is analyzed to ensure that safety procedures are in place (e.g., safety equipment is catalogued and available, an injury documentation procedure is in place). During the safety assessment, hazardous conditions that are present and can be fixed through repairs or purchasing new equipment are addressed.

During the assessment process, employee injuries are analyzed to determine what type of accidents are occurring most often, and what behavior changes might make these events less likely to occur. The behaviors that are most likely to lead to injuries when conducted in an unsafe fashion are then operationally defined so that observers can differentiate between safe or at-risk topographies. The behaviors are then incorporated into a single measurement system and an observation schedule is established.

After defining methods to measure the behaviors over time, trained observers provide in situ feedback to employees related to safe and at-risk behavior based on their observations. Over time, progress toward safety goals, typically

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number of safety observations completed and percent safe averaged across participants, is reviewed regularly by safety teams. Employees often receive general feedback related to overall progress toward the safety goals and programmed reinforcers may be delivered (Sulzer-Azaroff & Austin, 2000). In the last several decades, there have been several publications demonstrating the success of these essential behavioral safety components.

In their seminal article, Fox et al. (1987) examined injuries in two open-pit mining sites. Before intervention both mines experienced days lost due to on-the-job injuries that substantially exceeded the national average for the industry. The researchers implemented a behavioral safety plan with many of the elements outlined above, but also included a token economy. The tokens, unique stamps, could be earned by avoiding lost-time injuries. Stamps could also be earned for other specified circumstances (e.g., suggesting safety improvements that were subsequently adopted) and lost for failure to report an injury. The stamps could then be exchanged at local stores for any number of common household items. The researchers were able to significantly decrease lost time hours due to injury in both mines to rates well below industry average. Moreover, the decreases in injuries were maintained for more than 10 years in both mines.

Packaged behavioral safety programs have been implemented across numerous industries including mining, construction, and agriculture among others (Alavosius et al., 2000). In addition to being widespread, these programs are largely effective where applied. In their review, Sulzer-Azaroff and Austin (2000) found that behavioral safety programs were successful in decreasing injuries across 32 of 33 peer-reviewed applications.

While behavioral safety programs have been effective in decreasing on-the-job injuries, there have been few empirical descriptions of behavioral safety programs in human services organizations. Workplace injuries are especially relevant to human services, which fall under what the Occupational Safety and Health Administration (OSHA) calls “health care and social assistance”. In 2018, OSHA reported 3.9 injuries for every 100 full-time employees in healthcare and social assistance jobs (Bureau of Labor Statistics, 2019)—a higher rate than the average of 2.8 injuries for workers across all private industries. A recent exception demonstrated the benefit of safety programs in a school setting Pugliese et al. (2021). The authors implemented a written assessment (PDC-Safety) to determine why employees working with individuals who had histories of engaging in aggression were failing to consistently wear prescribed safety equipment (e.g., arm guards, jean jacket, hat, etc.). Results of the assessment suggested that there were insufficient consequences to maintain behavior. Interventions were implemented that consisted of feedback and incentive systems across three classrooms and resulted in increased use of safety equipment. The increase in compliance with using safety equipment resulted in a decrease in sustained injuries in staff members.

To date, there are no known demonstrations of behavioral safety plans applied to decrease the transmission of communicable illnesses in human services. Beginning in March 2020, the CDC provided myriad recommendations, some of which included wearing masks, maintaining 6-feet of distance from others, cleaning high touch surfaces, and regular hand washing to prevent the spread of COVID-19 (CDC, 2021). Ensuring employee adherence to CDC guidelines should decrease the likelihood of COVID-19 transmissions—much like adhering to the proper safety protocols has reduced the risk of injury in other applications. This is especially important in human services where the clients served may not be able or willing to follow the safety recommendations put forth by the CDC. The current manuscript describes the implementation of a behavioral safety program that was initiated shortly after a private special education school resumed in-person services but before any COVID-19 vaccines were widely available. It was hypothesized that a behavioral safety plan could increase the newly identified safe behavior required by the COVID-19 mitigation plan.

