

Workforce well-being: Personal and workplace contributions to early educators' depression across settings[☆]

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ABSTRACT

Building on research demonstrating the importance of teachers' well-being, this study examined personal and contextual factors related to early childhood educators' ($n = 1640$) depressive symptoms across licensed child care homes, centers, and schools. Aspects of teachers' beliefs, economic status, and work-related stress were explored, and components of each emerged as significant in an OLS regression. After controlling for demographics and setting, teachers with more adult-centered beliefs, lower wages, multiple jobs, no health insurance, more workplace demands, and fewer work-related resources, had more depressive symptoms. Adult-centered beliefs were more closely associated with depression for teachers working in home-based settings compared to center-based settings. These findings provide preliminary evidence about what relates to depression in the early childhood workforce, which has implications for supporting well-being across settings.

1. Introduction

Early childhood, the developmental period spanning birth to age eight years, is characterized by rapid maturation and change, and is impacted by children's early environments, interactions, and experiences (Fusaro & Nelson, 2009; Shonkoff & Phillips, 2000). Since over 11 million children under age five experience non-parental care and education in the United States (Laughlin, 2013), early childhood educators are important contributors to children's learning and development. In particular, teachers' sensitive, supportive, and stimulating interactions with children provide strong foundations for children's future success (Hamre & Pianta, 2001; Mashburn et al., 2008). Teachers experiencing depression, however, are less likely to provide emotionally supportive and cognitively stimulating interactions (Hamre & Pianta, 2004; McLean & Connor, 2015; Sandilos et al., 2015), with potentially negative implications for children's development (Roberts, LoCasale-Crouch, Hamre, & DeCoster, 2016; Jeon, Buettner, & Snyder, 2014; McLean & Connor, 2015). Given that early childhood teachers often experience low pay and stressful situations, it is plausible that early childhood working conditions may be insufficient to support teachers' well-being (Li-Grining et al., 2010; Whitebook, Phillips, & Howes,

2014). However, little is known about specific personal and contextual factors that may relate to teachers' depression. Furthermore, since young children experience various care and education settings (Institute of Medicine [IOM] & National Research Council [NRC], 2015; Laughlin, 2013; National Survey of Early Care and Education Project Team, 2016), it is important to understand teachers' depression across settings. Thus, the goal of this study is twofold: to determine how teachers' beliefs, economic status, and work-related stress, are associated with their depressive symptoms, and to determine the extent to which these associations vary by setting.

1.1. The importance of teacher well-being

In the quest to determine what makes teachers most effective, teacher well-being has emerged as an important component (IOM & NRC, 2015). Well-being is a broad, multi-dimensional concept; "well-being, in short, is about flourishing" (Lovewell, 2012, p. xi). The prosocial classroom model (Jennings & Greenberg, 2009) posits that teachers' well-being and social emotional competence contribute to the quality of teacher-child relationships and the creation of healthy classroom environments, which subsequently relate to students' social, emotional,

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and academic outcomes. Similarly, a recent report by the Institute of Medicine (IOM) and the National Research Council (NRC) (2015) places teachers' well-being at the center of a proposed model for transforming the early childhood workforce, asserting that early childhood practitioners' well-being is a result of high quality professional learning supports, leadership competencies, practitioner knowledge and competencies, and working conditions. Subsequently, practitioner well-being is associated with practice behavior and relationships with children, families and other professionals, which are most proximal to children's outcomes. This model, newly articulated, is fundamental to many experts' vision of high quality early care and education (IOM & NRC, 2015). One important aspect of teachers' well-being, documented in the literature, is depressive symptomatology (e.g., Jennings, 2014).

1.2. A focus on teacher depression

Depression is a mood disorder characterized by feelings of hopelessness, irritability, decreased energy, and trouble concentrating, although symptoms manifest differently across individuals (American Psychiatric Association, 2013). One of the most common mental health conditions, depression affects more than sixteen million adults in the United States annually (National Institute of Mental Health, 2017). Estimates of depression among early childhood educators vary greatly. In a systematic review of home-based and center-based providers' well-being from 1980 to 2012, clinical depression ranged from 6% to 27% across four studies (Corr, Davis, LaMontagne, Waters, & Steele, 2014). More recently, Whitaker, Becker, Herman, and Gooze (2013) estimated that nearly a quarter of surveyed Head Start teachers in Pennsylvania reported symptoms consistent with clinical depression. Privacy issues, stigma, selection bias, and various other constraints make it difficult to estimate the "true" incidence of depression among early childhood educators nationally (Li & Sung, 1999). Nevertheless, evidence is mounting to suggest a myriad of potential detriments for early childhood teachers with depressive symptoms.

In the Pennsylvania Head Start sample, staff experiencing higher levels of depression reported more absences from work and days worked while physically and/or mentally unhealthy (Whitaker et al., 2013). Depressed teachers from the same sample reported poorer relationships with children, marked by more conflict and less closeness (Whitaker, Dearth-Wesley, & Gooze, 2015). Even in samples with lower rates of clinical depression (i.e., < 10%), depressive symptoms were negatively associated with teacher-child interactions and children's outcomes (e.g., Roberts et al., 2016; Hamre & Pianta, 2004). Teachers who reported more depressive symptoms demonstrated less sensitive and more withdrawn interactions with children (Hamre & Pianta, 2004), and exhibited lower levels of classroom quality (Jennings, 2014; Jeon et al., 2014; La Paro et al., 2009; Sandilos et al., 2015). Furthermore, teachers with more depressive symptoms were more likely to have children in their classrooms who exhibited more problem behaviors (Jeon et al., 2014) and made fewer advances in social-emotional development (Roberts et al., 2016). McLean and Connor (2015) found that third grade teachers with more depressive symptoms were less likely to create high quality learning environments, and the children in their classrooms made fewer gains in math achievement. In summary, depression may negatively affect both the teachers experiencing the symptoms, as well as the children they teach.

