Preventive Medicine Reports 19 (2020) 101154

Contents lists available at ScienceDirect

Preventive Medicine Reports

journal homepage: www.elsevier.com/locate/pmedr

Workplace-based opportunities to support child care workers' health and safety

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ARTICLE INFO

Keywords:
Worksite
Health promotion
Occupational health and safety
Total worker health

ABSTRACT

Child care workers earn among the lowest wages in the United States and they struggle with many health issues. The purpose of this study was to describe workplace supports for nutrition, physical activity, other health behaviors (e.g., smoking cessation, stress management), and occupational health and safety available to child care workers, and thereby inform the development of future workplace-based interventions to improve worker well-being. Between 2015 and 2016, 74 North Carolina child care centers (and directors), participating in a larger randomized controlled trial, completed a Workplace Health and Safety Assessment (interview and observation) measuring four domains: Infrastructure, Organizational Policies and Procedures, Programs and Promotions, and Internal Physical Environment. This study used baseline data to report means and standard deviations. Participating child care centers employed, on average, 12.7 ± 8.4 employees. Total scores from the Workplace Health and Safety Assessment averaged 41.3 ± 12.6 out of a possible 154, demonstrating many missed opportunities for supporting health/safety. More specifically, centers scored on average 9.5 ± 3.9 on Infrastructure (35% of potential points), 11.1 ± 3.9 on Organizational Policies and Procedures (32% of potential), 7.6 ± 5.4 on Programs and Promotions (12% of potential), and 13.1 ± 2.2 on Internal Physical Environment (49% of potential). The most frequent supports available were for occupational health and safety issues, while fewer supports were available for physical activity and other health behaviors. Child care workers could benefit greatly from more comprehensive workplace health and safety interventions; however, strategies must overcome centers' limited capacity and resources.

1. Introduction

The workplace is recognized as an important influence on workers' health and wellbeing. Workplaces can be leveraged to reinforce a culture of health by providing a supportive built environment (e.g., providing snack bars or vending machines with healthy food options, walkable areas, exercise spaces, ergonomically appropriate work areas), adopting policies and procedures to support workers' health (e.g., tobacco-free policies, safety procedures, leave policies), and supporting programs and communications about healthy lifestyle goals (e.g., health education materials, counseling, lunch and learn sessions, campaigns) (Flynn et al., 2018). Additionally, recognition is growing that workplace health promotion efforts would benefit from a "Total Worker Health" approach, which would also promote healthy and safe working conditions (e.g. flexible work schedules, fair compensation, hazard-free workspaces) (National Institute for Occupational Safety and Health, 2012). Total Worker Health recognizes that certain work environments increase risk for health problems (e.g., weight fluctuations,

Abbreviations: CARE, Caring and Reaching for Health; ICC, Intraclass Correlation; NAEYC, National Association for the Education of Young Children

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https://doi.org/10.1016/j.pmedr.2020.101154
Received 10 February 2020; Received in revised form 9 June 2020; Accepted 26 June 2020
Available online 30 June 2020

cardiovascular disease, depression) and, therefore, supports a holistic approach leveraging policy, practices, and programs to address adverse working conditions while also engaging with workers in efforts to promote safety and health (Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, 2018). Low-wage workers could benefit greatly from such workplace supports as these workers have lower life expectancies, increased risk for many chronic diseases, and greater exposure to physical and social hazards in the workplace (Baron et al., 2014). Unfortunately, their access to and use of such workplace health and safety promotion efforts is limited (Baron et al., 2014; Stiehl et al., 2018).

