HEALTHY HEARTS IN FAMILY CHILD CARE:
WHAT IS THE CURRENT STATE OF PROVIDER HEALTH?

BY
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DISSEPTION
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Abstract

Family child care providers (FCCPs) are an important source of child care for close to 1.5 million children under the age of five (Laughlin, 2013). FCCPs provide care to children in their own homes and tend to be a source of care for lower income children. As child care has been identified as a risk factor for childhood obesity (Geoffroy et al., 2013), there have been a few efforts to create quality interventions targeting children in family child care (Mann et al., 2015; Trost, Messner, Fitzgerald, & Roths, 2011). However, little is known about the health of these providers (Gratz & Claffey, 1996). This is the first set of studies to look specifically at FCCP self-reported and objectively measured health. A modified double ABC-X model (McCubbin & Patterson, 1983) was used to examine FCCP cardiovascular risk and resilience processes.

Study 1. FCCP health was compared to a matched sample from the same state using data from the Center for Disease Control (2014). Online and paper-based surveys were utilized to form an analytic sample of 165 FCCPs. SPSS v23 was used to calculate descriptives, chi-square tests, multiple imputation and logistic regression. FCCPs were less healthy compared to the matched sample on multiple indicators including general health, emotional support, satisfaction with life, likelihood of not seeing a doctor due to cost or for another reason, consumption of one or more fruits per day, overweight or obese body mass index (BMI), fewer than 7 hours of sleep per night, high blood pressure, diabetes, and asthma. The likelihood of FCCPS being classified as overweight or obese was significantly increased with unhealthy eating, lack of physical activity, and higher than average perceived stress.

Study 2. Due to the high levels of overweight and obesity in the first study, the second study was conducted to determine how these high levels might affect the cardiovascular health of FCCPs. This in-person study collected anthropometric and physiological measures in addition to more in-depth survey questions about cardiovascular health on 67 FCCPs. SPSS v23 was again used for descriptives, correlations, multiple imputation, and multiple regression. Two different Framingham Cardiovascular Risk Scores predicting risk for the next 30-years (FRS30) were calculated using BMI (FRS30B) and lipid (FRS30L) measures. The FRS30B was a better assessment in this population than the FRS30L. On average using the FRS30B, FCCPs had a 21.85% chance of having a cardiovascular event in the next 30 years, with 73.13% of over the normal risk and 86.57% over the optimal risk based on FCCP age and sex. Cumulative risk factors (not physically active, unhealthy eating, not seeing a doctor due to cost, arthritis, and depression diagnosis) and cumulative protective factors (low stress, very satisfied with life and would choose child care as career again) were determined based on correlations of over 0.10 with the FRS30B. Cumulative protective factors were found to significantly moderate cumulative risk factors. This finding supports the adapted double ABC-X model for FCCP cardiovascular risk and resilience processes.
These studies are the first to provide evidence that, in addition to higher rates of overweight and obesity, FCCPs may also have poorer cardiovascular health. Given the centrality of this setting in the lives of over 1.5 million small children, these results have important implications for intervention work with FCCPs and for further exploring resilience in the context of cardiovascular health.
For family child care providers,

in recognition of the hard work that you do and the

valuable contribution you make to society.
Acknowledgements

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Chapter One: Introduction

Introduction

Today, over twenty years after early research on child care provider health, the literature remains scarce in this area. Research continues to grow in the area of child health promotion as a way to foster healthy lifelong trajectories for children. One such example is Head Start, one of the most popular programs in the United States, designed to provide enriched educational environments for the healthy development of children in low-income families (Lamb, Sternberg, & Ketterlinus, 1992). For decades, researchers have also been stating the importance of the health of teachers and care providers in creating these healthy, high-quality care contexts for children (Baldwin, Gaines, Wold, Williams, & Leary, 2007; Bloom, 1948; Calder, 1994; Gratz & Claffey, 1996). Despite the importance of provider health, a paucity of literature continues to exist in this area. Perhaps even more alarming than the lack of research is the sparse existing data suggest that child care providers may have poorer health than similarly matched groups. For example, one study showed that Head Start child care providers may be less healthy, physically and mentally, than a sociodemographically-matched sample from the same state (Whitaker, Becker, Herman, & Gooze, 2013). Head Start providers tend to have higher education levels, income levels, and supports in their workplace making these results particularly troubling when thinking about other types of child care providers.

Child care is important to consider, as the majority of children under age five (12.5 million) now spend some portion of their week in this context for an average of 32 hours each week (Laughlin, 2013). It is in child care that these children will learn and grow during the majority of their weekday waking hours, eat the majority of their weekday meals, and get most of their weekday active play (Mann et al., 2015). For this reason, child care has been looked at as an opportunity for intervention for childhood obesity (Story, Kaphingst, & French, 2006) and the health of child care providers has been shown to be relevant to the quality of care provided to children (Baldwin et al., 2007). Consequently, to promote quality care for children and for the wellbeing of child care providers, it is important to address child care provider health.

Family or home-based child care providers are those that take care of children in their own home. They are an important source of child care, especially for very young children. These providers are often less educated and receive lower pay than center providers, who provide care in age-separated classrooms often with an assistant, (Whitebook, Phillips, & Howes, 2014; Whitebook, 1999) making it likely that family child care providers (FCCPs) could have even higher health risks. Presently, the family provider population has been largely neglected in the literature. While a few studies do address provider health, they focus mainly on center providers. As these FCCPs are often operating in low-resource settings while
also caring for children of lower income families (Whitebook, 1999), it is particularly important to address their health.

One way to think about health in the child care setting is to look at cardiovascular health. Cardiovascular diseases (CVDs), which negatively impact the heart and blood vessels, cause the highest number of deaths each year in the U.S. (Santulli, 2013). Factors related to prevention of CVDs are also related to other high mortality diseases. Developing healthy habits early can lead to a reduction in CVD risk. Child care is a unique context where promotion of both adult and child heart health could be achieved in order to promote lifelong Cardiovascular (CV) resilience. This study examines the heart health of family child care providers. The overarching goal of this research is to inform interventions, support networks, and policies so that family child care (FCC) can become a heart healthy context for providers and children.
A Brief History of the Problem of Cardiovascular Disease.

CVDs continue to be the leading cause of death in the United States (U.S.) as well as globally (Santulli, 2013). These statistics are not just true of deaths in the later years of life. Across all age groups, including 1 – 24 years of age, heart disease falls within the top five causes of mortality in the U.S. (Miniño, 2013). These staggering statistics have led to an abundance of research in this area including identifying risk factors for CVDs. Today, these diseases are considered the most common cause of preventable death (Santulli, 2013).

Determining risk factors for CVD began with the six-year follow-up of the Framingham study, a study started in 1948 to investigate longitudinally preventable factors might be related to CVDs (Kannel, Dawber, Kagan, Revotskie, & Stokes, 1961). Risk factors established in the Framingham study have become standard in the CVD literature today. Examples of risk factors that create a predisposition include obesity, sedentary behaviors, and poor dietary practices (Yusuf, Reddy, Ounpuu, & Anand, 2001). There are also now “risk markers” which are factors associated with CVD but not causally, such as low socioeconomic status (SES), high inflammatory factors, and psychological factors (e.g., depression and stress; Yusuf et al., 2001). Long-term exposure to such factors, starting at conception and continuing through old age, is now thought to have an impact on CVDs, leading the most recent literature to suggest a life course approach to understanding and preventing these diseases (Ghosh et al., 2014).

Another pertinent question is not just what risk factors over the lifespan can be prevented, but what factors provide CV resilience. Resilience, or positive adaptation in the face of adversity (Masten, 2007), has been well characterized in psychological and developmental literatures. Until recently, however, there has been little application of resilience to biological mechanisms, such as those related to chronic diseases (e.g., CVD; Chen & Miller, 2012). Children growing up in low SES populations have been shown to have an increased future risk for CVD even after accounting for current SES as an adult (Galobardes, Lynch, & Davey Smith, 2004). However, not all children exhibit this increased future risk for CVDs. One possible explanation is the “shift-and-persist” strategy. This approach is specific to children growing up in low SES families that show both the shift (accepting and reappraising stressful situations as less stressful) and persist (continuing forward with strength through meaning-making and optimistic views) components of the strategy (Chen & Miller, 2012). There is evidence that using both shifting and persisting may lead to CVD resilience often seen in low SES children (Chen & Miller, 2012).

Child Care as a Context for Health Promotion

Child care is a context where ecological approaches, consideration of risk and resilience, and CVD prevention may align to maximize positive impact. For the 12.5 million children under age five spending some portion of waking time in care (Laughlin, 2013), child care is now being considered in the
literature as a highly viable option for prevention efforts. In one study of pediatricians, nurse practitioners, child care directors, and parents, the majority saw child care as an important context for health promotion, especially during the preschool years (Gupta, Shuman, Taveras, Kulldorff, & Finkelstein, 2005). Others have echoed this sentiment, seeing great promise in developing healthy habits through child care and even seeing potential for such habits to continue on into adulthood (Story et al., 2006).

Obesity is an area of great concern in child care. The child care context may support healthy growth and development for children, but it is also a potential risk factor for obesity. In a 10-year longitudinal study from Canada of children in parental vs. center care or FCC, those in either type of child care were more likely to be obese than those in parental care (Geoffroy et al., 2013). These results are concerning as obesity in childhood or adolescents may be related to early type II diabetes and CVD risk (Goran, Ball, & Cruz, 2003). However, reducing this risk is possible. A few interventions in center-based child care have been successful in changing child weight status and several others have impacted physical activity levels and/or nutrition behaviors (Larson, Ward, Benjamin Neelon, & Story, 2011).

To date, much less is known about FCC. Previously, there had only been one intervention specifically targeting children in FCC (Trost et al., 2011). A new National Institute of Health funded intervention for FCC is currently being completed called Keys to Healthy Family Child Care Homes (Mann et al., 2015; Ward, Vaughn, Burney, & Østbye, 2016). This new intervention includes provider health elements that encourage providers to be good role models for children. This is an important step forward for interventions in FCC. However, the lack of literature about the health of these providers merits further study to help bolster such interventions. FCCPs are interested in child health promotion and believe they can have an impact. Compared to center providers, FCCPs actually rate their influence on children closer to that of parental influence on food preferences, eating habits and weight status (Kim, Shim, Wiley, Kim, & McBride, 2011). FCCPs are also interested in health promotion and see themselves playing a role in health promotion for children and families in their care (Rosenthal, Crowley, & Curry, 2008).

Better understanding the health of child care providers will be imperative to continue to improve health promotion in this context. An increased understanding of FCCPs, who are likely working with fewer resources and families of lower income levels, is of particular importance. One example of an intervention focused on the providers is a study that added a worksite wellness component to their child care health intervention. This study showed that adding this worksite wellness element improved healthy food-related practices for children compared to the group receiving only child health information (Gosliner et al., 2010). Researchers attributed these results to providers translating learning about their own health to the children in their care. These results are particularly intriguing as even providers who only participated in portions of the worksite wellness showed child level changes (Gosliner et al., 2010).
Ecologically speaking, better interventions should result from multiple areas of intervention. For future interventions targeting providers, it would be advantageous to understand more about provider health. In this way, interventions can be tailored to meet the specific needs of center and FCC providers.

**Theoretical Lenses**

**Socio-ecological model.** Most FCCPs experience overlap between their work and home contexts. They have children who belong to other families in their home each day. This allows these other families access to impact the provider’s personal home setting. Many FCCPs take care of children receiving child care assistance from the government leading to an additional external influence on their home setting as well. When considering FCC as a health context, it is important to think in a socio-ecological manner. The purpose of a socio-ecological model is to assist in the examination of the many factors, as well as possible interrelationships between factors, affecting a person’s development (Bronfenbrenner, 1979). Using this framework can help identify factors to target for lasting positive change. Such an approach in the health literature can assist in avoiding blaming the victim. It is not possible for most people, at least not individually, to exert control over many of the environmental and external influences impacting their health (McLeroy, Bibeau, Steckler, & Glanz, 1988). Therefore, it is important to consider factors FCCPs may have control over and those they may not. The socio-ecological model allows exploration of the levels of these factors, how they interact, and points where changes may have the largest impact.