Early childhood working conditions, including long hours, low pay, stressful situations, and lack of support, may be insufficient to support teachers' well-being (Whitebook et al., 2014). Various studies suggest that teachers' perceptions of workplace stress are associated with burnout (Jennings & Greenberg, 2009) and turnover (Cassidy, Lower, Kintner-Duffy, Hegde, & Shim, 2011). Among the Pennsylvania Head Start Staff (Whitaker et al., 2013), perceptions of workplace stress were associated with higher levels of depression among teachers. Previous research has focused more on the characteristics associated with

teacher stress (e.g., Montgomery & Rupp, 2005), rather than characteristics associated with teacher depression (Zinsser, Christensen, & Torres, 2016). While stress may be, at times, situationally accommodating (i.e., stimulating increased arousal in response to a threat) (McGonigal, 2016; Szabo, Tache, & Somogyi, 2012), depression represents a more pervasive manifestation of emotional distress (American Psychiatric Association, 2013). As a result, the goal of the present study was to illuminate what potentially amenable characteristics relate to teachers' depressive symptoms across early childhood settings.

1.3. What relates to teacher depression?

According to the bioecological systems model (Bronfenbrenner & Morris, 2006), an individual's development is embedded in various hierarchical systems, some of which are more proximal and direct (i.e., the home or workplace), and others which are more distal (i.e., political systems or economies) (Bronfenbrenner & Morris, 2006). While all levels of systems affect an individual's development, interactions that are more proximal are most impactful. These proximal processes, the activities of daily living, are the "engines" that drive development (Bronfenbrenner & Morris, 1998). In other words, over time, our development and well-being are most determined by the quality of our interactions in our close, daily relationships. In the current study, we considered how multiple systemic levels: personal characteristics of teachers (their beliefs about supporting children's development and their economic stability), contexts of the workplace (perceptions of stress), and macro/societal factors (professional compensation, public assistance, and health insurance status) were associated with teachers' symptoms of depression. As a known antagonist to well-being in the context of personal interactions, we could expect that depression would disrupt the quality of teachers' proximal processes, and, among other difficulties, interfere with relationships and teaching quality.

1.3.1. Beliefs about children

Beliefs about children's development are indicators of teacher quality (Hur, Buettner, & Jeon, 2015) and have been examined in relation to teacher practices, child outcomes, workplace climate and well-being (Burchinal & Cryer, 2003; Hur, Jeon, & Buettner, 2016; Pianta et al., 2005). Teachers who hold more traditional, adult-centered views tend to believe that children learn passively, require direct instruction, and should be obedient to authority figures. In contrast, teachers who hold more progressive, child-centered views tend to believe children learn best by actively exploring and should be allowed to express their own viewpoints (Schaefer & Edgerton, 1985). In a variety of early childhood settings, teachers who espoused child-centered beliefs demonstrated higher quality interactions with children (Clarke-Stewart, Vandell, Burchinal, O'Brien, & McCartney, 2002; La Paro et al., 2009; Pianta et al., 2005) and had students who demonstrated higher achievement (Forry et al., 2013) and more positive behavioral outcomes (Hur et al., 2015). Conversely, children with teachers who held more adult-centered beliefs had poorer developmental outcomes (i.e., Clarke-Stewart et al., 2002). However, to our knowledge, beliefs about children have not been extensively studied in relation to teachers' depressive symptoms. Although not the main focus of the study, Pianta et al. (2005) found that teachers' adult-centered beliefs were significantly and positively related to depression. Thus, we hypothesize that more adult-centered beliefs will relate to more depressive symptoms in the present study.

1.3.2. Economic status

Despite the proven importance of high-quality early childhood experiences for positive development, early childhood teachers are among the poorest compensated professionals (U.S. Department of Health and Human Services & U.S. Department of Education, 2016; Whitebook

et al., 2014). Drawing on national data from the Bureau of Labor Statistics, Whitebook et al. (2014) found child care workers ranked in the 3rd percentile for average earnings of all occupations; preschool teachers ranked in the 19th percentile, and kindergarten teachers ranked in the 60th percentile. It is relevant to consider how economic status may associate with teachers' depression, based on studies suggesting that economic stress can negatively impact individuals' physical and mental health (Conger, Ge, Elder, Lorenz, & Simons, 1994; Dunlop, Song, Lyons, Manheim, & Chang, 2003; Everson, Maty, Lynch, & Kaplan, 2002). In addition, economic factors are often a primary cause for teacher turnover (Phillips, Mekos, Scarr, McCartney, & Abbott-Shim, 2000). Among a group of preschool teachers in North Carolina, low salary and poor benefits were cited as the most common reasons for leaving the early childhood field (Cassidy et al., 2011). Whitebook and Sakai (2004) found that early childhood teachers who earned less than \$12.70 an hour were more likely to be depressed than teachers earning more than \$14.83. Furthermore, after accounting for various demographic and economic characteristics, lack of health insurance was strongly related to depression in a demographically diverse national sample of the general population (Dunlop et al., 2003). In the aforementioned study, individuals with lower salaries were more prone to depression, but not when other demographic and economic characteristics were considered (Dunlop et al., 2003).

Utilization of public assistance is another economic factor that has been linked to depressive symptoms. In a review of welfare-to-work studies, between 25 and 57% of sampled individuals reported high levels of depressive symptoms (Lennon, Blome, & English, 2001). Qualifying for public assistance, due to financial insecurity or disability, for instance, may lead individuals to feel depressed (Leung, Epel, Willett, Rimm, & Laraia, 2015). However, receiving supplemental assistance may also alleviate some challenges, leading individuals to feel less depressed (Munger, Hofferth, & Grutzmacher, 2016). Ultimately, the association between public assistance and depressive symptoms among early childhood educators is unclear and will be examined in the present study. Lastly, no known studies have considered the association between teachers taking multiple jobs and their experience of depression. Consistent with the notion that the need to secure multiple jobs may represent a financial burden, it is possible that having multiple jobs may increase depressive symptoms. Therefore, the present study will consider how insurance status, pay, public assistance use, and having multiple jobs relate to teachers' depression.