Child care workers are among the lowest-paid workers in the United States (Bureau of Labor Statistics, 2020). Additionally, evidence is accumulating that child care workers suffer disproportionately from an array of health risks. Several recent studies have documented high rates of obesity (34%–66%), elevated blood pressure (17%–22%), diabetes/pre-diabetes (7%–12%), asthma (19%), stress (67%), and depression (24%–41%) among child care workers (Whitaker et al., 2013; Linnan et al., 2017; Otten et al., 2019; Ling, 2018). Studies have also documented poor health habits (e.g., unhealthy dietary intake, low physical activity) (Otten et al., 2019; Ward et al., 2018). Furthermore, the nature of their work increases exposure to infectious diseases and musculoskeletal injuries (Bright and Calabro, 1999; Koch et al., 2015). Their work also includes multiple sources of stress, such as child behavior problems, inadequate staffing, and demanding schedules (Whitaker et al., 2013; Otten et al., 2019; Bright and Calabro, 1999; Friedman-Krauss et al., 2014). Adding to these burdens, child care workers report feeling a lack of respect generally, and from parents specifically, for their work (Otten et al., 2019). Improving the health and wellbeing of child care workers requires a comprehensive approach, like Total Worker Health, to address the multitude of factors at play.

The need for workplace health and safety supports has received increased attention in the child care community. The “Paths to a Healthier Child Care Workforce” report, published by Child Care Aware, captured critical barriers to a healthy lifestyle among child care workers and offered workplace strategies to support healthy lifestyle choices (Child Care Aware of America, 2017). In 2017, the National Head Start Association’s “Nurturing Staff Wellness Toolkit” offered a checklist of critical components for staff wellness programs (National Head Start Association, 2017). Although these efforts focus primarily on promoting healthy lifestyle behaviors, they also recognize the need to take a more comprehensive approach and address workplace health and safety issues such as health insurance benefits, work schedules, break time, and sick leave (Child Care Aware of America, 2017), which is consistent with the Total Worker Health approach (National Institute for Occupational Safety and Health, 2012).

To date, there have been very few efforts to develop and evaluate workplace-based health and safety interventions for child care workers. Existing child care-based studies focus largely on health promotion and show mixed results in terms of changing health behaviors (Ward et al., 2018; Gosliner et al., 2010; Herman et al., 2012). To develop comprehensive interventions, researchers and practitioners need information about the type and amount of workplace health and safety supports currently offered in child care settings. This information would help identify strengths that could be leveraged to support worker well-being as well as common weaknesses. Hence, the primary objective of this study is to identify workplace supports for health and safety that may be feasible for child care centers to offer their workers and to describe the frequency that such supports are present in a large sample of child care centers. A secondary objective is to describe measurement properties (e.g., internal consistency) of a child care-specific assessment of workplace supports for health and safety.

2. Materials and methods

The current study was conducted as part of a larger randomized-controlled trial, CARE: Caring and Reaching for Health, which developed and evaluated a workplace health and safety promotion intervention for child care workers (Ward et al., 2018). As part of this larger trial, workplace supports for health and safety were assessed in a sample of 74 child care centers. All study protocols were approved by the Institutional Review Board at the University of North Carolina at Chapel Hill and registered at ClinicalTrials.gov (NCT02381938, posted March 6, 2015). The current study uses baseline data only.

2.1. Participants

Participants were a convenience sample of 74 child care centers and center directors recruited from central North Carolina in 4 waves, each targeting a 1–3 county area. The multi-phase recruitment strategy engaged community partners to introduce the study to local licensed centers, then initiated direct contact via mailed invitations, follow-up phone calls, and finally in-person visits. A detailed description of recruitment and collection of signed consent are provided elsewhere (Ward et al., 2018).

2.2. Data collection

Data were collected during a one-day, on-site measurement visit at each child care center. Measures captured characteristics of centers (demographics) and center supports for health and safety (Workplace Health and Safety Assessment). All data collectors were trained on measurement protocols and certified by the project director before conducting director interviews and site observations.

2.3. Demographics

Center directors completed demographic surveys capturing center characteristics (e.g., years in operation, weekly enrollment fees, affiliation, quality rating, accreditation by National Association for the Education of Young Children (NAEYC), and participation in federally-funded child care subsidy programs), as well as personal characteristics (e.g., age, sex, race, ethnicity, education).