**Risk and resilience model.** While the socio-ecological model acknowledges the many factors involved in development, this complexity can also make it difficult to interpret. For this study, a risk and resilience framework will be utilized. Specifically, a double ABC-X model (McCubbin & Patterson, 1983) modified to fit the FCC context will be used to further organize and understand environmental factors and their relationships. The double ABC-X model is well established in the literature as a highly useful and influential model within the area of stress, coping and resilience (Migerode, Maes, Buysse, & Brondeel, 2012). As no such model exists specifically for cardiovascular risk and resilience, an adapted model has been created.

**An overview of the model.** In the traditional double ABC-X model there are stressors (factor a), existing resources (factor b), and perceptions of the stressors (factor c) that interact with one another and may lead to a crisis event (x). If not resolved, the crisis may be exacerbated by a pile-up of stressors (factor aA; McCubbin & Patterson, 1983). In the adapted model (See Figure 1a and b), the stressors, resources, and perceptions remain the same. More detailed examples of each part of Figure 1a are in Figure 1b. Those with asterisks are examples that will be used in this study to understand aspects of FCCP CV risk and resilience. With CV risk, a crisis event that is recognizable may or may not occur. Rather than a traditional crisis event, a cumulative vulnerability for CVD or a pile-up of CVD risks is used in its place. It could be expected that all FCCP’s would have one or more areas of vulnerability for
The Family Child Care Cardiovascular Risk and Resilience Model
(A Modified Double ABC-X Model)
Figure 1b. Specific Examples of Risk and Resilience factors for Family Child Care Providers. The factors with asterisks by them will be part of the proposed studies.

<table>
<thead>
<tr>
<th>Stressors/Risks</th>
<th>Resources</th>
<th>Perception/Appraisal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Health Related Risks</td>
<td>Any Strengths or Skills</td>
<td>Health Knowledge</td>
</tr>
<tr>
<td>• Nutrition (unhealthy eating)*</td>
<td>• Social Support*</td>
<td>• Family History*</td>
</tr>
<tr>
<td>• Physical Inactivity/Sedentary Time*</td>
<td>• Possible sources include: family, friends, parents of children in care, professional network, and spiritual network</td>
<td>• Meaning Making</td>
</tr>
<tr>
<td>• Genetic Predispositions (ex: LDL receptor mutation)</td>
<td>• Child Care Resource and Referral</td>
<td>• Personality</td>
</tr>
<tr>
<td>• Abnormal Cholesterol Values</td>
<td>• Bonding</td>
<td>• Tendency toward Optimistic vs. Pessimistic views</td>
</tr>
<tr>
<td>• Elevated Total*, LDL, and Triglycerides</td>
<td>• Psychological</td>
<td>• Culture</td>
</tr>
<tr>
<td>• Low HDL*</td>
<td>• Physiological (e.g. oxytocin)</td>
<td>• High satisfaction</td>
</tr>
<tr>
<td>• Other chronic diseases</td>
<td>• Self-efficacy</td>
<td>• Life (general)*</td>
</tr>
<tr>
<td>• Diabetes*</td>
<td>• Physical Activity</td>
<td>• Job*</td>
</tr>
<tr>
<td>• Untreated thyroid disorders</td>
<td>• Nutrition</td>
<td></td>
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<tr>
<td>• Hypertension*</td>
<td></td>
<td></td>
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<tr>
<td>• Inadequate sleep*</td>
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<tr>
<td>• Overweight/Obese*</td>
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<tr>
<td>• Alcohol</td>
<td></td>
<td></td>
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<tr>
<td>• Tobacco*</td>
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<tr>
<td>Mental Health Related Risks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Anxiety and/or Depression*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Stress</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Perceived*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Physiological Response (e.g., cortisol)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Lack of Valuing of Occupation by Society</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demographic Risks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Age and Sex*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Low Socioeconomic Status*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Lack of access to healthcare*</td>
<td></td>
<td></td>
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<tr>
<td>• Lack of benefits (e.g., health insurance)*</td>
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<td></td>
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<tr>
<td>• Lack of vacation/sick days</td>
<td></td>
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<tr>
<td>Geographic Risks</td>
<td></td>
<td></td>
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<tr>
<td>• Lack of access to parks or nutrition foods</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Unsafe neighborhood or community</td>
<td></td>
<td></td>
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<tr>
<td>• Environmental Toxins</td>
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later CV events, as the risk factors for CVD cross so many domains. This change also makes the model more useful for generating preventative strategies. A crisis event could, however, occur such as a heart attack or stroke. If an FCCP has a survivable event, then this also increases her vulnerability for future CVD events making the model highly adaptable and useful in the child care provider context.

**The coping-adaptation continuum.** Maladaptation in this model occurs when FCCPs are not effectively addressing or are unable to alleviate stressors. Examples of a stressor/risk that FCCPs may be unable to change readily or at all might be socioeconomic status or a family history of heart disease. FCCPs may also consciously or unconsciously decide to *not* work on alleviating stressors such as not taking blood pressure medications for diagnosed hypertension. Bonoadaptation is the positive end of the coping-adaptation scale and is defined as working to alleviate stressors/risks for CVD. This end of the continuum represents the process towards CV resilience. Although FCCPs are not necessarily coping with adverse situations as in Masten’s previously discussed definition of resilience (2007), FCCPs are positively adapting in the face of unfavorable risk factors that even when modifiable can be difficult to change. Health and CVD decisions must be made across the lifespan. So, bonadapation in this model is a snapshot of the process toward lifelong CV resilience.

**The Transtheoretical model.** In this risk and resilience model, there are many risk factors to address. The transtheoretical model could aid further understanding of this risk and resilience model for intervention purposes through its proposed stages of change. In the preparation or action stages a person has taken some steps or has actually made a change in the past few months (Glanz, Rimer, & Viswanath, 2008). If an FCCP has made it to the preparation or action stages in one or more areas regarding modifiable risk factors, then she is moving towards CV resilience and would be closer to the bonadapation portion of the coping-adaptation continuum than the maladaptation portion of the continuum. In this way, the transtheoretical model can aid our understanding of where on this continuum FCCPs are at a particular point in time.

**Child Care Provider Health**

**History and policies.** In order to put these studies on child care provider health into context, it is necessary to understand the historical context surrounding children in non-parental care. In the late 1800s, women who worked were those most likely to use child care and were also most likely to be considered impoverished, a state considered pathological at the time; as such, children in these families were often moved to orphanages (Getis & Vinovskis, 1992). By the early 1900s, the government decided that children should remain in parental care unless it was absolutely necessary to remove them and developed a pension program to allow impoverished mothers to stay at home with their children (Getis & Vinovskis, 1992). The New Deal was the first time child care was seen as a way to provide jobs for women during the depression era and was considered a necessity during World War II when it was essential for women
to help with defense manufacturing (Getis & Vinovskis, 1992). The media helped push women out of the workforce and back home to take care of their children using false stories of the damaging effects of child care on children using children from war-torn areas to portray the dangers of using out of home child care after the war ended (Getis & Vinovskis, 1992).

In the 1960s, the War on Poverty led President Johnson to sign into enactment the Heat Start program (Lamb et al., 1992). In the early 1970’s congress attempted to pass legislation that would allow access to quality child care for all children under five years of age, but Nixon vetoed it saying child care was a private matter (Lamb et al., 1992). This clear ideological clash over representing child care as a public or private matter continues to play out in policies today. During the 1970s, the public continued asking for help with child care costs and for the opening of more facilities as more women were working as a source of secondary income or primary income and the number of single mothers increased (Lamb et al., 1992). In order to help meet the increased demand for child care, the government dropped all health and safety standards from 1980 to 1990 leading to the public becoming accustomed to a norm of private pay, low cost, and low-quality child care (Lamb et al., 1992). This history continues to affect children today, in part via the value society places on providers and their wages.

Tax breaks for child care were added in the late 70’s helping mostly the middle class with later measures targeted towards families making under $20,000 in the 80’s (Lamb et al., 1992). Block grants were provided to the states to be used for child care subsidies. As a national system was never set in place, regulations and subsidy policies vary widely by state (McGaha, Snow, & Teleki, 2001) making it more difficult to do anything on a national level now or even to conduct research across states. The wide variation in policies is even more true of FCC homes as family homes are considered “private space” (McGaha et al., 2001). More stringent regulations, on the other hand, risk pushing child care providers out of the field (Rigby, Ryan, & Brooks-Gunn, 2014). Still, states with more FCC regulations have been associated with higher quality care (Rigby et al., 2014).

In 1996, welfare reform created new requirements for employment increasing the need for the child care providers while also increasing the number of women looking for jobs (Whitebook, 1999). An influx of less educated and less qualified women into the child care workforce during this time further suppressed wages to just under poverty-level (Whitebook, 1999). Such low earnings leave this primarily female workforce with great difficulty in obtaining health benefits and an even harder time obtaining retirement benefits, with FCCPs seeming to fare worse than center child care providers (Whitebook, 1999). With such a lack of benefits, wages, and respect, it is not surprising that over one-third of the workforce reports leaving child care every year (Whitebook, 1999). Whitebook states in her concluding remarks, “In effect, our nation has adopted a child care policy that relies on an unacknowledged subsidy:
the contribution that child care workers make by being paid much less than the value of their skilled and vital work” (1999).

Such ideologies and state policies highlight factors that are likely to be sources of risk for CVD in FCCPs. As these factors are difficult to change, they are less likely to be areas associated with resilience processes. However, previous literature has advocated for FCCPs to join unions and support networks to help alleviate stress and bring awareness to such injustices (Whitebook, 1999). Such strategies could be areas to promote FCCP CV resilience through using individual support systems to challenge environmental and political risk factors. For this study, the historical context that has led to monetarily and socially undervaluing child care providers and their work and the political indecision as to whether child care is a public or private matter has had further critical implications for the health of child care providers today.

Stress. FCCPs make up a significant proportion of the child care workforce and understanding their workplace stress is important (Atkinson, 1992). High provider stress has long been suspected to be related to a decrease in quality care. Few studies, however, exist in regards to stress in home-based child care. A study out of the Netherlands does, in fact, show that greater stress for home-based care workers is associated with less positive caregiving (Groeneveld, Vermeer, van IJzendoorn, & Linting, 2012). In the context of FCCP CV health, FCCPs’ workplace stressors, and possibly overall stress, may differ from stressors seen for women in other occupations in the U.S.

In 1992, Atkinson conducted a survey on stress and factors potentially related to stress for mothers (N = 918) who worked as FCCPs (n = 40), were not employed (n = 298), or were employed outside the home (n = 580). In Atkinson’s study, a random sample of mothers was recruited using birth certificates and announcements for a quantitative, survey study. FCCPs were significantly more stressed than mothers who did not work and worked more hours for less pay than employed mothers (Atkinson, 1992). Kontos and Riessen led the next study on North Dakotan FCCPs in 1993 looking at satisfaction, stress and commitment. The survey was quantitative in nature (N = 380). The responses showed that rather than program characteristics, personal characteristics were related to greater job stress such as perceiving daily hassles associated with child care, being younger, and having less perceived social support (Kontos & Riessen, 1993). Import to note about perceived social support is that it was not only inversely related to job stress but also predicted higher job commitment and greater job satisfaction (Kontos & Riessen, 1993).