Methods

Participants

Participants were teaching assistants at a private school in Central Virginia, USA, serving students diagnosed with autism spectrum disorder (ASD). Students ranged in age from 5 to 22 and consisted mainly of those with level 3 ASD. Students were provided with both educational services, based upon their individualized education plan, and behavior analytic services based upon the Comprehensive Application of Behavior Analysis to Schooling model. During data collection, the school employed between 124 and 128 teaching assistants and served 168 students. All participants possessed a high school diploma, and some possessed bachelor’s or master’s degrees. Seventy-one percent of employees identified as women, and 29 percent identified as men. The mean age of employees was 26 years age, ranging from 18 to 63.

Procedures

All data were collected in the school. The school returned to in-person services using a modified schedule where half of the students were physically present each week. The teaching assistants worked in classrooms of six to eight staff members and were supervised by a special education teacher. Each classroom served six students, approximately

three were present each week. Teaching assistants provided services to students in person or via telehealth from their assigned classrooms.

Safety Assessment

The school implemented numerous safety processes before bringing students back (e.g., daily health screenings for employees, additional safety equipment to prevent sharing, mandated time away from work if COVID-19 symptoms were reported)—a full list is available from the authors upon request. Based on these procedures and CDC guidelines, the authors created observable targets and definitions of employee behavior that would support the safety efforts. Most targets were related to controlling the spread of airborne viruses; however, two targets (appropriate lift, and keeping hands above waste) were also included because of correlations with staff injuries in the past. After creating an observation sheet (Table 1), the first author sent it to all supervisors in the school for feedback on proposed definitions of safe and at-risk behavior. Definitions for each target were printed on the reverse of the data sheet (Table 2).

Monitoring and Feedback

Initially, one data collector, a research assistant employed by the school, was trained by the first author to conduct observations. Data were collected twice weekly in each classroom in the school. Classes were scheduled for 10-min observations such that the time and day of the observations were randomly determined. During the observation, the data collector stood in an unobtrusive location in the classroom and recorded the safe vs. at-risk behavior on the safety datasheet. The data collector also examined the classroom for hazardous work conditions (e.g., a wet floor, desks placed too close to each other). If hazardous conditions were observed, they were recorded in the notes on the data sheet, and immediately corrected.

At the conclusion of each session, the data collector approached each staff member and provided feedback. If the employee had no at-risk tallies, they were thanked for looking after the safety of the students and their co-workers. If an employee engaged in any at-risk behavior, the data collector provided a brief statement of correction (e.g., I noticed your mask slipped down over your nose, please remember to wear the mask so that it covers both your mouth and nose) and asked if there were any comments, which were recorded on the comments section of the data sheet.

Over the course of the program, several more data collectors from the employee population were trained and took over most observations. Volunteer employees were trained by the research assistant using behavioral skills training. After training, the research assistant shadowed the new data collectors during observations. When the new data collectors completed three consecutive observations without data collection or feedback errors, they were allowed to collect data independently and were placed in the observation rotation. Volunteer employee observers were trained to take over most of the data collection as research has indicated that collecting safety data can increase the safe performance of the observer (Alvero et al., 2008). The research assistant continued to collect occasional data as needed and also shadowed new observers at least once per week. While shadowing the observers, the research assistant observed the classroom and conducted independent safety observations. When the research assistant shadowed the new data collectors, the data sheets were compared at the end of each session to ensure accuracy. Only minor errors were noticed on occasion (e.g., incorrect date) and were immediately corrected.

Measures

The data sheet was constructed such that safe and at-risk behavior could be tallied. For example, "mask use" was the first target and since each classroom contained eight staff members, if one staff member removed and then replaced their mask during an observation, seven safe and one at-risk tallies would have been recorded next to mask use. Note that some targets such as "use of appropriate lift" required a student who was sitting on the ground requiring assistance. If no such opportunities arose during the observation, the data collector marked N/A.

Data Analyses

Weekly, the research assistant gathered all safety data sheets and tallied the total number of sheets (i.e., observations) conducted per week. Additionally, percent safe behavior was calculated by adding up the total safe tallies from each data sheet during the week, dividing by the total safe and at-risk tallies from all sheets and multiplying by 100. These data were graphed and reviewed weekly via visual analysis. A plan was in place for additional intervention should the average safe behavior consistently drop below 85%, but this was not necessary during the observation period.