2.4. Workplace health and safety assessment

The Workplace Health and Safety Assessment was created specifically for the CARE trial to assess centers’ efforts to support worker health and safety, including: infrastructure, policies and procedures, programs and promotions, and environmental supports. Several existing instruments were reviewed (Centers for Disease Control and Prevention, 2014; Department of Health Services, 2018; Oldenburg et al., 2002; Abrams et al., 1994). Items drew primarily from the CDC Worksite Health Scorecard (Centers for Disease Control and Prevention, 2014) and the Wisconsin Worksite Wellness Resource Kit (Department of Health Services, 2018). Both instruments included sections on organizational supports/infrastructure/program components, physical activity, nutrition, stress management/depression/mental health, tobacco use, and emergency medical response plans. Where there was similar content, items were examined to see how wording might be improved or where additional items might be needed to ensure complete coverage of relevant content. Given priorities of the CARE trial, items about emergency medical response plans were not used. In addition, sections from the CDC Scorecard related to weight management, occupational health and safety, vaccine-preventable diseases, and community resources were incorporated. Items about occupational health and safety were customized to ensure that they captured issues most relevant to child care workers (e.g., sanitation, vaccinations, physical injuries, psychological stress) (Bright and Calabro, 1999; Swanson et al., 1994).

In consideration of participant burden, items were carefully screened for their potential feasibility within the child care setting.

Items asking about health promotion supports that would be highly unlikely in child care centers were removed. Skip patterns were used to streamline the survey. Similarly-worded items were merged. For example, the CDC Scorecard asks "During the past 12 months, did your worksite provide a series of educational seminars, workshops, or classes on nutrition?" and includes similar items about other health topics. This instrument asked "During the past 6 months, did your center offer any health and/or safety programs?" (defining programs as group meetings, classes, or activities) and offered a checklist of health topics. Some items were also revised to differentiate health promotion supports available for workers versus children (e.g., provision of healthy food options differentiated between food made available to staff and food served to children).

The final instrument included a director interview with 85 items and an observation tool with 46 items.

Data from the director interview and center observation were used to score child care centers across four domains, following suggestions of a review by Hipp et al. (2015): Infrastructure (e.g., dedicated people, money, time), Organizational Policies and Procedures (e.g., policies, guidelines, practices), Programs and Promotions (e.g., efforts to offer programs, media, activities, resources), and Internal Physical Environment (e.g., facilities, equipment, space). Infrastructure and Organizational Policies and Procedures used items from the director interview primarily; the Internal Physical Environment used items from the observation primarily; and Programs and Promotions used a combination of both. While the external physical environment (e.g., sidewalks and parks surrounding the center) was assessed, it was not used in the scoring given centers' lack of control over these elements. Individual items were scored, most often using 0 or 1 (0 = not present, 1 = present). However, some items captured greater specificity necessitating expanded scoring (e.g., who is responsible for health and safety activities was scored as 0 = no one, 1 = individual, 2 = group or committee; perceived importance of health program was scored on a Likert scale where 1 = not at all important and 10 = extremely important). Final scores for each domain represent a sum of all scores from component items. Higher scores indicate greater presence of supports for workplace health and safety. See Supplemental Materials for definitions of the four domains and a complete description the scoring rubric and items.

2.5. Analysis

Simple descriptive statistics were calculated to characterize participating centers and to examine the range of Workplace Health and Safety Assessment scores. Since the Workplace Health and Safety Assessment was a newly developed measure, baseline data were also used to evaluate the measurement properties. Kuder-Richardson Formula 20 (KR-20) coefficients were calculated to analyze the reliability of the domains and Pearson's correlations were used to examine potential relationships between domains. KR-20 coefficients less than 0.50 represent low internal consistency; values between 0.50 and 0.80 represent moderate; and values greater than 0.80 represent high internal consistency (Salvucci et al., 1997). While there is no set criterion about the magnitude of domain intercorrelations, correlations should be less than 0.80 for the composites to be considered unique and avoid problems with multicollinearity (O'Brien, 2007). See Supplemental Materials for additional information about testing. All analyses were performed with SAS v.9.4 (The SAS Institute, Cary, NC).