In 1996, a longitudinal study of job stress and turnover in family care was conducted. Survey and interview data were collected at time one and then two years later. Turnover was reported by the child care resource and referral agency. Results from this study show that FCCPs caring for their own young children were more stressed than stay-at-home mothers or those working outside the home, but caring for
their own children did contribute to job satisfaction (Todd & Deery-Schmitt, 1996). In Todd and Deery-Schmitt’s study, among FCCPs with less education training was inversely related to job stress. A qualitative study conducted with Texas providers (N = 11) examined work stress and coping techniques through focus groups (Gerstenblatt, Faulkner, Lee, Doan, & Travis, 2013). In these focus groups, FCCPs highlighted their frustration with being disrespected by parents, society and the lack of pay they received (Gerstenblatt et al., 2013). Additional frustrations leading to work stress included: children having different rules at home than during child care hours; parents lack of adherence to the sick policy and pick up times; difficulty maintaining full enrollment; and struggling to keep work and family separated within the same space (Gerstenblatt et al., 2013). This study was the only study to mention FCCP coping strategies and highlight the lack of literature in this area. Examples of self-care strategies used by FCCPs were massages, exercise, socializing, attending church and vacations (Gerstenblatt et al., 2013).

In another 2013 study on FCCP stress, 155 providers in Oregon participated in a survey on stress as well as child problem behaviors and tolerance for those behaviors. Researchers observed the frequency of positive and negative caregiver practices and frequency of physically aggressive or noncompliant behaviors in children (Rusby, Jones, Crowley, & Smolkowski, 2013). Higher provider stress was associated with higher child to provider ratios, working without an assistant, fewer positive attention behaviors toward children, higher reported problem behaviors from children, and lower tolerance for such behaviors (Rusby et al., 2013). In the cardiovascular literature, stress has long been considered and studied as a risk factor for CVD (Backé, Seidler, Latza, Rossnagel, & Schumann, 2012).

The key findings in these studies echo a common theme in FCC of less pay for more hours while adding to the literature that perceived stress is higher in FCC than for nonworking mothers and either not different from or higher than mothers working in other occupations. Overall, these studies are intriguing and warrant further research, especially in regards to teasing out how different personal factors affect provider stress and how individual factors interact with external factors to add to stress or relieve stress for FCCPs. This literature that strives to understand workplace stress for FCCPs is also important for contextualizing our thinking in this study about the possible effects of stress in its relation to CVD in FCCPs.

Health. The next set of studies from the literature focus more on child care providers than children, an uncommon occurrence in the literature. These articles are spread across many different bodies of literature and use differing terminology. These variations make it difficult to ascertain fully whether all literature has been gathered, despite extensive efforts. As FCC is much less studied, it is not surprising that there are only two studies in U.S. that have included FCCPs. As such, all the studies in child care and not just those for FCCPs are reviewed.
The first study looking specifically at the health of child care providers was in 1983, which is historically fitting as this is when the demand for child care was high and was rapidly expanding in an unregulated fashion. A research/technical report was issued by the Child Care Staff Education Project on the results of a study of 89 child care providers from 20 states (Whitebook & Ginsburg, 1983a). In a previous study, 67% of responding providers felt that their health had adversely been affected by their job. Whitebook and Ginsburg involved the Labor and Occupation Health Project to help create a survey pertinent to the possible occupational hazards in child care. Responses to the survey revealed hazards such as frequent use of pesticides, frequent exposure to illnesses at work (leading to illnesses in child care providers), the inability to take off from work (leading to over half of providers to have worked while sick), improper labeling of chemicals; a lack of access to medical care, and physical strains from using child-size furniture as well as moving children and heavy objects (Whitebook & Ginsburg, 1983a). The same year these authors released information to child care providers through an article titled “Warning: Child Care Work May be Hazardous to Your Health” in a journal targeted toward early education (Whitebook & Ginsburg, 1983b). The article included resources and information to help providers address such hazards.

The next wave of research came from the medical field in 1990. There had been an outbreak of B19 infection, fifths disease, in Connecticut. Researchers took the opportunity to study the effects of such an outbreak on the transmission of this infection to teachers and child care providers (Gillespie et al., 1990). Fifths disease is typically not dangerous in and of itself but has been associated with birth defects when women are exposed during pregnancy (Gillespie et al., 1990). Gillespie et al. found that the infection rate for child care providers was the highest when compared to other teachers and staff, likely because this disease is most common in young children. Supporting this notion, the next highest infection rates were in teachers for younger grades. These rates for providers and teachers were higher than that seen in the community population during the active outbreak; thus providing evidence that child care providers and teachers may be at increased risk of infection due to this setting (Gillespie et al., 1990). In the same issue as this article, an editorial by two medical doctors offered advice about caring for child care providers related to their increased occupational risk for infections not typically seen in adults (Pickering & Reves, 1990). This article was based on their recently published article at the time on considerations for internal medicine regarding caring for child care providers (Reves & Pickering, 1990). Occupational risks included watching for uncommon infectious diseases in adult providers such as Shigellosis, Hepatitis A and Tuberculosis and reporting to public health departments to prevent or respond to an outbreak at child care centers (Reves & Pickering, 1990). They emphasized the risk to providers primarily of contracting diseases more than providers passing on diseases to children; they argued the latter to be much less of an issue. They also echoed the concern for fifths disease leading to
birth defects in pregnant child care providers for other diseases such as cytomegalovirus and rubella (Reves & Pickering, 1990).

The next study broadened the scope from occupational illness risks to data on many risks from multiple studies. This information was compiled by a public health nurse and titled “Occupational Health and Safety Issues for Child-Care Providers” (Calder, 1994). In the early 1990s, this article was particularly relevant as changes in legislation such as block grant subsidies and child care tax breaks had started, health and safety standards had been re-established, and the majority of children would have been spending some part of their day in care. Calder reviewed several of the main risks for child care providers including being at a higher risks for 16 specific infectious diseases (e.g., chicken pox and tuberculosis), back injuries, dermatitis, bites, stress, hazards (e.g., cleaning supplies, art materials, pesticides, accidents), and exposure to infections while pregnant. Calder states that not having providers that were both well trained and informed placed children at risk during their hours in care. These providers control the environment and health and safety of children during the time they spend in their care. At the time, only 30% of providers reported having health insurance (227 centers in five large cities) which posed risks to providers and children (Calder, 1994). It is likely then that FCCP rates of insurance at this time were even lower, as FCCPs would have had to purchase their own insurance or have received insurance through a spouse’s employer (Whitebook, 1999).

From this work, Calder makes recommendations for future research in the areas of pre-existing conditions, chronic conditions, health habits, disease susceptibility, and possibilities for health promotion (1994). She also mentioned anecdotally that providers are more likely to accept health information important for the children in their care but not to translate that information and apply it to themselves. She cited lower self-esteem as a possible mechanism and suggested further work in this area as lower self-esteem might lead to poor role modeling for children (Calder, 1994). Calder’s work provides further evidence that the health of child care providers is relevant.

The next study, conducted in 1996, is one of the only studies in the U.S. on child care provider health that included FCCPs and did so purposefully to start documenting their health in the literature (Gratz & Claffey). Random selection by county was completed to create a sample of 1000 representative center directors, providers, and FCCPS in Wisconsin. The anonymous survey had an overall response rate of 45% (N = 446). Results showed once again that FCCPs were working longer hours than center providers with 98% saying they worked an average of 9 hours or more per day; however, FCCPs were more likely to rate their health as excellent than center providers (Gratz & Claffey, 1996). Gratz and Claffey also found FCCPs were less likely than center providers to report contracting illnesses more often after working in child care than before. This finding could be explained in part by FCCPs’ longer average time working in child care (7.4 years) than center providers (2.9 years). Only 21% of FCCPs reported
having health insurance compared to 53% of center providers (Gratz & Claffey, 1996). All reporting child care providers in Wisconsin were more than twice as likely to categorize themselves as overweight than the state average; for FCCPs, 72% rated themselves as overweight (Gratz & Claffey, 1996). FCCPs were more likely to report excellent nutrition (27%) and equally likely as center providers to report exercising three or more days per week for 30 minutes at 38% (Gratz & Claffey, 1996). The number of providers reporting feeling stressed was high, with 95% of all providers in Gratz and Claffey’s study reported being stressed at work. These results are the broadest and most in-depth results up to that point and likely remain so today.

The next study on provider health was conducted in Georgia in 2007 using 347 survey responses (Baldwin et al., 2007). Once again, providers most often reported good to excellent health status (86.8%) and having an annual physical exam (73%). In this study, health behaviors specific and age appropriate to women were also asked. These items included frequency of pap smears, mammograms and rectal exams. Child care providers were participating in these screenings but not at recommend levels (Baldwin et al., 2007). As for other health practices, most providers reported not smoking, wearing their seat belts, driving the speed limit and consuming moderate or lower levels of alcohol. Over half reported being overweight or obese (50.1%), nearly half reported getting sick from work, and most reported emotional strain and stress (Baldwin et al., 2007). Interestingly, when asked in Baldwin et al.’s survey, providers did not believe that their health affected their ability to provide quality care. This finding does not fit with the literature suggesting quality is related to provider health but is interesting as it is the first time providers’ perceptions on this matter were examined.

As mentioned earlier, the only intervention to focus on child health that included a worksite health and wellness component for providers occurred in 2010 with 82 staff (43 intervention group and 39 control group) from 13 participating centers (Gosliner et al., 2010). Intervention and control groups received training on health and nutrition for children with new policies provided for the center on nutrition and physical activity. The intervention group also received the worksite wellness activities including a kick-off wellness training, monthly newsletters, information in paychecks, a walking program and staff follow-up visits (Gosliner et al., 2010). Child care providers made health improvements by decreasing their sugar-sweetened beverage consumption at the end of the 10-month intervention. None of the other categories regarding exercise, TV watching, physical activity intentions, junk food consumption, fruit and vegetable consumption or drinking more water changed compared to the control group. The intervention group did report having an easier time talking to parents about eating and physical activity for children than the control group. No pre-surveys were competed for child level food questions but between groups comparisons were performed. Compared to the control group, the intervention group did increase fresh fruits and vegetables for meals and snacks as well as increased fresh fruits while decreased
sugar-sweetened beverages and foods at celebrations for children (Gosliner et al., 2010). Gosliner et al. attributed these changes to providers applying what they learned about their own health to the children in their care and suggest future, more rigorous intervention studies also add a provider component.

The largest survey study conducted on child care provider health occurred more recently. This study, published in 2013, focused on Head Start providers in Pennsylvania (Whitaker et al.). Physical and mental health was evaluated for 2,122 providers and, the prevalence of health factors was compared to a matched sociodemographic sample from Pennsylvania using one of the two major Center for Disease Control national survey studies. Whitaker et al. used six physical health indicators including severe headaches, lower back pain, obesity, asthma, high blood pressure and diabetes/prediabetes. All indicators were higher in the Head Start providers than in the matched reference group. For example, 37.1% of providers had been classified as obese compared to 27.3% in the matched sample, 36.9% reported lower back pain compared to 23.9%, and 18.7% reported having asthma compared to 13.6%. Depression diagnosis was also at a higher prevalence than the reference group as was fair or poor self-rated health (14.6%), which was almost three times higher than the reference group (Whitaker et al., 2013).

Head Start providers were also more likely to have physically or mentally unhealthy days totaling over 14 days per month than the reference group. Surprisingly, these providers had higher percentages of having health insurance and a personal doctor than the reference group, but equivalent rates for seeing a dentist in the past 12 months (Whitaker et al., 2013). Taken together these results are concerning and raise many questions as to why these Head Start providers would be less healthy than a matched sociodemographic group. Given that FCCPs tend to be less educated, earn lower wages, have less of a support system at work, and are less likely to have health insurance than Head Start providers, it is concerning to think about how their health status may compare.

As previously mentioned, a new intervention is being tested for FCC in North Carolina. Although not a primary outcome, during the pilot work for this intervention, 74% of 89 FCCPs were classified as overweight or obese (Østbye et al., 2014). In North Carolina in 2014, 60.8% of females in the state were overweight or obese (Center for Disease Control, 2014b). The rates in this sample of FCCPs are roughly 13% higher and continue to tell a story that providers may be less healthy than others living in their region. It is important for studies to start investigating child care provider health, particularly FCCPs who are so often forgotten in the literature and policy conversations. As chronic diseases, such as CVD, have become such an issue in the U.S., understanding and measuring such risk factors in this population continues to be important for future studies.