Results

During the 16 weeks of data presented, observations fluctuated with an average of 42 conducted per week (Fig. 1). The observations were spread across the school with the goal of at least two observations per week in each classroom. On occasion, due to absences or holidays, two observations per classroom per week was not possible, but every classroom was observed at least once per week.

Table 1 Sample data collection sheet

Observer: Date: Time: Location:

Instructions: For each component you observe, record the number of individuals engaging in safe and at-risk behavior in the respective columns. If additional explanation is required, use the notes section. If you do not observe any instances, simply check "N/A"

Infection Control	# Safe	# At-risk	N/A
Mask use			
Proper glove use and removal			
Appropriate distance between clients			
Wash/sanitize hands when exposed to contaminates			
Wash hands after working with client			
Performance with Clients			
Appropriate distance between staff and client			
Use of appropriate lift			
Hands held above waist when client is agitated			
General			
Equipment disinfected after use			
Face shield/other prescribed PPE			
Instructional items put away after use			
Unsafe work conditions			
Comments			

Total Safe:
Total At-
% Safe:

Visual inspection suggests an upward trend in the number of observations; the increase is due to an increasing number of trained observers as the study progressed.

The school observations averaged 91% safe across all weeks (Fig. 2). Across the school, the safe behavior maintained at a stable rate; however, there was some minor

Table 2 Definitions of safe behavior

Mask use	Wearing a cloth mask such that it covers the nose and mouth
Proper glove use	Wearing approved gloves when in contact with contaminants* and removing correctly after use
Appropriate distance between clients	Ensuring that all clients are 6 feet apart. Transitioning clients will not be closer than 6 feet with another client for more than 30 s
Wash/sanitize hands when exposed to contaminates	Covering all surfaces of hands with sanitizer or washing hands for at least 20 s after glove use, or when exposed to contaminants
Washing hands after working with a client	Washing hands for at least 20 s when transitioning between clients
Appropriate distance between staff and client	Ensuring that all staff not currently assigned to work with the clients are 6 feet apart. Transitioning clients will be not be closer than 6 feet with an unassigned staff member for more than 30 s
Use of appropriate lift	Implementing approved lifting procedure when a client requires assistance
Hands held above waist when client is agitated	If client is agitated (yelling, swearing, minor problem behavior, or other noted precursors) staff keep hands above their waist
Equipment disinfected after use	All protective or PPE equipment are appropriately cleaned after using provided disinfectant spray/wipes
Face shields/other prescribed PPE	Appropriately donning any unique PPE if assigned to a client for whom extra PPE is programmed
Instructional items cleaned after use	After use with a client, all instructional items and surface areas are cleaned using provided disinfectant spray/wipes

*Any bodily fluid, items thrown into garbage, soiled cleaning supplies or clothes, or surfaces that have been exposed to any of the aforementioned items without being sanitized