3. Results

Demographics of participating centers and center directors are shown in Table 1. Centers were generally well-established, having been in business for 17 years, on average, and most were privately owned (66.2%). Centers enrolled, on average, 58 children and employed 13 staff. Centers were of high quality, with an average rating of 4.3 ± 0.7 stars out of 5 (where a higher number of stars indicates greater compliance with state specified quality standards). Most centers accepted child care subsidies (97.3%) and participated in the Child and Adult Care Food Program (84.7%). Center directors were, on average, 46.0 ± 11.1 years old and predominately female (98.7%). Most centers directors were either white (43.2%) or African American (50.0%). Half of center directors had either a bachelor's degree or higher.

Table 1
Demographics of 74 Center and Center Director, North Carolina, 2015–2016.

	Full Sample (n = 74)		
	n	Mean/%	SD[1]
Child Care Center Characteristics			
Years in operation (Mean, SD)	74	17.4	11.3
Enrollment fees ($/week, Mean, SD)	74	140.32	19.5
Affiliation (%)[2]			
Privately owned	49	66.2	
Faith-based	20	27.0	
NC Pre-Kindergarten	20	27.0	
Early Head Start	1	1.4	
Size			
# of children (Mean, SD)	74	58.4	33.5
# of employees (Mean, SD)	74	12.7	8.4
Star rating (Mean, SD)[3]	67	4.3	0.7
NAEYC accredited (%)	11	14.9	
Accepts child care subsidies (%)	72	97.3	
Participates in CACFP[4] (%)	61	82.4	
Center Director Characteristics			
Age (years, Mean, SD)	74	46.0	11.1
Female (%)	73	98.7	
Race and ethnicity (%)			
Non-Hispanic White	32	43.2	
Non-Hispanic Black	37	50.0	
Non-Hispanic Other	3	4.1	
Hispanic	2	2.7	
Highest level of education (%)			
High school diploma/GED	1	1.4	
Some college	14	18.9	
Associate's degree	22	29.7	
Bachelor's degree	29	39.2	
Graduate, MS, or higher	8	10.8	

1: SD = standard deviation.
2: Affiliation item allowed directors to mark all that apply; 17 marked multiple affiliations, 2 were missing responses.
3: Religious-sponsored centers have the option to be exempt from star rating, n = 7 centers.
4: CACFP = Child and Adult Care Food Program.

Workplace Health and Safety Assessment Scores are shown in Table 2 (item-level data is presented in Supplemental Materials). Total scores on the Workplace Health and Safety Assessment can potentially range from 0 to 154. Actual scores ranged from 19 to 78 and averaged 41.3 ± 12.6. Low scores were observed across all domains.

On average, centers scored 9.5 ± 3.9 out of 27 on Infrastructure, earning only 36% of the potential points for this domain. Among the Infrastructure items, data showed that most center directors rated health and safety programs as very important (69% and 85%, respectively, rated importance as a 9 + out of 10). However, staff interest in health and safety programs was perceived as slightly lower (22% and 45%, respectively, rated interest as a 9 + out of 10). Most centers had at least one person identified as being responsible for health and safety programs (58% relied on an individual, 15% had a group or committee), but these individuals spent less than an hour per week on these duties in most cases (61%). Very few (11%) reported having a budget to support these efforts. Few (23%) had goals or action plans to guide their efforts. Also, assessment of staff interest (3%) or effectiveness (14%) was minimal. Communication to staff about health and safety opportunities and supports was also largely lacking with the most popular

Table 2
Workplace Health and Safety Assessment scores from 74 Centers, North Carolina, 2015–2016.

	Possible Range	Mean	SD[1]	Median	Min	Max	Alpha[2]
Total Score	154	41.3	12.6	38.5	19.0	78.0	0.78
Domain Scores							
Infrastructure	0–27	9.5	3.9	10.0	2.0	17.0	0.69
Organizational Policies and Procedures	0–35	11.1	3.9	11.0	2.0	21.0	0.71
Programs and Promotions	0–65	7.6	5.4	6.0	1.0	23.0	0.81
Internal Physical Environment	0–27	13.1	2.2	13.0	6.0	18.0	0.47

1: SD = standard deviation.
2: Alpha represents Internal Consistency KR-20.