A brief look at child care provider health in other countries. Just as in the U.S., very little literature regarding health and wellbeing of child care providers exists in other countries. Here are three examples from the literature with one from each of three different countries. In Hong Kong, similar
results were found as compared to results in the U.S. literature, showing that preschool care providers (N = 834) scored substantially lower on the health-related quality of life scale (SF-36) than the general population (Chan, 2012). When asked about chronic illnesses, 21.0% reported having suffered from a chronic illness. The study showed that the high demand for physical and mental energy left providers stressed, with lower quality of life and poorer health conditions than in the general population (Chan, 2012).

In a New Zealand study, there was no comparison to the general population, however, home-based educators (a group that included FCCPs; n = 37) reported fewer health concerns than child care center providers (n = 73) or kindergarten teachers (n = 58; McGrath & Huntington, 2007). In this sample, home-based educators were on average ten years younger than the other provider types. As younger people tend to be healthier and have fewer health issues, this may account for some of the differences. As with other studies, sick leave and pay were the top issues for home-based providers in New Zealand as well. All providers reported similar issues as in the U.S. regarding illness, fatigue, and back pain (McGrath & Huntington, 2007). However, contrary to the U.S., about half of providers reported their weight was normal, and only 2% reported being obese. Overall general health was similar in that 92% reported good to excellent health (McGrath & Huntington, 2007).

In Australia, focus groups and survey data were collected from center child care providers (n = 88) and FCCPs (n = 118) to better understand health in this population (Slack-Smith, Read, Darby, & Stanley, 2006). FCCPs were more than three times less likely to take sick leave than center providers. They were also less likely to report asthma, hay fever, allergies, dermatitis or currently being a smoker when compared to center providers. Both types of providers reported chronically being tired from child care work. Areas of primary health concerns were similar to U.S. studies with stress, illness, and back injuries or accidents among the top concerns (Slack-Smith et al., 2006). Results from all three studies make reference to the lack of literature in their countries on child care provider health.

**Methodology.** Most studies have utilized survey-based measures of self-reported health, with few employing qualitative or observational measures. This makes sense in that FCCPs are harder to reach, as they are not congregated together like in center care. In order to understand FCCP health, it will be important, however, to do observational and qualitative pieces along with surveys. It will also be imperative to obtain objectively measured data on health rather than only self-report. Additionally, more in-depth analyses of these data beyond pure descriptive papers would help tease apart what is meaningful for FCCP health. Since FCCPs are a more difficult population to capture, this study began by conducting an online and paper survey followed by a more in-depth data collection in a smaller sample to identify risk and protective factors implicated for understanding FCCP CV health.
Some methodological challenges in past literature are in part due to state policies. Each state has different policies making it difficult to judge whether studies on FCCPs are actually referring to the same population (Morrissey & Banghart, 2007). Studies should provide detailed interpretation on their results in light of pertinent state policies. For example, Gratz and Claffey contextualized their results stating that it was surprising that the number of providers with insurance was low but those having seen a doctor in the past year was quite high (Gratz & Claffey, 1996). They examined policies for the state that mandate a physical before hiring providers in center. Most center providers in their sample were rather new to center care. Additionally, FCCPs were required to have a physical to remain licensed (Gratz & Claffey, 1996). Such attention to detail at multiple levels of the socio-ecological model is important in evaluating and further understanding FCCP health.

Conclusion

In summary, directing attention to the health of child care providers is ethically important to addressing the criticisms Whitebook made about U.S. system subsiding care through the low wages and low respect for child care providers (1999). In the context of health justice, our society considers health to have special moral importance as it provides the ability for equal opportunity; a lack of health often corresponds with other social injustices (Daniels, 2008). Therefore, it is not just important in the area of child health promotion to study child care provider health, but also for making sure that there is just distribution of resources to child care providers, the proud and important caretakers of our nation’s young.

In order to better understand the current state of FCCP health, two studies were conducted. In study 1, provider health is considered more generally. FCCP health is compared to a matched sample so as to better understand the current health status of FCCPs. Online and paper-based surveys were utilized for this purpose and included questions for comparison with state or national health and demographic data. Factors related to a higher likelihood of being categorized as overweight or obese for FCCPs were also assessed. Study 2 examined self-reported and objectively measured factors related to FCCP 30-year CV risk. This in-person study collected anthropometric and physiological measures in addition to more in-depth survey questions. Cumulative risk and protective factors for 30-year CV risk were assessed. More detailed measures of nutrition and physical activity including providers’ stage of change were also examined. These two studies are aimed at not only providing detailed information about the current health status of FCCPs but also at providing results that point to areas ripe for future interventions that address the health of these providers.
Chapter Three: Study 1 – Health of Family Child Care Providers Compared to a Matched Sample

Introduction

As discussed, the literature on child care provider health is scarce, but depicts a troubling story of providers being less healthy than would be expected (Chan, 2012; Gratz & Claffey, 1996; Whitaker et al., 2013). Only one previous study from twenty years ago specifically examined the health of FCCPs (Gratz & Claffey, 1996). Therefore, this first study begins with a description of the demographics and health of the sampled FCCP population and compares them to a matched sample. An online and paper based survey was utilized for this purpose which included questions that exactly match or closely align with state or national health and demographic data. These descriptives are followed by analyses aimed at better understanding what might be related to the higher rates of overweight and obesity seen in this population.

Research questions for this study are descriptive in nature as well as hypothesis-driven. Hypotheses are listed for those research questions that extend beyond description. Research questions and hypotheses for study 1 are as follows:

**RQ 1:** How does the sample of FCCPs in this study compare demographically to FCCPs across the same state?

**RQ 2:** What is the current health status of FCCPS and how does it compare to a matched sample from the Behavioral Risk Factor Surveillance Survey (BRFSS) by the Center for Disease Control (CDC)?

**Hypothesis:** Based on the literature, FCCPs are expected to have poorer health outcomes than the matched sample.

**RQ 3:** What factors relate to FCCPs having increased odds of overweight or obese weight status?

**Hypothesis:** Poor dietary patterns, not being physically active, having higher stress scores, and less access to care are expected to be related to being overweight or obese. Being very satisfied with life and always feeling emotionally supported are expected to be protective and associated with less overweight or obesity. Working in their own homes, FCCPs have constant access to food, which could increase risk for poor dietary patterns. Poorer dietary patterns are hypothesized to be related to higher weight statuses even more than these other factors.

**Methods**

**Sample and survey methodology.** The Illinois Institutional Review Board (IRB) approved all research procedures and study measures (IRB # 14146; See Appendix A for Approval Letter). Data for this first study were collected using two sources. The first was an incentivized, anonymous survey of licensed FCCPs from a Child Care Resource and Referral (CCR&R) service delivery area (SDA) in Central Illinois. The director of the CCR&R and a Quality Specialist staff member distributed fliers to a mailing list (example in Appendix B) of 294 FCCPs from December 2013 to May 2014. From this list, 112 FCCPs responses were returned. Thirteen were removed for the following reasons: being a duplicate
response, failing to complete more than the demographic portion of the survey, or failing to complete at least half the questions. The analytic sample for this study was 98 providers, which represents a 33.3% response rate. FCCPs were invited to participate in the study via flyers mailed to home addresses in the SDA’s database with periodic email reminders. A reminder flyer was sent two months after the initial data collection. Providers had their choice of taking a paper survey or an online survey hosted via SurveyMonkey. FCCPs without email addresses were also mailed a copy of the paper survey with a prepaid and addressed return envelope. Overall 20 (19.2%) of the FCCPs elected to take the paper survey.

For this first sample, embedded in informational emails to FCCPs was a link to the SurveyMonkey site. This web address was also listed on the flyers sent by mail. Providers electing to participate read through the online information and consented to participate by beginning the survey (Example consents in Appendix C). The IRB agreed to this procedure, as the only identifying information linking FCCPs to their survey would be the consent signature. The consent explained that to receive the incentive providers needed to email their name and mailing address to a staff member at UIUC listed at the end of the survey. The staff member did not have access to their survey responses. In this manner, providers that participated via email were able to receive their incentive, a $10 Wal-Mart gift card, while preserving the anonymity of responses in the survey.

If a provider did not receive a paper copy of the survey but wished to have a paper copy, a survey was mailed to her home. The UIUC staff member along with the SDA staff member collaborated to keep a list of survey identification (ID) numbers matched with the FCCP names and addresses. Surveys initially sent out to all FCCPs without emails (N = 48) were also tracked in this manner. Each mailed survey contained a folded prepaid and addressed return envelope marked with a survey ID. Once our research team received the survey in the mail, the UIUC staff member was notified of the survey ID number and she would mail that FCCP a gift card. A handful of providers filled out surveys while attending SDA events. These providers completed the consent form and survey in a private area. When the provider was finished, she sealed the envelope of the survey, which was already marked with an ID number, so it could be sent by mail to the research team. In this case, the SDA staff member was able to provide the incentive to the FCCP immediately and the survey was dropped in the mail for our research team. All paper surveys had a very similar consent procedure to the online surveys. Information about the study along with a consent form was included at the start of the packet. If the provider elected to fill out the survey after reading this information, beginning the survey was considered her consent to participate and she did not need to sign and return the form. Keeping the survey responses anonymous and voluntary should have minimized the amount of social desirability bias in the responses.

The second source of data for this first study was collected through an in-person data collection. The Illinois Institutional Review Board (IRB) again approved all research procedures and study measures.
(IRB # 14512; See Appendix A for Approval Letters). Through partnering with a different CCR&R, providers were recruited using an email listserv of providers from a central Illinois SDA from April 2015 to April 2016. A total of 508 providers were contacted, and 67 completed the in-person data collection to date leading to an approximate response rate of 13% for the second data collection. Some of these providers are actually co-providers ($n = 17$). As we are interested in understanding all the adults in this population, we decided to include these co-providers as well. In the anonymous survey study, we do not know for certain if any respondents were co-providers. With the in-person sample, we were able to access a greater percentage of African-American or Black providers (19.4% of the sample) than in the anonymous survey (4.1%). However, we still struggled to reach Hispanic/Latino providers (4.4% compared to 1.0%). We also were able to better access providers in the 18-29 year age bracket for the in-person study. This second in-person sample had a provider and child portion and a provider-only portion. For the more extensive provider and child portion, participants received a $40 Wal-Mart gift card for completing the study. Those who completed the provider-only portion received a $20 Wal-Mart gift card for the in-person provider only part of the study. In this in-person data collection, providers were asked the same survey questions as in the anonymous survey with additional questions about chronic diseases, sleep, and more detailed physical activity questions.

**Survey Measures.** Questions were asked from the 2013 and 2014 Center for Disease Control (CDC) Behavioral Risk Factor Surveillance System (BRFSS) survey. In this way, the FCCP sample could be compared to a matched, statewide sample. The BRFSS survey has been conducted for over 30 years and annually collects over half a million surveys; these surveys are conducted using land line and cell phones making the BRFSS the largest phone survey in the world as well as the gold standard for risk surveillance (Center for Disease Control, 2014a). All survey measures used in this study can be found in Appendix D.

**Demographic questions.** Questions helping to describe the demographic make-up of the FCCPs participating in the survey were from the Illinois Salary and Staffing Survey of Licensed Child Care Facilities (Wiley, Farber, Swartz, Ed, & King, 2011) and the BRFSS Survey (Center for Disease Control, 2013, 2014b). Demographic variables included age, gender, race/ethnicity, education, household income, marital status and health insurance status. These questions were also comparable to demographic questions asked in the American Community Survey (ACS) making it possible to assess the representativeness of this sample of FCCPs. The ACS takes place during years when the census, a survey of the entire population, is not being conducted. Each year 1% of the population (approximately 3.5 million households) is sampled with 5% of the population being sampled every five years before the random sampling starts over (U.S. Census Bureau, 2013).
**FCCP Practice descriptive questions.** Questions about FCCP’s practices included original questions as well as those previously used in the Illinois Salary and Staffing Survey (Wiley et al., 2011). Questions included length of time as an FCCP, ages of children currently enrolled, the number of children receiving child care assistance, and whether the FCCP participated in the Child and Adult Care Food Program.