1.3.3. Work-related stress

Research suggests that early childhood teachers experience a lot of stress in the workplace (Curbow, Spratt, Ungaretti, McDonnell, & Breckler, 2000; Li-Grining et al., 2010). Workplace stress can impact one's effectiveness (Karasek & Theorell, 1990). Since building relationships is a key aspect of early childhood teachers' jobs (Hyson & Biggar, 2006), it is not surprising that workplace stress is associated with poorer quality relationships with children (Whitaker et al., 2015). Among the Pennsylvania Head Start staff, workplace stress and depression were positively associated; and demands and overall stress were associated with poorer relationships, even beyond the effects of teachers' depression (Whitaker et al., 2015). Work-related stress may include inordinate *demands*, feelings of inadequate *control* over one's work, and lack of perceived *resources*, which encompasses a lack of respect, influence, or satisfaction by one's work (Curbow et al., 2000). These components of stress are commonly experienced by early childhood teachers (Curbow et al., 2000; Li-Grining et al., 2010; Whitaker et al., 2015). In terms of how these components of stress relate to depression, a study of caregivers of children in orphanages in the Ukraine found that lack of resources related positively to depression; feelings of autonomy or control did not relate to depression in that study (Raskin, Kotake, Easterbrooks, Ebert, & Miller, 2015). Similarly, Curbow, McDonnell, Spratt, Griffin, and Agnew (2003) found that lack of resources was most highly associated with early childhood teachers'

depression. Teachers' feelings of control did not significantly relate to depression when demands and resources were in the model; however, the model did not include covariates (Curbow et al., 2003). Overall, more research is needed to identify how work-related stress relates to teachers' depression in early childhood settings.

1.4. Exploring setting differences

Early care and education is provided in a variety of settings, including family child care homes, center-based programs, and elementary schools. In a family child care home, one or more individuals provide child care to one or several children in the provider's home. In center-based child care, children are often separated into classrooms by age. In the context of child care and education licensing, all of these settings are required to observe specific group sizes, adult/child ratios, and staff education and training (IOM & NRC, 2015). Over the course of the early years, most children experience at least one of these settings; many children experience more than one, sequentially and sometimes simultaneously (Laughlin, 2013; National Survey of Early Care and Education Project Team, 2016). In a common scenario, a child may attend a family child care home for her first two years, a center-based preschool from 3 to 4 years of age, and an elementary school for pre-kindergarten through third grade.

These settings vary dramatically in what they offer and expect of teachers, including educational attainment, working conditions, compensation and benefits. Teachers in elementary schools, both Pre-K and K-3 teachers, usually hold bachelor's degrees; teachers in public schools are typically credentialed by their state agencies. While the educational attainment of licensed home-based and center-based providers is variable (Epstein & Barnett, 2012), studies suggest that center-based teachers tend to have higher educational attainment than home-based providers (Dowsett, Huston, Imes, & Gennetian, 2008). Driven largely by differences in organization, funding, and educational requirements, elementary school teachers (K-3) tend to receive significantly greater compensation than Pre-K teachers and teachers working in licensed homes and child care centers (Whitebook et al., 2014). Notably, the "pay gap" between Pre-K and K-3 in public elementary school teachers has narrowed in recent years, with the increase in publicly funded Pre-K (Epstein & Barnett, 2012). Although education and compensation may be easily identifiable differences, early childhood settings also vary in other, more nuanced ways. For instance, home-based providers have been shown to hold more adult-centered beliefs than center-based teachers (Dowsett et al., 2008). Overall, most studies in early care and education tend to concentrate on specific settings (i.e., exclusively Head Start or elementary schools), which may limit broad policy implications. Furthermore, this fragmentation in research, policy, and practice poses challenges to understanding and improving the field at large (Goffin, 2015). To address this issue, the present study will explore what characteristics relate to depression across several early childhood settings, and estimate the extent to which associations vary by setting.

1.5. Present study

Numerous studies have shown that teachers' depressive symptoms may negatively impact the quality of classroom interactions and instruction, which may hinder children's social and academic development. Few studies have explored what personal characteristics are related to teachers' depression, especially across early childhood settings. Therefore, the present study is guided by the following research questions:

1. What characteristics, including beliefs, economic status, and work-related stress, relate to early childhood educators' depressive symptoms?
2. To what extent do associations among beliefs, economic status, work-related stress, and depressive symptoms vary by setting?

(home-based, center-based, Pre-K, and K-3)?

2. Method

This study utilized data from a large statewide survey of early childhood educators in a Midwestern state. For sampling purposes, the state was divided into six regions and stratified random samples were derived from each region. Licensed home-based and center-based providers were identified from state licensing lists; elementary schools were identified from the state's department of education. Permission to distribute surveys was granted by individual districts; all but one district agreed to participate. Half of all home-based providers, center-based providers, and elementary schools without Pre-K were randomly sampled; all schools with Pre-K were sampled. In this study, Pre-K was defined as state-funded programs connected to school systems serving 3- and 4-year olds. Data collection occurred from 2015 to 2016.