Table 3
Correlation matrix of Workplace Health and Safety Assessment domain scores.

Domain	1	2	3	4
1. Infrastructure	1.00			
2. Organizational policies and procedures	0.62**	1.00		
3. Programs and promotions	0.79**	0.62**	1.00	
4. Internal physical environment	0.22	0.23*	0.24*	1.00

*p < 0.05; **p < 0.0001.

channel being announcements at staff meetings (35%). Half of centers reported partnering with various community groups to offer health and safety resources to staff, most commonly community organizations (e.g., Wellness Councils, Chamber of Commerce). Interestingly, few reported partnering with their local health department (12%) or hospital/health care providers (3%).

For Organizational Policies and Procedures, centers scored, on average 11.1 ± 3.9 out of 35, which represents only 32% of potential points. Organizational Policies and Procedures items showed that most of these supports were directed toward safety. For example, many centers provided training on first aid (97%), avoiding infectious hazards (50%, e.g., flu, illnesses, viruses), preventing physical injuries (41%, e.g., falls, back strain), and avoiding exposure to chemical or physical hazards (39%). Further, most centers reported having an emergency response plan (89%) and a system for reporting injuries or illnesses (62%). Additionally, nutrition supports were frequently reported in policies. Most (92%) centers allowed staff to eat meals and/or snacks served to children, liking improving access to healthy foods at the workplace given that most centers participated in the Child and Adult Care Food program, a federal nutrition assistance program that sets requirements for food served based on the Dietary Guidelines for Americans (U.S. Department of Health, 2020). Additionally, 58% of centers offered healthy foods at meetings and other center events. Few centers had policies and procedure supports for physical activity or other health behaviors.

Centers appeared to offer the least in terms of Programs and Promotions overall, scoring only 7.6 ± 5.4 out of 65, or 12% of potential points. Most of the supports offered were directed toward safety. Many centers offered programs (e.g., meetings, classes, activities) on preventing illnesses (41%), avoiding physical injuries (34%), and reducing exposure to hazards (26%). Some centers offered programs on stress management (19%) and healthy eating (18%), but other health promotion topics were largely absent. Providing educational materials (e.g., paper or electronic information) was reported less often across all health and safety topics compared to offering programs. As noted earlier, 50% of centers reported partnering with community organizations to offer health and safety resources. The most common topic addressed through these partnerships was illness prevention (41% of those indicating use of community organizations), while the remaining health and safety topics were rarely addressed.

Centers appeared to offer the most in terms of the Internal Physical Environment, scoring 13.1 ± 2.2 out of 27 or 49% of the potential score. Almost all centers provided accommodations to promote workplace safety such as adult height changing tables (97%), ramp up to changing tables (78%), and carts to transport heavy objects (77%). While data collectors were prompted to look for hazards, no concerns were noted for inadequate ventilation, inadequate lighting, wet floors, or cluttered hallways in any centers. Most centers also provided basic supports for staff meal preparation, such as a refrigerator (91%), microwave (89%), dedicated space for breaks (89%), and food preparation area (70%). Physical activity supports were less common, but 29% of center directors reported that they had a space for working out or being active that staff could use. However, data collectors noted exercise space being present in 18% of centers, which may reflect different perceptions about the potential to use children's play areas for adult exercise.

Internal reliabilities of the four domain scores are shown in Table 2 and correlations between domain scores are shown in Table 3. Generally, KR-20 suggested adequate internal reliability. Internal Physical Environment had a lower alpha (0.47), which was likely due to the extremely low variability of some items (i.e., internal physical environment around physical activity and other health behaviors) and combining items that were conceptually similar but were not associated with each other (e.g., providing space and equipment to exercise vs providing water fountains/dispensers and clearly labeled food). Correlations varied widely. Infrastructure, Organizational Policies and Procedures, and Program and Promotions were highly correlated, ranging from 0.62 to 0.79; although still below the 0.80 threshold that would suggest problems with multicollinearity between domains (O'Brien, 2007). Conversely, Internal Physical Environment was poorly correlated with other domains, ranging from 0.22 to 0.24.