**Weight Status.** Self-report height and weight questions from the BRFSS survey were used to assess weight status (Center for Disease Control, 2014b). Using the reported height and weight, body mass index (BMI) was calculated using the following formula: weight (lb) / [height (in)]² x 703. BMIs between 18.5 and 24.9 kg/m² were classified as normal weight, over 25 kg/m² and less than 30 kg/m² were overweight and over 30 kg/m² were considered obese. These cutoffs are consistent with the classifications of the BRFSS survey and CDC definitions (Center for Disease Control, 2015). Although women tend to somewhat underestimate their weight and slightly overestimate their height in self-report measures, self-report height and weight are considered to be valid (Brunner Huber, 2007).

**Insurance status and access to health care.** Questions related to provider’s insurance status and access to health care came from the BRFSS survey (Center for Disease Control, 2014) and the Illinois Salary and Staffing Survey (2011). Questions related to insurance included: whether providers have any insurance, who pays for it and whether prescription drug coverage is included. Access to health care questions included whether the provider has a personal doctor, whether the cost of health care prohibited doctor visits in the past year, if something other than cost delayed medical care, and length of time since last check-up. A question was also included about time since last dental visit from the BRFSS 2014 survey (Center for Disease Control).

**Perceived stress.** A global measure of perceived stress for FCCPs was assessed using the fourteen item Perceived Stress Scale (PSS-14; Cohen, Kamarck, & Mermelstein, 1983). The PSS-14 is noted for its simplicity and has been reliable and valid in a range of populations with junior high education or higher (Cohen et al., 1983). Participants were asked to think back over the past month and answer questions about the frequency of each item. For example, “in the past month, you felt nervous and stressed?” with responses ranging from “never” (0) to “very often” (4). The PSS-14 has also been used previously with both center and home-based child care providers (Groeneveld et al., 2012). It is important to note that chronic and acute stress can negatively impact cardiovascular health; however, these types of stress are modifiable CVD risk factors (Dimsdale, 2008). A separate measure was used as the BRFSS does not address stress.

**Smoking status.** FCCP smoking status was operationalized as current smoking frequency using the World Health Organization Global Adult Tobacco Survey (WHO, 2011) questions. Both smoking and exposure to secondhand smoke are adverse to the CV system (Raupach, Schäfer, Konstantinides, &
Andreas, 2006). These questions, while not yet subjected to validity or reliability testing, are credible as they have been used with over 3 billion people in 16 countries as a part of the Global Adult Tobacco Survey for surveillance purposes (Giovino et al., 2012).

**Nutrition status.** Items included related to nutrition status were from the BRFSS 2013 survey, addressing sugar-sweetened beverages consumption as well as fruit and vegetable intake (Center for Disease Control, 2013). These questions address areas of nutritional concern and represented possible places for intervention in the child care context (Gosliner et al., 2010). Fruit and vegetable intake are inversely related to CVDs (Dauchet, Amouyel, Hercberg, & Dallongeville, 2006). The six BRFSS fruit and vegetable questions have been shown to be a valid and reliable way to assess intake as compared to the traditional method of collecting multiple 24-hour recalls (M. Serdula et al., 1993; M. K. Serdula et al., 1995). Sugar-sweetened beverages are associated with weight gain and increased risk of CVDs (Park, Pan, Sherry, & Blanck, 2014). Although these specific items have not been tested, similar beverage questions have been shown to be both valid and reliable (Hedrick, Savla, & Comber, 2012).

**Physical activity.** Vigorous and moderate activity for FCCPs in the anonymous survey were assessed using the Global Physical Activity Questionnaire (GPAQ; WHO, 2014). Although a self-report measure, the GPAQ is considered to be a reliable and valid way to assess physical activity in adults (Helmerhorst, Brage, Warren, Besson, & Ekelund, 2012). In order to collect a bit more detail, physical activity questions from the BRFSS 2013 questionnaire were collected to determine whether providers were meeting aerobic and strength training guidelines (Center for Disease Control, 2013).

**Perceived general health.** Self-rated health (the perceived general health question) is related to cardiovascular events and is a valid, reliable, and reproducible indicator (van der Linde et al., 2013). In a study of Head Start providers, poor general health in providers was twice as frequently reported than in the matched population sample (Whitaker et al., 2013) making it an important indicator to explore for FCCPs.

**Emotional and instrumental support.** For this study, emotional support was assessed using a question from the BRFSS survey (Center for Disease Control, 2013). Face validity has been shown for this construct through repeated use of this measure by the BRFSS and its inverse relationship to poorer health outcomes (Strine, Chapman, Balluz, Moriarty, & Mokdad, 2008).

**Life satisfaction.** An item from the BRFSS 2013 questionnaire (Center for Disease Control, 2013) on overall satisfaction with life was used to assess perception of well-being for FCCPs. Dissatisfaction with life has been shown in the literature to be related to chronic conditions including greater cardiovascular risk factors (Li, Ford, Zhao, & Mokdad, 2009). This simple one question on satisfaction with life has been shown to have strong face validity as it increases with better psychological and physical health and decreases with worse health outcomes (Strine et al., 2008).
Sleep. A question asking about sleep duration was used from the BRFSS 2014 questionnaire (Center for Disease Control, 2014b). The cutoff used in recent CDC publications has been <7 hours of sleep or >7 hours of sleep (Centers for Disease Control and Prevention, 2011). Both higher and lower sleep durations than 7 hours per night have been associated with CVD (Sabanayagam & Shankar, 2010).

Chronic diseases. After preliminary analyses of the initial anonymous survey sample, health issues emerged leading to the addition of more detailed questions from the BRFSS about high blood pressure, high cholesterol and cholesterol screenings, diabetes, cardiovascular events (heart attack, angina or coronary heart disease, and stroke), asthma, chronic obstructive pulmonary disease (COPD), cancers (skin and other), arthritis and depressive disorders (Center for Disease Control, 2014b). For each of these conditions, FCCPs were asked whether a health care provider had ever told them that they had that chronic illness. As the Pennsylvania Head Start Study was one of the more recent studies on provider health to look at chronic diseases such as depression (Whitaker et al., 2013), a depression measure called the Center for Epidemiologic Studies Depression Scale (CES-D 20) was also used for comparison. The CES-D 20 is a valid and reliable measure of depression (Radloff, 1977). An example item is “during the past week, I felt I could not shake off the blues even with help from my family” with responses ranging from rarely or none of the time (0) to all the time (3).

Ethical Considerations. There were no significant risks associated with participation in this study. Participation did not increase the risk of emotional distress more than everyday life for most people. However, contact information for a local mental health organization and a crisis line number were provided in the consent forms. For the anonymous electronic version of the survey, a paid professional account on SurveyMonkey was used. Only the researchers had access to the password-protected data, maximizing security and confidentiality. SurveyMonkey safeguards email addresses, provides a secure and encrypted connection, and has had a third party, TRUSTe, examine and approve their privacy policies and practices. All electronic data were stored on a secure, password-protected university server. Paper surveys were stored in a filing cabinet in a locked office. Any information that linked the surveys to providers was kept with staff external to the research team for the anonymous portion of this data collection. Keeping the survey anonymous further protected FCCPs from any possible harm including preventing specific survey information from being accessed by CCR&R. Data from the in-person component of this study was kept equally secure.

Data analysis. All analyses on the analytic sample of 165 FCCPs were performed using SPSS v23. Analyses are addressed below by research question for clarity and organizational purposes.

RQ 1: How does the sample of FCCPs in this study compare demographically to FCCPs across the same state? A sample of likely FCCPs was pulled from the American Community Survey (ACS) 5-year data from 2010 to 2014 (Ruggles et al., 2010). The 5-year dataset was used instead of the 3-year or
1-year datasets because FCCPs represent less than 1% of the Illinois population. The ACS collects 1% of the population such that it can be weighted to represent the population for each Public Use Microdata (PUMA) region. The 5-year datasets, therefore, contain 5% of the population making them more reliable to use for such a specific population. Factors that were used to select for those who held the occupational code 4600 for Child Care Worker. Industry codes for child day care services (8470) or private households (9290) were selected next. Self-employed was selected as the type of class worker as well as having worked in the last year and been in the labor force. Only those over the age of 18 and with at least some high school were included. Since family income varied so widely, only those individuals within 2 standard deviations of the mean income were included. This excluded ~44 individuals (unweighted) that made over $184,074. The total unweight sample size was 1,115 representing 20,984 individuals in the state of Illinois who were self-employed and identified as working in child care, most likely FCCPs. There was no way to account for licensed vs. unlicensed.

For the BRFSS comparison sample Illinois, self-employed females with at least some high school education were selected as the sample from the 2013 and 2014 CDC data. Income ranges and race categories were fairly well represented for the state, although fewer Hispanic respondents were in the FCCP sample than the statewide sample. Although a few males participated in the FCCP data collection, the BRFSS Self-Employed data for the state of Illinois was over 60% male. As the FCCP sample was 93.3% female, males were excluded from the BRFSS samples to make it a better comparison group. In addition, incomes and education tended to be higher in the BRFSS samples. However, because some FCCPs did have incomes over $75,000 (20.0%) and some had graduated college (15.8%) it did not make sense to exclude these individuals from the statewide sample in the BRFSS. The unweighted samples were 148 and 143 respectively for 2013 and 2014 sample selections. The weighted samples were 231,651 and 233,418 respectively for 2013 and 2014. Descriptive statistics for the FCCP combined sample, two CDC samples, and ACS data were performed.

**RQ 2: What is the current health status of FCCPS and how does it compare to a matched sample?** Current health status of FCCs was assessed using the samples pulled from the BRFSS datasets discussed above with a few exceptions. Not all questions were asked in every state. States selected certain modules such as emotional support and satisfaction with life, which were questions only asked in Minnesota during 2014. Sugar-sweetened beverage questions were only asked in 14 states not including Illinois. These states included: Alaska, Arizona, Connecticut, District of Columbia, Kentucky, Louisiana, Maryland, Minnesota, Mississippi, South Carolina, Utah, Vermont, West Virginia, and Wisconsin. For these questions, the comparison group used was self-employed females with at least some high school education from the states participating in that BRFSS module. The person level final weights for landline and cell phone were used to make the samples representative. FCCPs were weighted at one and added as
new cases to the appropriate BRFSS dataset (either 2013 or 2014) for the purpose of performing statistical analyses across datasets.

All comparisons were divided into dichotomous categories either based on standard ways the CDC presents such factors or where differences between the samples were most pronounced. Pearson chi-square tests were used as long as cells had expected counts of over five. When expected cell counts were less than five, the Fisher’s Exact test was used instead, and p-values were reported. As the sample of FCCPs is of a moderate size, alpha was set at 0.05. Chi-square tests for the whole sample of FCCPs compared to the BRFSS data were performed for perceived general health, emotional support, life satisfaction, insurance status, access to health care, physical activity, smoking status, nutrition and weight status. On a subsample of 67 FCCPs compared to the BRFSS data, the chi-square tests were performed on meeting aerobic guidelines, meeting strength training guidelines, sleep, high blood pressure, high cholesterol, diabetes, heart attack, angina or coronary heart disease, stroke, asthma, COPD, cancers, arthritis, and depressive disorder diagnosis. As the Pennsylvania Head Start study had found such alarming rates for depression in this Head Start provider population (Whitaker et al., 2013), the CES-D 20 was added to a subsample of providers. Cronbach’s alpha for the CES-D 20 was 0.79 indicating good internal consistency.