In centers and elementary schools, directors or principals were invited to complete a survey (via mail) about themselves and their school/center; they were also asked to distribute one survey to the lead teacher in each age group or grade level represented in the program or school (through third grade.) To reduce selection bias, if schools/centers had more than one classroom per age/grade level, administrators were instructed to have the lead teacher with the next birthday complete the survey. Home-based providers received a combined program and teacher survey under the assumption that they served as both directors and lead teachers. Surveys were created to gather information about programs, classrooms, and individuals; surveys were similar yet distinct across settings. Data for the present study come from home-based, center-based, Pre-K, and K-3 teacher surveys. Response rates were 38% for home-based, 67% for Pre-K, and 56% for K-3; response rates were not calculated for center-based due to the lack of information regarding how many teachers were employed in each center.

The present sample consists of 1640 educators within 1063 schools or centers. Thirty-six percent ($n = 594$) of teachers taught grades K-3 in elementary school settings, 25% ($n = 403$) were licensed home-based providers, 23% ($n = 371$) were in licensed centers, and 17% ($n = 272$) were Pre-K teachers in elementary schools. Consistent with the demographics of the workforce in the state, most teachers were female (97.8%) and white (94.9%). On average, teachers were 41.90 years old ($SD = 12.60$) and had 15.56 years of experience working with children ($SD = 10.52$). In terms of highest educational attainment, 19.8% of teachers had a high school diploma or GED, 9.9% had an associate's degree, 42.5% had a bachelor's degree, and 27.7% had a graduate degree.

Table 1 provides the demographic characteristics of teachers by setting. Analysis of variance with Bonferroni corrections were used to test for demographic differences. Center-based teachers were more racially and ethnically diverse than teachers in all other settings, $F(3, 1555) = 25.13$, $p < 0.001$. Home-based providers were older than teachers in all other settings; K-3 teachers were older than Pre-K and center-based teachers, $F(3, 1581) = 66.99$, $p < 0.001$. Home-based providers were less likely to have a bachelors or graduate degree than teachers in all other settings. Center-based teachers were less likely to have a bachelors or graduate degree than Pre-K and K-3 teachers, $F(3, 1557) = 27.20$, $p < 0.001$. There were no gender differences across settings, $F(3, 1602) = 2.29$, $p = 0.08$.

2.1. Measures

All measures were collected via teacher-reported surveys. Descriptive statistics, by setting, are provided at the bottom of Table 1.

2.1.1. Beliefs about children

Beliefs about children were measured using the Parent Modernity Scale (Schaefer & Edgerton, 1985) which has been used to capture teachers' beliefs (e.g., Clarke-Stewart et al., 2002; Pianta et al., 2005).

The scale measures whether respondents have more traditional/adult-centered views of caring for and educating children, or more progressive/child-centered views. Teachers responded to 15 items on a 5-point scale where 1 = strongly disagree and 5 = strongly agree. An example of a more adult-centered item is "Children must be carefully trained early in life or their natural impulses will make them unmanageable" and an example of a more child-centered item is "Children learn best by doing things themselves rather than listening to others." Child-centered items were reversed and all items were summed so that higher scores reflect more adult-centered views of children ($\alpha = 0.78$).

2.1.2. Economic characteristics

Insurance status was estimated by asking teachers whether they currently have health insurance for their families from any source. The variable was coded such that 1 = yes. Earnings were captured through self-reported salaries or wages. Teachers were given the option to report their earnings per hour, per week, per month, or per year. If teachers chose to report per hour, this number was used to represent hourly wage. If teachers chose to report in any other metric, hourly wage was calculated by utilizing teachers' reports of hours worked per week and/or months worked per year. Teachers use of public assistance was captured by asking teachers to endorse whether they currently receive any of following benefits: Medicaid or Medicare (adults), Medicaid/CHIP (children), food stamps, WIC, TANF, free or reduced price school lunches for your own children, child care subsidy, public housing, section 8 housing voucher, social security payments, disability (SSI) for yourself, or disability (SSI) for a family member. A variable was created to represent if the teacher receives any type of public assistance where, 1 = yes. To measure whether teachers had multiple jobs, they were asked if they currently have another paid job in addition to their job as a child care/elementary school teacher (1 = yes.)

2.1.3. Work-related stress

Work-related stress was measured using an abbreviated version of the Child Care Worker Job Stress Inventory (Curbow et al., 2000). The inventory consists of three subscales which include work-related control, work-related demands, and work-related resources. The control subscale captures the extent to which teachers believe they have autonomy and control over characteristics of the workplace, including the organization of the classroom, the availability of supplies, and parents' responsiveness. The demands subscale captures workplace challenges, such as parents' blame or lack of communication and children's behavior problems or needs. The resources subscale captures teachers' perceived resources, such as feeling respected, influential, and satisfied by their work. Each subscale consisted of 5 items. The demands and resources subscales were measured on a 5-point scale where 1 = never and 5 = most of the time. The control subscale was measured on a 5-point scale where 1 = very little and 5 = very much. All subscales demonstrated adequate internal consistency (control $\alpha = 0.71$; demands $\alpha = 0.66$; resources $\alpha = 0.75$). Construct validity was previously demonstrated for all subscales (Curbow et al., 2000).

2.1.4. Depressive symptoms

Depressive symptoms were captured using the Center for Epidemiologic Studies Depression scale, 10 item version (CESD-10; Radloff, 1977). Teachers reported the frequency of the depressive symptoms they experienced in the past week using a 4 point scale where 0 = rarely or none of the time and 3 = all the time. Sample items include "I felt that everything I did was an effort" and "I felt lonely." Positive items were reversed scored and all items were added so that higher scores indicate more depressive symptoms. Although not an official diagnosis, scores above 10 indicate clinical depression. ($\alpha = 0.70$). The CES-D has demonstrated good reliability and construct validity in samples of middle aged women (Knight, Williams, McGee, & Olaman, 1997) and older adults (Irwin, Artin, & Oxman, 1999). In the present study, the terms depression and depressive

Table 1
Demographic characteristics & descriptive statistics for main study variables by setting.