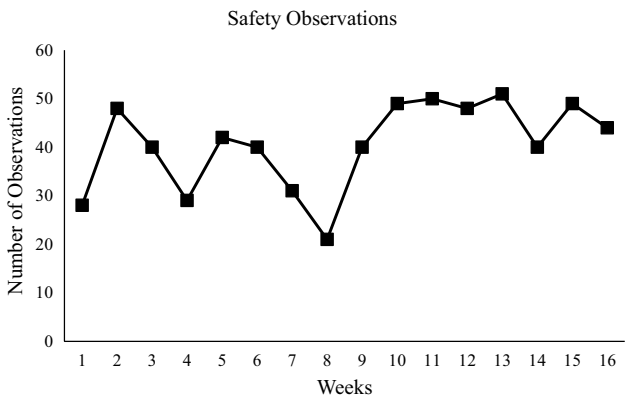

Fig. 1 Safety observations conducted per week

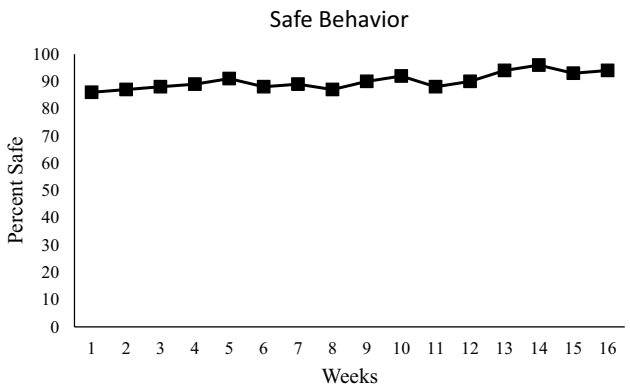

Fig. 2 Percentage of safe behavior from observations

variability within the individual classrooms. The feedback did improve these minor variabilities over time which is reflected in a small increase in the safe behavior demonstrated in weeks 13 through 16.

During the 16-week observation period, 16 staff members were confirmed to have contracted COVID-19. However, careful contact tracing performed in tandem between the school leadership and local health department (i.e., analyzing when and where they were working and with whom they worked) indicated that none was due to exposure at the school setting. That is, no staff members were infected with COVID-19 at the school. Additionally, daily safety screening procedures ensured that employees were prevented from entering the campus while ill. While safety protocols remained in place, the behavioral safety program was phased out after the 16-week period as the COVID-19 vaccine became widely available and data indicated that over 85% of staff members elected to receive the vaccine.

Discussion

Initial results from the behavioral safety plan suggest that the target behaviors—behaviors associated with controlling the spread of viruses—increased following introduction of the program. This is especially important given that in the school many students were unable to wear masks, maintain social distance, or fully comply with other CDC guidelines. Therefore, the employees were charged with keeping

themselves and the students safe while providing services to a population that greatly benefits from in-person instruction.

The cost of the program was minimal. In the current study, most of the office materials were already on-hand, the primary data collector was already on staff and had other duties suspended due to the pandemic, and the first author was able to oversee the design and implementation. Other organizations may endure additional costs if consultants or employees must be hired to implement the initial components of the program (assessment, creation of data sheets, and training of observers) which was the most resource intensive period.

Limitations and Future Research

A limitation of the present study is that experimental control was not established, and so it is not certain that the behavioral safety program was responsible for the lack of COVID-19 transmission, although every day during the study the Virginia Department of Health reported 19 to 185 cases of COVID-19 in the city where the school was located. The transmission in the community was moderate to significant as characterized by the Virginia Department of Health, anecdotally suggesting that the behavioral safety program was helpful in preventing the transmission of COVID-19. Still, it could simply be a coincidence that there was not transmission in the school, or that the safety protocols, irrespective of employee adherence to specific aspects of the plans, prevented disease transmission. Moreover, safe behavior may have maintained at high levels without on-going monitoring and feedback, although some improvement was noted in the percent safe as the program progressed. Future research should replicate these procedures using a more rigorous research design as the ethical liability associated with withdrawing or withholding treatment to establish experimental control was not acceptable during a pandemic. Additionally, careful cost–benefit and social validity analyses should be conducted to determine the money spent on the program versus money saved by improved employee health, and employee perceptions of such programs.

Behavioral safety programs could be of benefit to other human services organizations not only with the current COVID-19 pandemic, but to decrease other transmissible illnesses (e.g., flu, common colds) among a potentially vulnerable population. Each year the flu kills approximately 290,000 to 645,000 individuals worldwide (Luliano et al., 2018). As noted earlier, some individuals who receive human services lack self-care skills or may be resistant to disease prevention strategies. In these situations, the behavior of the caregivers and employees becomes vital to mitigate the spread of disease. The procedures used in the current manuscript suggest a strategy that could assist in keeping both employees and service recipients safe.

Author Contribution BW: designed the study, conducted data analysis, and wrote the manuscript.

TD: conducted data collection and assisted in developing the data collection sheet.

Data Availability The research review committee approval did not include transmitting data outside of the Faison Center.

Declarations

Ethics Approval This study was approved by the research review committee at the Faison Center.

Conflict of Interest The authors declare no competing interests.

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