**RQ 3: What factors relate to FCCPs having increased odds of overweight or obese weight status?** BMI was dichotomized into under/normal weight and overweight/obese for the outcome of these analyses. Two composites were made for these analyses. The first, “unhealthy eating,” was a composite score created by assigning one point to: 1) having one or more sugar-sweetened beverages, 2) less than one fruit per day, and 3) less than one vegetable per day. All providers with no points were coded as 0, and all providers with one or more points were coded as 1. Another composite score, “lack of access to health care,” was also created by assessing one point for not having each of the following: 1) a routine check-up in the last year, 2) insurance, 3) a personal doctor, 4) a doctor visit due to cost, and 5) delaying a doctor visit for a reason other than cost. Scores across the five items were then summed.

Perceived stress was determined by first reverse coding items that were positively worded. Scores ranged from 0, “Never”, to 4, “Very often.” Theoretically, summed scores could range from 0 to up to 56 with a high score corresponding to higher perceived stress. The mean score was 18.54. Cronbach’s alpha was 0.85 indicating good internal consistency for this scale. As there are no set criteria for cutoffs for the PSS-14, FCCPs were dichotomized based on being above or below the mean score of 18.54.

Correlations were performed for overweight or obese BMI with possible risk and protective factors. These factors included: unhealthy eating, not physically active, over average for perceived stress score, lack of access to health care composite, very satisfied with life and high on perceived emotional support. Only those that had significant Pearson correlations moved on to the logistic regression analyses.
Logistic regression was used to determine the factors related to higher odds of provider weight status being above the normal, BMI cutoff of over 25.0 kg/m\textsuperscript{2}. As data were missing on 3.92% of values across 30.12% of cases, multiple imputation using 100 imputations was used to complete the dataset before running the logistic regression analyses. In order to obtain Omnibus test for model coefficients, an aggregated dataset from the means of the 100 imputations was created. As this created several values that did not fall into the binary for the overweight or obese variable, values that were <0.50 were coded as 0 and values of ≥ 0.50 were coded as 1 for the next analyses. Binomial odds ratios were used to compare normal weight providers with overweight/obese providers for the three significantly correlated factors. Control variables for these analyses included age, SES, and race. Age was standardized based on the five categories described in the demographics table. As no continuous age variable was available for all providers and categories were not in even units at the end ranges, this standardization was necessary. The SES variable was created through summing the standardized sum of income and education, which were categorical variables. Since only 14.5% of the sample was a race or ethnicity other than Caucasian/white, a dichotomized variable was created. African-American/Black, Hispanic/Latino, and other races were coded as 0, and Caucasian/White was coded as 1. Model 1 included only control variables. Models 2 through 4 included control variables plus each of the three factors run separately. Model 5 includes all factors with controls. In Model 6, all risk factors were summed together to look at cumulative risk and run with control variables.

Results

A demographic comparison for FCCPs, Illinois Self-Employed Females with at least some high school for 2013 and 2014 BRFSS samples, and the sample of those likely to be FCCPs in the ACS 5-year survey from 2010 – 2014 are shown in Table 1. In the ACS sample, FCCPs were evenly distributed across 10-year categories from 18 – 59 but were less represented in the 60+ category. Only 12.7% fell in this category. The median age fell in the 40 – 49 years of age category, which was also true in the FCCP sample. The most notable age difference between the ACS sample and the FCCP sample in this study was that 18 – 29 year-olds were less likely to participate (5.5% compared to 21.8% in the ACS sample). In the BRFSS samples, a greater percentage fell into the 60+ category than was true for the FCCP sample or ACS sample of likely FCCPs. As for race or ethnicity, 85.5 of participating FCCPs were Caucasian or white, which was higher than in the ACS data for likely FCCPs (60.6%). Providers identifying as African American/black were less represented in the FCCP sample as were Hispanics/Latinos. The samples from the BRFSS were a closer match for race/ethnicity with the FCCP sample. FCCPs were more likely to have had some college at 50.3% than the ACS sample of likely FCCPs at 34.4%. The BRFSS samples were more likely to have graduated college than the FCCP sample. As for income, the FCCP sample was more likely to fall into the $35,000 to < $50,000 family income bracket than the ACS sample of those
likely to be FCCPs. In the ACS sample, family income was more likely to be $< 25,000 than in the FCCP sample. The BRFSS samples were more likely to have a family income over $75,000.

In the FCCP sample, 93.3% reported their gender as female, which was similar to 98.6% in the ACS sample. Only females were included in the BRFSS samples. As for marital status, the FCCP sample was more likely to be married (71.3%) than all three of the other samples. The ACS sample of likely FCCPs was more likely to have never been married (29.1%) compared to the FCCP sample (9.7%). The FCCP sample was also more likely to have health insurance at 92.1% compared to 72.2% in the ACS sample of likely FCCPs and 80.5% and 87.7% in the BRFSS 2013 and 2014 samples respectively. Household size of the FCCP sample was slightly larger at 3.6 than all three of the other samples, as was the number of FCCP children (1.6 children). The ACS sample was similar at a household size of 3.1, and 1.1 as the average number of children. The Illinois self-employed female sample was less likely to have children than the FCCP sample.

As a bit more detail about the FCCPs, a few practice descriptives have been included. Many providers in the sample had been in FCC for a long time with 37.9% reporting over 15 years as an FCCP. Almost half (48.8%) also cared for their own children. The average number of children currently enrolled was 8.66 (SD 3.78) with on average 2 children receiving child care assistance (SD 3.91). A majority of the FCCPs that participated were enrolled in the Child and Adult Food Program (CACFP; 89.66%).

Health characteristic comparisons between the FCCP sample and BRFSS Illinois self-employed females sample can be found in Table 2. As for general health, FCCPs were significantly more likely to have poor or fair health (p < 0.001) and significantly less likely to have excellent health (p < 0.001). FCCPs were also significantly less likely to answer that they always get needed emotional support (p < 0.001). When it came to access to health care, FCCPs were significantly more likely to have health insurance in this sample (p < 0.05), but no more likely to have a personal doctor or check-up in the last year. FCCPs were, however, significantly more likely to have delayed seeing a doctor due to cost (p < 0.001) or for a reason other than cost (p < 0.001). In addition, they were less likely to have visited a dentist in the past year (p < 0.01). FCCPs were just as likely to say that they participated in any type of physical activity at 74.55% and just as likely to be considered a current smoker at 9.82%. When it came to dietary patterns, FCCPs were just as likely to eat one or more vegetables per day and one or more sugar-sweetened beverages, but significantly less likely to eat one or more fruits per day at 57.69% compared to 70.79% (p < 0.001). On average, FCCPs had 2.21 vegetables per day (SD 1.63), 1.38 fruits per day (SD 1.35), and 0.44 sugar-sweetened beverages (SD 0.66). Finally, FCCPs were significantly more likely be overweight or obese at 70.78% compared to 48.43% in the matched sample (p < 0.001).
Table 1. Demographics for Family Child Care Providers, 2013 and 2014 BRFSS Illinois Self-Employed Females and ACS 5-Year data used to pull a sample with characteristics likely to be Family Child Care Providers.

<table>
<thead>
<tr>
<th></th>
<th>FCCPs from Both Samples (n = 165)</th>
<th>Illinois Self Employed Females from BRFSS 2013 (n = 231,651)</th>
<th>Illinois Self Employed Females from BRFSS 2014 (n = 233,418)</th>
<th>ACS 5-Year Likely Illinois FCCPs (n = 20,984)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-29</td>
<td>9 5.5</td>
<td>20,530 8.9</td>
<td>28,536 12.2</td>
<td>4,577 21.8</td>
</tr>
<tr>
<td>30-39</td>
<td>46 27.9</td>
<td>42,935 18.5</td>
<td>41,147 17.9</td>
<td>4,484 21.4</td>
</tr>
<tr>
<td>40-49</td>
<td>47 28.5</td>
<td>46,106 19.9</td>
<td>48,334 20.7</td>
<td>4,893 23.3</td>
</tr>
<tr>
<td>50-59</td>
<td>49 29.7</td>
<td>73,524 31.7</td>
<td>59,591 25.5</td>
<td>4,373 20.8</td>
</tr>
<tr>
<td>60+</td>
<td>14 8.5</td>
<td>47,779 20.6</td>
<td>51,532 22.0</td>
<td>2,657 12.7</td>
</tr>
<tr>
<td><strong>Race/Ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian/White</td>
<td>141 85.5</td>
<td>169,493 73.2</td>
<td>196,071 84.0</td>
<td>12,686 60.5</td>
</tr>
<tr>
<td>African-American/Black</td>
<td>17 10.3</td>
<td>14,533 6.3</td>
<td>11,048 4.7</td>
<td>4,409 21.0</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>4 2.4</td>
<td>29,905 12.9</td>
<td>15,774 6.8</td>
<td>2,896 13.8</td>
</tr>
<tr>
<td>Other</td>
<td>2 1.2</td>
<td>17,220 7.7</td>
<td>10,524 4.5</td>
<td>993 4.7</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some High School</td>
<td>2 1.2</td>
<td>5,968 2.6</td>
<td>2,579 1.1</td>
<td>1,253 6.0</td>
</tr>
<tr>
<td>Graduated High School</td>
<td>54 32.7</td>
<td>77,000 33.2</td>
<td>56,515 24.2</td>
<td>8,661 41.3</td>
</tr>
<tr>
<td>Some College</td>
<td>83 50.3</td>
<td>73,660 31.8</td>
<td>79,983 34.3</td>
<td>7,228 34.4</td>
</tr>
<tr>
<td>Graduated College</td>
<td>26 15.8</td>
<td>75,024 32.4</td>
<td>94,341 40.4</td>
<td>3,842 18.3</td>
</tr>
<tr>
<td><strong>Family Income</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;$25,000</td>
<td>16 9.7</td>
<td>47,064 20.4</td>
<td>17,274 7.4</td>
<td>5,991 28.6</td>
</tr>
<tr>
<td>$25,000 to &lt;$35,000</td>
<td>17 10.3</td>
<td>20,890 9.0</td>
<td>26,552 11.4</td>
<td>1,715 8.2</td>
</tr>
<tr>
<td>$35,000 to &lt;$50,000</td>
<td>47 28.5</td>
<td>20,364 8.8</td>
<td>35,811 15.3</td>
<td>3,340 15.9</td>
</tr>
<tr>
<td>$50,000 to &lt;$75,000</td>
<td>39 23.6</td>
<td>43,459 18.8</td>
<td>21,252 9.1</td>
<td>4,353 20.7</td>
</tr>
<tr>
<td>$75,000 or more</td>
<td>33 20.0</td>
<td>93,908 40.5</td>
<td>89,427 38.3</td>
<td>5,585 26.6</td>
</tr>
</tbody>
</table>
Table 1. (cont.)

<table>
<thead>
<tr>
<th></th>
<th>FCCPs from Both Samples (n = 165)</th>
<th>Illinois Self Employed Females from BRFSS 2013 (n = 231,651)</th>
<th>Illinois Self Employed Females from BRFSS 2014 (n = 233,418)</th>
<th>ACS 5-Year Likely Illinois FCCPs (n = 20,984)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Female</td>
<td>154</td>
<td>93.3</td>
<td>231,651</td>
<td>100.0</td>
</tr>
<tr>
<td>Married</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>117</td>
<td>71.3</td>
<td>153,399</td>
<td>66.2</td>
</tr>
<tr>
<td>Divorced</td>
<td>20</td>
<td>12.1</td>
<td>17,831</td>
<td>7.7</td>
</tr>
<tr>
<td>Widowed</td>
<td>8</td>
<td>12.1</td>
<td>9,851</td>
<td>4.3</td>
</tr>
<tr>
<td>Separated</td>
<td>1</td>
<td>0.6</td>
<td>13,642</td>
<td>5.9</td>
</tr>
<tr>
<td>Never Married</td>
<td>16</td>
<td>9.7</td>
<td>38,895</td>
<td>15.5</td>
</tr>
<tr>
<td>Member of an unmarried couple</td>
<td>2</td>
<td>1.2</td>
<td>255</td>
<td>0.1</td>
</tr>
<tr>
<td>Health Insurance</td>
<td>152</td>
<td>92.1</td>
<td>186,463</td>
<td>80.5</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Household Size</td>
<td>3.6</td>
<td>1.7</td>
<td>2.9</td>
<td>1.4</td>
</tr>
<tr>
<td>Number of Children</td>
<td>1.6</td>
<td>1.5</td>
<td>0.8</td>
<td>1.2</td>
</tr>
</tbody>
</table>
Table 2. Descriptive Statistics and chi-square tests for Family Child Care Providers (n=165) compared to a matched sample.