Variable	All		Home-Based		Center-based		Pre-K		K-3	
	M(SD)	Range	M(SD)	Range	M(SD)	Range	M(SD)	Range	M(SD)	Range
Demographic										
Female	0.98	–	0.99	–	0.97	–	0.98	–	0.97	–
White	0.95	–	0.94	–	0.87	–	0.99	–	0.99	–
Age	41.90 (12.60)	19–78	48.41 (11.03)	23–78	36.46 (12.41)	19–66	39.39 (11.49)	23–66	42.23 (12.24)	21–71
Experience	15.55 (10.52)	0–50	18.52 (11.22)	0–50	12.09 (9.29)	0–50	14.12 (9.22)	0–43	16.55 (10.67)	0–45
H.S. Diploma	0.19	–	0.54	–	0.30	–	0.01	–	0.00	–
A.A.	0.10	–	0.21	–	0.23	–	0.01	–	0.00	–
B.A.	0.43	–	0.22	–	0.37	–	0.55	–	0.52	–
Graduate	0.28	–	0.01	–	0.09	–	0.43	–	0.48	–
Other	0.01	–	0.02	–	0.02	–	0.00	–	0.00	–
Variables										
Beliefs	23.75 (8.45)	0–48	27.18 (8.88)	0–48	24.44 (8.44)	0–46	20.25 (7.43)	1–40	22.86 (7.79)	1–45
Insurance	0.61	–	0.63	–	0.20	–	0.73	–	0.79	–
Hourly Wage	18.05 (9.74)	1–54	11.88 (9.94)	1–53	11.65 (3.99)	5–34	21.95 (8.02)	6–46	23.89 (8.12)	3–49
Assistance	0.16	–	0.27	–	0.22	–	0.10	–	0.08	–
Multiple Jobs	0.17	–	0.12	–	0.19	–	0.20	–	0.19	–
Control	3.24 (0.98)	1–5	4.39 (0.65)	1–5	2.94 (0.82)	1–5	3.12 (0.76)	1–5	2.71 (0.67)	1–5
Demands	2.75 (0.64)	1–5	2.57 (0.68)	1–5	2.72 (0.65)	1–5	2.69 (0.60)	1–4	2.93 (0.60)	1–5
Resources	4.03 (0.62)	1–5	4.16 (0.68)	1–5	4.00 (0.68)	1–5	4.13 (0.52)	3–5	3.91 (0.56)	2–5
Depression	4.35 (3.66)	0–24	3.71 (3.76)	0–20	5.18 (3.68)	0–23	4.38 (3.74)	0–24	4.26 (3.46)	0–19

Note: Standard deviations and ranges are not reported for dichotomous variables; ranges have been rounded.
H.S. = High School A.A. = Associate's degree B.A. = Bachelor's degree Graduate = Graduate degree

symptoms are used interchangeably.

2.1.5. *Covariates*

Motivated by past research identifying demographic differences in rates of depression (Akhtar-Danesh & Landeen, 2007; Dunlop et al., 2003; Pratt & Brody, 2015; Probst et al., 2006), the present study controlled for race, educational attainment, age, and urbanicity.

Teachers' ethnicity and race were self-reported. Due to low variability, an indicator variable was created to capture whether or not the teacher was white. Teachers listed all degrees attained and in progress. This information was used to create a variable representing highest educational attainment, which, for the purpose of this study, was re-coded such that one indicates having a bachelor's or graduate degree. Age was reported as a continuous variable, in years. Teachers reported the counties or school districts where they worked. Counties with populations of 50,000 or more were considered urban.

2.2. *Analytic plan*

First, bivariate correlations and descriptive statistics were examined. Then, for all teachers, depression was regressed on adult-centered beliefs, insurance status, hourly wage, public assistance use, whether the teacher had multiple jobs, work-related stress (demands, control, resources), demographic covariates, and setting type. Setting was dummy coded with K-3 withheld as the reference group. Moderation analyses were conducted through a series of multiple linear regressions. Interaction terms were created between dummy-coded setting variables and beliefs, economic indicators, and stress.

2.2.1. *Missing data*

Variables with missing data included beliefs about children (8%), insurance status (5%), pay (12%), public assistance status (8%), multiple job status (3%), control (2%), demands (2%), resources (2%), depression (6%), race (5%), educational attainment (7%), and age (3%). All models were run using full information maximum likelihood (FIML) in Mplus Version 7.4 (Muthén & Muthén, 2015). Schools/centers were entered as clusters to remove the random variability associated with teachers nested within schools or centers. FIML assumes all data are missing at random (MAR). Although there is no test for MAR, tests were conducted to determine whether auxiliary variables not included

in the original models were related to missingness (Enders, 2010). Specifically, logistic regressions were run using dummy variables that were created for all study variables with missing data (0 = present; 1 = missing). Variables already in the model and demographic variables theoretically related to missingness were included as predictors in the logistic regressions. None of the prospective auxiliary variables predicted missingness, suggesting it was reasonable to assume data are missing at random.

3. **Results**

3.1. *Preliminary analyses*

Descriptive analyses revealed that most (86.3%) teachers, across settings, reported experiencing some depressive symptoms in the prior week (78.1% home-based, 89.9% center-based, 87.0% Pre-K, and 89.5% of K-3 teachers). However, a smaller portion of teachers (8.9%) had clinically significant depression (i.e., scores above 10) (8.0% home-based, 10.7% center-based, 9.6% Pre-K, and 7.9% of K-3 teachers). Upon further review, the outcome of interest, teachers' depressive symptoms, was moderately and positively skewed. A square root transformation was performed resulting in improved normality. The new variable, used in subsequent correlation and regression analyses, had a mean of 1.83, a standard deviation of 1.00 and ranged from 0 to 4.9.