4. Discussion

The Workplace Health and Safety Assessment is a useful tool for examining the health and safety supports provided by child care centers. Scores across all four domains—Infrastructure, Policies and Procedures, Programs, and Internal Physical Environment—were low, indicating that few supports are offered in child care centers. These results affirm the need for initiatives supporting child care centers' adoption of more comprehensive efforts to support workers' health and safety.

The lack of comprehensive supports for health and safety is not surprising since most child care centers have little capacity for such initiatives given their financial and human resources limitations (Donoghue, 2017). Operating expenses required to meet child-to-staff ratios leave little room for profit let alone reinvestment in health and safety supports. In addition, the average child care center employs only 12 staff, making it difficult to offer comprehensive, cost-efficient initiatives. National data show that extremely small workplaces (10–24 employees) are less likely to offer any type of health promotion program (39% of small workplaces vs. 46% overall) (Centers for Disease Control and Prevention, 2017) because of their limited capacity and resources (Taylor et al., 2016; Nelson et al., 2015; Harris et al., 2014; McCoy et al., 2014). The low Infrastructure scores observed in this study suggest that child care centers may experience even more severe

challenges compared to other small workplace settings. While 73% of centers in this study had at least one person designated to be responsible for health and safety efforts, only 11% had any budget. In comparison, national data suggest that 69% of small workplaces have at least one person designated as responsible and 62% have some level of funding to support these efforts (Centers for Disease Control and Prevention, 2019). Worksites with a designated person are nearly 10 times as likely to have a comprehensive workplace health and safety program (Centers for Disease Control and Prevention, 2019), thus demonstrating the importance of basic infrastructure support. While center directors in this study recognized that workplace health and safety is important; our results suggest that most of centers' efforts are directed toward safety issues.

Item-specific responses from domains of Organizational Policies and Procedures, as well as Programs and Promotions, illustrate that centers are directing more attention to workplace safety issues than health behaviors. These trends are expected given that federal child care law (which North Carolina has incorporated into state regulations) requires specific health and safety trainings for child care workers, including topics on prevention and control of infectious diseases; building and physical premise safety (e.g., electrical hazards, bodies of water); and handling, storage, and disposal of hazardous materials (Office of Child Care (OCC)). While these topics are important to protect the wellbeing of children, they also represent common hazards for child care workers (Bright and Calabro, 1999).

The attention to safety concerns may be a valuable leverage point through which to launch additional health promotion programming (Linnan et al., 2019), consistent with the Total Worker Health approach (National Institute for Occupational Safety and Health, 2012). Traditionally, occupational health and safety programs and health promotion programs were viewed as distinct initiatives. The Total Worker Health approach breaks down these siloes of independent focus and promotes "policies, programs, and practices that integrate protection from work-related safety and health hazards with promotion of injury and illness prevention efforts to advance worker wellbeing" (National Institute for Occupational Safety and Health, 2018). Our results show that child care centers focus on required safety topics; however, preventing work-related illnesses and injuries and promoting healthy lifestyles are also important to workers' wellbeing. Health promotion is particularly important among low-wage earners like child care workers given the prevalence of unhealthy behaviors (Otten et al., 2019; Ward et al., 2018), increased risk for chronic diseases (Linnan et al., 2017; Otten et al., 2019; Whitaker et al., 2013), and limited access to preventive care (Stiehl et al., 2018). The integration of safety and health may also promote increased participation in workplace health promotion programs as well as improved health outcomes (National Institute for Occupational Safety and Health, 2012; Sorensen et al., 2002).