<table>
<thead>
<tr>
<th>General health</th>
<th>FCCPs n</th>
<th>% Yes</th>
<th>Illinois Self-Employed Females from BRFSS n</th>
<th>% Yes</th>
<th>χ²</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor or Fair Health</td>
<td>163</td>
<td>9.82</td>
<td>233,418</td>
<td>3.95</td>
<td>14.75</td>
<td>p &lt; 0.001</td>
</tr>
<tr>
<td>Excellent Health</td>
<td>163</td>
<td>12.27</td>
<td>233,418</td>
<td>28.32</td>
<td>20.68</td>
<td>p &lt; 0.001</td>
</tr>
<tr>
<td>Always get needed emotional support*a</td>
<td>161</td>
<td>32.92</td>
<td>118,383</td>
<td>56.48</td>
<td>36.31</td>
<td>p &lt; 0.001</td>
</tr>
<tr>
<td>Very satisfied with life*a</td>
<td>156</td>
<td>42.95</td>
<td>118,869</td>
<td>56.10</td>
<td>12.20</td>
<td>p &lt; 0.001</td>
</tr>
<tr>
<td>Access to health care</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health insurance</td>
<td>165</td>
<td>93.25</td>
<td>233,418</td>
<td>87.72</td>
<td>4.63</td>
<td>p &lt; 0.05</td>
</tr>
<tr>
<td>Personal doctor</td>
<td>162</td>
<td>88.89</td>
<td>233,418</td>
<td>84.70</td>
<td>2.19</td>
<td>p = 0.14</td>
</tr>
<tr>
<td>Check-up in last year</td>
<td>162</td>
<td>68.52</td>
<td>230,924</td>
<td>65.10</td>
<td>0.83</td>
<td>p = 0.36</td>
</tr>
<tr>
<td>Delayed doctor due to cost</td>
<td>159</td>
<td>19.50</td>
<td>229,554</td>
<td>10.26</td>
<td>14.73</td>
<td>p &lt; 0.001</td>
</tr>
<tr>
<td>Delayed doctor due to reason other than cost</td>
<td>149</td>
<td>39.60</td>
<td>212,223</td>
<td>16.79</td>
<td>55.41</td>
<td>p &lt; 0.001</td>
</tr>
<tr>
<td>Dentist visit in the last year</td>
<td>157</td>
<td>63.06</td>
<td>229,554</td>
<td>73.92</td>
<td>9.61</td>
<td>p &lt; 0.01</td>
</tr>
<tr>
<td>Physically active</td>
<td>165</td>
<td>74.55</td>
<td>233,418</td>
<td>78.40</td>
<td>1.45</td>
<td>p = 0.23</td>
</tr>
<tr>
<td>Current smoker</td>
<td>163</td>
<td>9.82</td>
<td>220,927</td>
<td>14.13</td>
<td>2.49</td>
<td>p = 0.11</td>
</tr>
<tr>
<td>Dietary patterns</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One or more vegetables per day*b</td>
<td>155</td>
<td>80.65</td>
<td>203,646</td>
<td>85.57</td>
<td>3.04</td>
<td>p = 0.08</td>
</tr>
<tr>
<td>One or more fruits per day*b</td>
<td>156</td>
<td>57.69</td>
<td>209,854</td>
<td>70.79</td>
<td>12.92</td>
<td>p &lt; 0.001</td>
</tr>
<tr>
<td>One or more sugar-sweetened beverages*c</td>
<td>156</td>
<td>17.31</td>
<td>854,760</td>
<td>20.81</td>
<td>1.16</td>
<td>p = 0.28</td>
</tr>
<tr>
<td>Overweight or Obese BMI</td>
<td>154</td>
<td>70.78</td>
<td>211,232</td>
<td>48.43</td>
<td>30.79</td>
<td>p &lt; 0.001</td>
</tr>
</tbody>
</table>

Note. 2014 data from Illinois Self-Employed Females with at least a high school level education where possible unless otherwise denoted. FCCPs = Family Child Care Providers, BMI = body mass index; BRFSS = Behavioral Risk Surveillance Survey.

*a Data for Illinois in 2014 were not available for these modules. As Minnesota was the only state to complete these modules, data from self-employed females with at least a high school education were used from this state as the comparison group.

*b 2014 data for these questions were not available for these modules so 2013 data were used instead.

*c Data for Illinois in 2014 were not available for this module. Data from self-employed females with at least a high school education were used from the following states who participated in this module in 2013: Alaska, Arizona, Connecticut, District of Columbia, Kentucky, Louisiana, Maryland, Minnesota, Mississippi, South Carolina, Utah, Vermont, West Virginia, Wisconsin.
Further health descriptives, including chronic diseases, can be found in Table 3 for a subsample of providers. FCCPs did not differ from the matched sample on average number of hours of sleep per night (6.83 vs. 6.98 respectively). When sleep was dichotomized into more than 7 hours of sleep, an important risk factor for CVD, significantly fewer FCCPs (56.06%) compared to the matched sample (69.41%) were meeting this sleep duration (p < 0.05). Approximately one in three providers reported having high blood pressure (35.82%), a number that was significantly higher than the matched sample (19.67%; p = 0.001). Of those with high blood pressure, 60.71% of providers were on medication compared to 74.03% of the matched sample. Significantly fewer FCCPs had ever had their cholesterol checked (78.18% compared to 88.81%; p < 0.05). Twelve providers answered “do not know” to this question. A similar number of FCCPs reported having high cholesterol compared to the matched sample. As for chronic diseases, diabetes was reported for 10.61% of providers, which was significantly higher than the matched sample (3.70%; p<0.05). The percentage increased to 18.19% when looking at FCCPs reporting having been told they have diabetes or pre-diabetes. No differences were seen for cardiovascular events including heart attack, angina or coronary heart disease or stroke. Approximately one in four providers reported having been told by a health care provider that they had asthma, which was significantly higher than one in ten in the matched sample (p < 0.001). Of those with asthma, approximately three-quarters of FCCPs and two-thirds of the matched sample still have asthma. No differences were seen for COPD, skin cancer or any other type of cancer. For FCCPs and the matched sample, approximately one in four had been told they had some form of arthritis.

Depressive disorders were 23.08% for FCCPs and 17.03% for the matched sample. The mean score for the CES-D 20 was 8.00 (SD 5.97) with five providers falling above 16, indicating a positive screen. Three of these providers did not have a diagnosis of depression, which would bring the percentage of FCCPs to 31.3% either having a diagnosis or positive screen for depression.

Overall, these results matched our hypothesis for RQ2 that FCCPs would have poorer health or health-related factors than the matched sample for general health, emotional support, satisfaction with life, delaying seeing a doctor due to cost or for another reason, one or more fruits per day, overweight or obese BMI, fewer than 7 hours of sleep per night, high blood pressure, diabetes, and asthma. FCCPs were significantly more likely to have insurance, which did not match our hypothesis. FCCPs were not statistically different for having a personal doctor or check-up in the last year, physical activity, smoking, one or more vegetables per day, one or more sugar-sweetened beverages, meeting guidelines for aerobic or strength training, high cholesterol, cardiovascular events, COPD, cancers, arthritis or depression.
Table 3. Descriptive Statistics and t-tests for subsample (n=67) of Family Child Care Providers compared to a Matched Sample.

<table>
<thead>
<tr>
<th></th>
<th>FCCP Subsample</th>
<th>Illinois Self-Employed Females from BRFSS</th>
<th>Chi-Square Test&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>% Yes</td>
<td>n</td>
</tr>
<tr>
<td><strong>Physical activity&lt;sup&gt;b&lt;/sup&gt;</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Met guidelines (150+ minutes per week)</td>
<td>63</td>
<td>41.27</td>
<td>200,031</td>
</tr>
<tr>
<td>Strength Training (2+ times per week)</td>
<td>55</td>
<td>34.55</td>
<td>202,632</td>
</tr>
<tr>
<td>More than 7 hours of sleep per night</td>
<td>66</td>
<td>56.06</td>
<td>233,418</td>
</tr>
<tr>
<td><strong>High blood pressure&lt;sup&gt;b&lt;/sup&gt;</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Currently on medication</td>
<td>28</td>
<td>60.71</td>
<td>45,571</td>
</tr>
<tr>
<td><strong>Ever had cholesterol checked&lt;sup&gt;b&lt;/sup&gt;</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High cholesterol</td>
<td>61</td>
<td>32.79</td>
<td>203,965</td>
</tr>
<tr>
<td><strong>Chronic Diseases</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes</td>
<td>66</td>
<td>10.61</td>
<td>230,681</td>
</tr>
<tr>
<td>Heart attack</td>
<td>66</td>
<td>1.52</td>
<td>230,681</td>
</tr>
<tr>
<td>Angina or coronary heart disease</td>
<td>66</td>
<td>3.03</td>
<td>230,681</td>
</tr>
<tr>
<td>Stroke</td>
<td>67</td>
<td>1.52</td>
<td>230,682</td>
</tr>
<tr>
<td>Asthma</td>
<td>65</td>
<td>27.69</td>
<td>230,682</td>
</tr>
<tr>
<td>Still have asthma</td>
<td>17</td>
<td>76.47</td>
<td>23,042</td>
</tr>
<tr>
<td>COPD</td>
<td>66</td>
<td>1.52</td>
<td>230,682</td>
</tr>
<tr>
<td>Skin cancer</td>
<td>67</td>
<td>2.99</td>
<td>230,681</td>
</tr>
<tr>
<td>Any type of cancer</td>
<td>67</td>
<td>1.52</td>
<td>230,681</td>
</tr>
<tr>
<td>Arthritis</td>
<td>67</td>
<td>23.88</td>
<td>230,682</td>
</tr>
<tr>
<td>Depressive disorder</td>
<td>65</td>
<td>23.08</td>
<td>230,681</td>
</tr>
</tbody>
</table>

<sup>Note.</sup> 2014 data from Illinois Self-Employed Females with at least a high school level education where possible unless otherwise denoted. FCCP = Family Child Care Provider, BMI = body mass index; BRFSS = Behavioral Risk Surveillance Survey; COPD = Chronic Obstructive Pulmonary Disease.<br>
<sup>a</sup>For variables with less than 5 in a cell for chi-square analyses, the Fisher's exact test was used instead.<br>
<sup>b</sup>Data for these questions were not available for these modules in 2014. 2013 data were used instead.
As overweight and obese rates were so high, it was important to look at potential factors that may be contributing to FCCPs having these higher weight statuses. Table 4 presents correlations between overweight or obese BMIs and possible risk factors, including unhealthy eating, lack of physical activity, higher than average perceived stress score (PSS-14) and lack of access to health care, as well as possible protective factors that lead toward resilience, such as being very satisfied with life and always getting needed emotional support. Neither of these protective factors was significantly correlated with overweight or obese weight status nor was lack of access to health care, which did not match our hypothesis for these factors. The remaining risk factors were significantly correlated which included unhealthy eating (p < 0.05), lack of physical activity (p < 0.01), and higher than average perceived stress scores (p < 0.05). These factors all had small to moderate Pearson r coefficients with overweight or obese weight status; however, these factors were not significantly correlated with one another.