Bivariate correlations among teachers' beliefs, economic characteristics, work stress, study covariates, and depression are shown in Table 2. The top portion of the table presents associations for the full sample of teachers. The last four rows contain the correlations for depression by setting. In the full sample, several variables were significantly correlated with teachers' depression scores; teachers' work-related stress (control, demands, and resources) were most strongly associated with teachers' depression, all in expected directions. These associations were also shown to be strong across settings. The correlation between teachers' beliefs and depression were stronger in home-based than other settings. The association between pay and depression was stronger in Pre-K and K-3 settings than home-based and center-based settings. These correlations did not suggest any multi-collinearity issues among independent variables. The intraclass correlation coefficient was 0.07 for the full sample and < 0.10 for each setting.

Table 2
Correlations among beliefs, economic characteristics, work stress, covariates, and depression.

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. Beliefs												
2. Insurance	-0.05											
3. Hourly Wage	-0.15*	0.30*										
4. Assistance	0.14*	-0.07*	-0.19*									
5. Multiple Jobs	-0.04	-0.05	0.00	0.00								
6. Control	0.17*	-0.02	-0.24*	0.12*	-0.07*							
7. Demands	0.02	0.06	0.09*	-0.02	0.05	-0.38*						
8. Resources	-0.03	-0.02	-0.01	0.05	-0.01	0.35*	-0.37*					
9. Urban	-0.07	-0.16*	-0.05	-0.03	0.00	-0.03	-0.04	0.05				
10. BA +	-0.25*	0.22*	0.46*	-0.22*	0.07	-0.37*	0.09*	-0.07*	-0.07*			
11. Age	0.05	0.12*	0.02	0.16*	-0.07*	0.25*	-0.11*	0.10*	-0.07*	-0.06		
12. White	-0.13*	0.13*	0.13*	-0.13*	0.00	-0.03	-0.01	0.00	-0.15*	0.12*	0.07*	
13. Depression	0.07*	-0.11*	-0.11*	0.00	0.09*	-0.22*	0.27*	-0.32*	0.01	0.00	-0.28*	-0.07*
Home	0.20*	-0.04	-0.10	0.09	0.10	-0.25*	0.31*	-0.37*	-0.03	-0.04	-0.14*	-0.17*
Center	0.02	-0.03	-0.11	-0.02	0.07	-0.25*	0.27*	-0.24*	0.04	-0.14	-0.28*	0.00
PK	0.07	-0.15	-0.24*	0.00	0.14	-0.23*	0.33*	-0.35*	0.00	-0.01	-0.30*	0.01
K-3	0.08	-0.07	-0.17*	-0.08	0.05	-0.11*	0.20*	-0.30*	-0.03	-0.01	-0.27*	-0.05

* $p < 0.01$.

3.2. Main analyses

The first question examined the extent to which adult-centered beliefs, insurance status, hourly wage, public assistance use, whether the teacher had multiple jobs, and work-related stress (demands, control, resources) were associated with depression, controlling for demographic covariates and setting. Standardized coefficients are presented in Table 3. After controlling for all other variables, teachers who held more adult-centered beliefs had more depressive symptoms. In terms of economic status, teachers who did not have insurance, had lower wages, and who held multiple jobs had more depressive symptoms. Finally, all aspects of work-related stress were significant, such that teachers who had less control, more demands, and fewer resources had more depressive symptoms. The overall model accounted for 21.3% of the variance in teachers' depression.

The second question examined whether setting moderated the relation between beliefs, economic status, and work-related stress, and depression. Following a series of multiple regressions, one significant interaction emerged. Setting moderated the association between beliefs and depression. Specifically, home-based providers significantly differed from center-based teachers on the association between wage and depression ($\beta = -0.07$, $SE = 0.03$, $p = 0.049$). As shown in Fig. 1, as child-centered

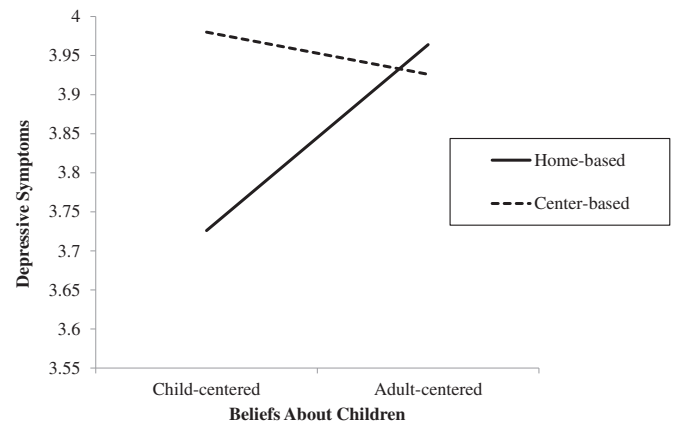


Fig. 1. An interaction is observed between beliefs and setting for depressive symptoms, suggesting that teachers with more child-centered beliefs (displayed here as 1 S.D. below the mean) had fewer depressive symptoms in home-based settings than teachers with more adult-centered beliefs (1 S.D. above the mean.) Beliefs about children appears to matter less in center-based settings. Note, depressive symptoms was transformed and should not be interpreted in its original metric.

Table 3
Standardized coefficients modeling teachers' depressive symptoms for the full sample.