Another particularly relevant component of Total Worker Health is a recognition of work as a social determinant of health, acknowledging that wages, hours, workload, scheduling, psychosocial stressors, and leave policies also impact worker' wellbeing (Centers for Disease Control and Prevention, 2018). Addressing these issues as part of a comprehensive effort is particularly important for child care workers who, as low-wage earners, are more likely to encounter low pay, involuntary overtime, long hours and inflexible scheduling, limited or no access to health insurance, and high demand-low control over decisions at work (Baron et al., 2014). These working conditions may, in turn, limit employee access, free time, and/or ability to participate in regular physical activity or prepare healthy meals, while also increasing their likelihood of smoking, alcohol use, and unhealthy eating habits (Baron et al., 2014). The Workplace Health and Safety Assessment used in this study assessed the availability of supports to help child care workers address some, but not all, of these issues. Unfortunately, few of these supports were available. Some of the more common supports for financial health, albeit still limited, were offering health insurance (34%), retirement savings programs (26%), or direct deposit into savings (18%). Almost no centers offered programs or educational materials on personal financial health (only 5% and 7%, respectively) for these low-wage workers. When prompted about occupational safety and health, some centers (26%) noted that they offered trainings on reducing psychosocial stressors (e.g., emotional demands, inadequate staffing, lack of managerial/coworker support); however, far fewer centers reported offering programs and educational materials on stress management (11% offered programs, 4% offered educational materials).

5. Study strengths and limitations

Strengths of this study include its focus on a workplace that employs primarily low-wage workers, the thorough assessment of the available supports for health and safety, and the use of a combination of structured interviews and observations to collect the data. However, the study also had some limitations. The Workplace Health and Safety Assessment is a new instrument. However, creation of a new instrument was important to ensure its relevance to child care centers, and its development was guided by widely used tools (e.g. CDC Worksite ScoreCard). In addition, final scales were assessed for internal consistency. The scoring rubric was relatively simple and did not incorporate any weighting of individual items. Ideally, weighting would be based on the strength of evidence for the effectiveness of different strategies or activities, but data are not available yet to inform such weighting. The sample used for this study came from a larger randomized control trial; hence the participating centers may represent more high-functioning or motivated centers. The sample also came from North Carolina (NC). For these reasons, caution is warranted regarding the generalizability of these findings beyond NC.

6. Conclusions

Child care workers' health and safety are at risk, yet their workplaces offer few supports that encourage healthy lifestyle choices and protect against the range of workplace hazards that threaten their wellbeing. Fortunately, center directors recognize and appear to value the health and safety of their workers. Most of their efforts, however, are directed toward occupational health and safety issues and not working conditions or health promotion. Child care centers and their workers could benefit greatly from more comprehensive programs that use a Total Worker Health approach. Future research should examine practical strategies for expanding workplace supports for health and safety that are feasible within the limited capacity and resources of child care centers.

Funding

This work was supported by the National Heart, Lung and Blood Institute [grant number R01-HL119568, 2014–2019]; the Centers for Disease Control and Prevention [grant number U48-DP005017, 2014–2019; grant number U48-DP006400, 2019–2024]. Findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the National Heart, Lung and Blood Institute or the Centers for Disease Control and Prevention.

CRediT authorship contribution statement

Amber E. Vaughn: Conceptualization, Methodology, Investigation, Data curation, Writing - original draft, Funding acquisition. **Erik A. Willis:** Methodology, Formal analysis, Data curation, Writing - review & editing. **Dianne S. Ward:** Conceptualization, Investigation, Writing - review & editing, Supervision, Funding acquisition. **Falon Smith:** Investigation, Data curation, Writing - review & editing, Project administration. **Anna Grummon:** Conceptualization, Methodology, Investigation, Data curation, Writing - review & editing. **Laura A.**

Linnan: Conceptualization, Investigation, Writing - review & editing, Supervision, Funding acquisition.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

We would like to thank Lori Bateman and Natalie Smith for their contributions to this effort as the Project Manager and Data Manager, respectively. We would also like to thank the center and center directors that participated in this study.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.pmedr.2020.101154.

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