Variables	β	SE	p
Beliefs			
Adult-Centered Beliefs	0.070	0.027	0.01
Economic Indicators			
Insurance Status	-0.059	0.027	0.03
Hourly Wage	-0.098	0.029	0.001
Public Assistance	-0.015	0.025	0.56
Multiple Jobs	0.061	0.022	0.01
Work-Related Stress			
Control	-0.066	0.036	0.06
Demands	0.151	0.026	< 0.001
Resources	-0.221	0.027	< 0.001
Covariates			
Urban	-0.006	0.026	0.81
BA +	-0.051	0.035	0.147
Age	-0.193	0.025	< 0.001
White	-0.029	0.024	0.22
Setting			
Home-Based	-0.049	0.047	0.30
Center-Based	-0.012	0.038	0.75
Pre-K	0.042	0.026	0.11
Overall model R ²	0.217		< 0.001

beliefs decreased (i.e., more adult-centered), the depressive symptoms of home-based providers increased. In comparison, beliefs related very little to teachers' depression scores in center-based settings.

4. Discussion

The present study explored how teachers' beliefs, economic status, and work-related stress were associated with their depressive symptoms, and the extent to which these associations varied by setting. Results indicate that various personal and contextual factors relate to teachers' depressive symptoms, with minimal variation by setting.

4.1. Depressive symptoms across settings

Findings from our study indicate that teachers experience depressive symptoms across early childhood settings. Nearly all teachers, across settings, reported experiencing some depressive symptoms in the prior week, and the incidence of clinical depression was roughly 9%. Past estimates of clinical depression among teachers have varied greatly (Corr et al., 2014). Depression is a highly sensitive and personal matter, and its estimation is impeded by stigma and bias (Li & Sung, 1999). Nevertheless, past studies with similarly low rates of clinical depression have found teachers' depressive symptoms to be strongly related to

teachers' interactions with children (Hamre & Pianta, 2004) and children's outcomes (Roberts et al., 2016), suggesting that teacher depression is a critical issue to address.

Understanding what relates to teachers' depression may offer insight into potential risk factors that, ideally, can be altered. To our knowledge, this study was the first to systematically investigate what relates to teachers' depressive symptoms across four early childhood settings, center- and home-based, Pre-K, and K-3 elementary schools. Across these early childhood settings, aspects of beliefs, economic indicators, work-related stress, and demographics significantly related to teachers' depression.

4.1.1. Beliefs

Beyond demographic controls, setting, economic indicators, and work-related stress, teachers who held more adult-centered beliefs had more depressive symptoms. Past work suggests that believing that children learn passively through direct instruction (i.e., an adult-centered belief) is associated with negative outcomes for children (Hur et al., 2015). Although the cause and direction of the association between depression and beliefs about children is unknown, many explanations are plausible. Caregivers who espouse adult-centered beliefs may feel overburdened by the fact that their beliefs do not match the reality of children's natural developmental tendencies. For instance, teachers who are overly controlling may feel frustrated by children's natural tendencies to seek autonomy. Given that adult-centered beliefs can negatively impact children's development (i.e., Clarke-Stewart et al., 2002), teachers may feel disheartened by children's lack of developmental progress. Reverse causality may also be true, such that individuals who are depressed may have ruminating thoughts, engaging in self-focus (Watkins & Teasdale, 2004), and inflexible thinking (American Psychological Association, 2013), and thus, espousing adult-centered beliefs, rather engaging in child-focused perspectives and interactions.

In this study, the association between beliefs and depression was moderated by setting. The link between teacher beliefs and depression was more salient for teachers in home-based environments than center-based settings. Previously, Dowsett et al. (2008) found home-based providers held the most adult-centered beliefs compared to all other settings. It is possible that teachers who hold more traditional, adult-centered beliefs may prefer working in settings where they can generally have more control, such as family child care homes. Alternately, home-based providers may adopt more adult-centered beliefs to meet the unique demands of their environments, for instance, often working with large groups of children of multiple ages, and working alone. However, past work has shown that adult-centered beliefs, specifically in home-based settings, relate negatively to children's school readiness skills (Forry et al., 2013). Taking this into consideration, home-based providers may require unique professional development to meet their needs. Ultimately, more research is needed to better understand the complex linkages between beliefs and depression, especially within home-based settings.

4.1.2. Economic status

Consistent with prior studies outside of the early care and education field (Conger et al., 1994; Dunlop et al., 2003), teachers who did not have health insurance, had lower hourly wages, and who reported working multiple jobs were more depressed. All of these characteristics may represent a cumbersome financial burden that may negatively impact mental health. It is also possible that individuals who are more depressed may select into lower paying jobs, receive fewer salary raises, and may be less likely to obtain health insurance. Nevertheless, for decades, early childhood teachers have been among the poorest compensated professionals (U.S. Department of Health and Human Services & U.S. Department of Education, 2016; Whitebook et al., 2014). Low pay and poor benefits were among the most common reasons early childhood teachers left the profession (Cassidy et al., 2011). Lack of health insurance, in particular, may dissuade individuals experiencing depression from seeking out necessary care. This is particularly unfortunate given the array of effective treatment options for

depression (American Psychological Association, 2013). Ultimately, these conditions that lead to economic strain, may be detrimental to retaining teachers and supporting their mental health, which in the long term, may be costly to businesses and taxpayers, and harmful to teachers and children. Greater effort should be made to address pay equity through policies which increase pay and benefits to deserving teachers (U.S. Department of Health and Human Services & U.S. Department of Education, 2016).

4.1.3. Work-related stress

Past studies have found workplace stress to be related to one's effectiveness in the job (Karasek & Theorell, 1990) and ability to form high-quality relationships with students (Hyson & Biggar, 2006; Whitaker et al., 2015). In the present study, teachers who felt more demands and fewer resources were more depressed. To review, demands include workplace challenges, such as parents blaming teachers, parents not communicating with teachers, and children's behavior problems or needs (Curbow et al., 2000). In a qualitative study, center-based and home-based providers identified parents as primary sources of workplace stress, suggesting that discordant parent-teacher relationships can pose challenges (Faulkner, Gerstenblatt, Lee, Vallejo, & Travis, 2016). Resources, which include perceived resources or personal fulfillment, such as feeling respected, influential, and satisfied by their work (Curbow et al., 2000), were most strongly associated with depression in our study. This finding is consistent with a study of caregivers in orphanages in the Ukraine (Raskin et al., 2015) as well as early childhood educators in home-based and center-based settings (Curbow et al., 2003). Consistent with Curbow et al. (2003), feelings of control or autonomy did not relate to teachers' depression in this study, suggesting that although feelings of autonomy may be important to other facets of one's professional life, such as developing close relationships with students (Whitaker et al., 2015), they may be less proximal to teachers' depression.

It is clear that teachers of young children experience considerable workplace stress, from a variety of sources (Faulkner et al., 2016; Li-Grining et al., 2010), which may be associated with depression. Consistent with a bioecological approach, it is necessary to address teachers' well-being systematically, on several levels. Aside from providing health insurance and fair wages, discussed in the previous section, programs can seek to provide more support and alleviate inordinate demands on teachers. Administrators can use reflective supervision (Heffron & Murch, 2010) to work with teachers to identify areas where teachers may need more support. Furthermore, pre-service and in-service teacher education programs can better prepare teachers for the demands of the profession, and teach strategies for coping with stress. Teachers could learn the importance of self-care strategies, such as healthy nutrition, physical activity and social connectedness. Mindfulness, paying attention in the present moment, with intention, and without judgment (Kabat-Zinn, 2013), is emerging as another capacity that may support teachers' resilience to stress. Among the Pennsylvania Head Start Staff, those who were dispositionally mindful were less affected by job stress and had better relationships with children in their classrooms (Becker, Gallagher, & Whitaker, 2017). There is emerging evidence that mindfulness-based stress reduction (MBSR) may reduce the impact of stress on health and well-being, and improve depressive symptoms (Khoury, Sharma, Rush, & Fournier, 2015). Several studies have documented success with supporting mindfulness in teachers (Flook, Goldberg, Pinger, Bonus, & Davidson, 2013; Jennings, Brown, Frank, Doyle, & Oh, Y...Greenberg, M. T., 2017; Roeser et al., 2013).

4.1.4. Age

Although demographic characteristics were not of primary interest in this study, it is worth pointing out that teachers' age strongly related to teachers' depression. Consistent with a Canadian study of the general population (Akhtar-Danesh & Landeen, 2007), our study found younger teachers had more depressive symptoms than older teachers. Although

it is unclear why this association is so pronounced, it suggests that it may be beneficial to provide mental health support to younger, less experienced teachers across all early childhood settings. It is possible that the tasks expected in teaching young children may be overwhelming for younger, less experienced teachers. The transition from training to teaching may be a particularly sensitive period for early career teachers; a recent study found K-12 teachers' depressive and anxious symptoms increased across this transition, and teachers who transitioned to less supportive school environments became more anxious and depressed (McLean, Abry, Taylor, Jimenez, & Granger, 2017). In light of these findings, pre-service teacher education should focus on supporting resilience in its candidates, and schools and programs should provide early career teachers with more tools for stress management and stronger mentorship.

4.2. Limitations

The strengths and contributions of this study—identifying factors associated with depressive symptomatology in a large sample of early care and education teachers across four settings—must be balanced with its limitations. First, the study utilized self-reported measures which may suffer from social desirability bias, underreporting, selection bias, etc. Given the social stigma association with depression, teachers may not have honestly reported their symptomatology or may have chosen not to complete and return the survey. Second, the cross-sectional nature of the data only indicates association; no causal claims can be made. We recognize that depression is a complex disorder that affects individuals in and outside of the workplace; the present study does not seek to uncover the complex etiology of depression, but rather identify associations, or possible risk factors, relevant to one specific context. Third, lack of diversity in the full sample and relatively low response rates, especially among home-based providers, may limit generalizability to the broader national context.

4.3. Future directions

As attention remains on how best to support the early care and education workforce, this study seeks to contribute to a growing body of literature focused on the well-being. More work needs to be done across early childhood settings to gain a greater understanding of the field at large. It would be beneficial for future studies to replicate and extend this work in more diverse samples, utilizing measures from multiple sources, methods, and time points, and capture other potentially relevant characteristics. For instance, it would be beneficial to identify the association between depression and social support. For center-based and elementary schools, the quality of workplace relationships and trust (principal/teacher or teacher/teacher), is particularly important to consider, whereas in home-based settings, feelings of isolation may be most pertinent (Faulkner et al., 2016). To the extent possible, more work should utilize quasi-experimental methods to examine possible causal associations. Future work should also explore other aspects of teachers' health, including additional measures of mental health, such as anxiety, as well as teachers' physical health, exploring the incidence of co-morbidity. It would also be advantageous to take a strength-based approach to examine positive aspects of teachers' well-being. For example, teachers may leverage areas in which they flourish, such as finding purpose in their work, to cope with the relatively high stress of the profession (Ryff, 1989).

4.4. Conclusion & implications

This study provides preliminary evidence of the link between beliefs, economic status, and job-related stress on early care and educators' well-being. It emphasizes the importance of ensuring that individuals who are caring for and educating young children are well-compensated, have access to affordable health care, and do not feel

overburdened by stress, in order to ultimately minimize the negative impact of depression. This inquiry and its implications are consistent with the national clarion call to “transform” the workforce for young children (IOM & NRC, 2015). Several factors were identified that are associated with teachers' depression, and therefore their well-being, seen as central to producing high quality outcomes for children. Future research should focus on identifying the degree to which these associated factors can increase teachers' well-being. For home-based providers in particular, this study notes the importance of deeper examination of the role of adult-centered beliefs on depression and subsequently, teaching. As policymakers, practitioners, and community leaders seek the best ways to support and strengthen children's learning and development, the workforce is key, and their overall functioning and well-being must be supported.

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