Table 4. Person correlations for potential risk and protective factors related to overweight/obese FCCPs.

<table>
<thead>
<tr>
<th></th>
<th>Overweight or Obese BMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unhealthy eating(^a)</td>
<td>0.19*</td>
</tr>
<tr>
<td>Not physically active</td>
<td>0.22**</td>
</tr>
<tr>
<td>Higher than average perceived stress score</td>
<td>0.19*</td>
</tr>
<tr>
<td>Lack of access to health care composite(^b)</td>
<td>-0.06</td>
</tr>
<tr>
<td>Very satisfied with life</td>
<td>-0.06</td>
</tr>
<tr>
<td>Always get needed emotional support</td>
<td>0.02</td>
</tr>
</tbody>
</table>

\(^a\)Unhealthy eating is a composite score. Each of the following scored as one point: having one or more sugar-sweetened beverages, less than one fruits per day, less than one vegetable per day. Then this 0 to 3 score was dichotomized into 0 or 1 or more of these three factors to create unhealthy eating.

\(^b\)Lack of access to health care is a composite score. Not having each of the following scored as one point: a routine check-up in the last year, insurance, a personal doctor, seen the doctor due to cost, seen a doctor or delayed for reason other than cost.  
* p < 0.05, ** p < 0.01.

Logistic regression analyses for risk factors predicting overweight/obese weight status for FCCPs are presented in Table 5. These results agree with our hypothesis that poor dietary patterns or unhealthy eating would be related to higher weight status as would lack of physical activity and high stress. Control variables are included in model 1, including age, SES, and race; none of which were significantly related to increased or decreased odds of overweight/obese weight status and the model itself was not significant according to Omnibus test for model coefficients. The second model was significant as was the inclusion of not physically active (p < 0.05) to the controls. A higher than average perceived stress was run with the controls in model 3, which was significant (p < 0.05); however, the model was not significant. Unhealthy eating was significant (p < 0.05) when added to Model 4 with controls, but again the model itself was not significant. All three risk factors were added in with the controls for Model 5, which was a significant
model. Odds ratios increased at least slightly for all three risk factors, but especially for unhealthy eating. In this model, the odds of being overweight or obese significantly increase by 3.79 when FCCPs consider themselves not physically active compared to those that consider themselves as being physically active (p < 0.05) when controlling for age, SES, race and the two other risk factors. Providers with higher than average stress levels have significantly higher odds (p < 0.01) at 2.77 than those with lower than average stress for being overweight or obese with controls and the other two risk factors in the model. Finally, providers with one or more unhealthy eating behaviors have significantly higher odds (p < 0.01) at 3.05 of being overweight or obese with controls and the other two risk factors in the model. Since not being physically active had the highest odds ratio, our hypothesis that unhealthy eating would be the strongest predictor was not supported. Lastly, when looking at these three factors as cumulative risk, for every one unit increase in cumulative risk, the odds of FCCPs being classified as overweight or obese increases significantly (p < 0.001) by 3.09 times.
Table 5. Logistic regression analyses for factors related to overweight/obese weight status for FCCPs.

<table>
<thead>
<tr>
<th></th>
<th>Overweight or Obese</th>
<th>Overweight or Obese</th>
<th>Overweight or Obese</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model 1</td>
<td>Model 2</td>
<td>Model 3</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>SE B</td>
<td>OR</td>
</tr>
<tr>
<td>Age(^a)</td>
<td>0.23</td>
<td>0.18</td>
<td>1.26</td>
</tr>
<tr>
<td>SES(^b)</td>
<td>-0.07</td>
<td>0.12</td>
<td>0.57</td>
</tr>
<tr>
<td>Race(^c)</td>
<td>-0.42</td>
<td>0.55</td>
<td>0.66</td>
</tr>
<tr>
<td>Not physically active</td>
<td>1.31*</td>
<td>0.52</td>
<td>3.71</td>
</tr>
<tr>
<td>Higher than average</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>perceived stress</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>score</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cumulative Risk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>1.33**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(\chi^2)</td>
<td>2.62</td>
<td></td>
<td></td>
</tr>
<tr>
<td>df</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^a\)Age is a standardized score based on five categories.
\(^b\)SES = Socioeconomic status. SES was created from the sum of standardized income and education.
\(^c\)Dichotomous variable for race. 1=White 0=African-American/Black, Hispanic/Latino, Other.
\(^d\)Unhealthy eating is a composite score. Each of the following scored as one point: having one or more sugar-sweetened beverages, less than one fruits per day, less than one vegetable per day. Then this 0 to 3 score was dichotomized into 0 or 1 or more of these three factors to create unhealthy eating.
Table 5 (cont.)

<table>
<thead>
<tr>
<th></th>
<th>Model 4</th>
<th></th>
<th></th>
<th>Model 5</th>
<th></th>
<th></th>
<th>Model 6</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$B$</td>
<td>$SE$</td>
<td>$OR$</td>
<td>$B$</td>
<td>$SE$</td>
<td>$OR$</td>
<td>$B$</td>
<td>$SE$</td>
<td>$OR$</td>
</tr>
<tr>
<td>Age$^a$</td>
<td>0.20</td>
<td>0.18</td>
<td>1.23</td>
<td>0.17</td>
<td>0.19</td>
<td>1.18</td>
<td>0.17</td>
<td>0.19</td>
<td>1.19</td>
</tr>
<tr>
<td>SES$^b$</td>
<td>-0.07</td>
<td>0.12</td>
<td>0.94</td>
<td>-0.09</td>
<td>0.13</td>
<td>0.92</td>
<td>-0.08</td>
<td>0.13</td>
<td>0.92</td>
</tr>
<tr>
<td>Race$^c$</td>
<td>-0.43</td>
<td>0.55</td>
<td>0.65</td>
<td>-0.59</td>
<td>0.57</td>
<td>0.55</td>
<td>-0.59</td>
<td>0.57</td>
<td>0.55</td>
</tr>
<tr>
<td>Not physically active</td>
<td></td>
<td></td>
<td></td>
<td>1.33*</td>
<td>0.54</td>
<td>3.79</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Higher than average perceived stress score</td>
<td>1.02**</td>
<td>0.39</td>
<td>2.77</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cumulative Risk</td>
<td>0.93*</td>
<td>0.39</td>
<td>2.52</td>
<td>1.12**</td>
<td>0.42</td>
<td>3.05</td>
<td>1.13***</td>
<td>0.28</td>
<td>3.09</td>
</tr>
<tr>
<td>Unhealthy eating$^d$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.67</td>
<td></td>
<td></td>
<td>-0.05</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\chi^2$</td>
<td>8.03</td>
<td></td>
<td></td>
<td>23.23***</td>
<td></td>
<td></td>
<td>22.99***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$df$</td>
<td>4</td>
<td></td>
<td></td>
<td>6</td>
<td></td>
<td></td>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Discussion

As there is a dearth of research in this area, it is especially important to understand the representativeness of the sample of FCCPs that participated in the study by using ACS census data as a comparison. In the sample of FCCPs that participated in this survey, younger FCCPs are less represented, as are African-American/Black and Hispanic/Latino providers, and providers that have a family income of < $25,000. Interestingly, there were higher participation rates of younger providers and African-American/Black FCCPs for the in-person study than the anonymous survey. FCCPs in our sample of participants were also more likely to have had some college than the ACS sample. It is not surprising that FCCPs that were more educated, married, and had higher incomes were more likely to participate. The time and energy of FCCPs are so overstretched that it makes sense that those who chose to participate had potentially higher resources such as a marital partner or higher income level. It is important to understand, however, that the results could portray a healthier FCCP population than actually exists.

This is especially true given the shocking percentage of those likely FCCPs in the ACS sample who lack insurance. At 27.8%, roughly one in four FCCPs are uninsured in this sample. It is important to take into consideration these data were collected over five years. In the final year, 2014, the Affordable Care Act (ACA) was enacted increasing access to insurance for the general population. The ACA certainly shows an effect in the BRFSS data in that the 2013 sample had an uninsured rate of 19.5% and this dropped to 12.3% in the 2014 sample. Being careful to understand that the ACS dataset for 2014 only includes 1% of the population, the numbers for FCCPs do not look as hopeful. The estimated uninsured rate according to the ACS sample is 26.2% having dropped from 33.8% in 2010. The lowest estimate was in 2012 at 19.3%. With high turnover rates in this population, it is hard to know whether this 19.3% was an actual improvement in FCCPs becoming insured or whether FCCPs without insurance were exiting the field to pursue an occupation that provided benefits including health insurance. As small business owners with lower incomes, many FCCPs should qualify for insurance through the ACA, especially in Medicaid expansion states like Illinois. Overall the state of Illinois had an uninsured rate of 11.9% in 2014 (Center for Disease Control, 2014). The number of uninsured FCCPs is troubling and should be closely monitored to ensure that FCCPs are aware of changes and gain increased access to care.

Before considering the differences in health, it is also important to understand the underlying demographic differences for FCCPs in this sample compared to the BRFSS data. As FCCPs are self-employed, it was reasonable to compare them to this demographic in the BRFSS sample since being self-employed comes with its own stressors. For example, when it comes to insurance most have to purchase their own insurance or enroll in a spouses’ plan. This comparison revealed that the BRFSS group of self-employed females with at least some high school education tends to be a bit better off socioeconomically than FCCPs. Compared to the FCCP sample, the BRFSS samples for 2013 and 2014 were nearly twice as
likely to have graduated college and have family incomes of $75,000 or more. Among self-employment occupations, FCC tends to generate lower incomes which could account for some of this household income discrepancy. In addition, even with a higher education, FCCPs do not see as much of an increase in wages as would normally be seen with higher education levels in other fields. In the BRFSS sample, African Americans were less represented while 18 – 29 year-olds and those older than 60+ were more represented. The sample of FCCPs collected likely did not capture this younger group of 18 – 29 year-olds as effectively as other groups. This age group may be just starting in FCC and/or have young children making it more difficult and less likely for them to participate.

General health is one of the few categories of health measured in more than one of the previous studies on provider health. In this study, FCCPs were more likely to have poorer health and less likely to have excellent health. The traditional way to look at this general health question has been to look at those ranked as good to excellent health, which would be 90.18% for this sample of FCCPs. This percentage is consistent with the literature for child care provider health. Previous studies found the following for child care providers rating their health as good to excellent: 95% of FCCPs in Wisconsin (Gratz & Claffey, 1996), 86.8% for center providers in Georgia (Baldwin et al., 2007), 92% for home-based providers in New Zealand (McGrath & Huntington, 2007), and 85.4% for Head Start providers in Pennsylvania (Whitaker et al., 2013). It seems that FCCPs may rate their health slightly higher than center or Head Start providers. However, it would be helpful to know whether these other types of providers also tend to cluster toward the middle of the health question. Although ranking poor or fair health is alarming, in this study we see that providers are twice as likely to rate their health as poor or lower, but also less than half as likely to rate their health as excellent as the matched sample from the BRFSS data. It is significant that these providers are unable to rate their health as excellent and would be helpful to know if the same is true for Head Start and center providers in future studies. Studies have dissected how participants may make decisions regarding self-reported health and indicated that factors such as a person’s reference group, past health experiences, expectations and disposition could affect their evaluation of their own health (Jylha, 2009). In the case of providers, their reference group could be skewed leading them to interpret their health as better than it actually is. Life satisfaction for FCCPs was also high, which could have been related to artificially elevated self-rated health. In one study, lower life satisfaction was associated with lower self-health ratings (Strine et al., 2008). Self-rated health has been shown to relate to all cause mortality in a dose response fashion even after controlling for SES and several possible health covariates (Bopp, Braun, Gutzwiller, & Faeh, 2012). For this reason, further understanding of the variation in responses to this question, especially the lack of ability rate health as excellent, is warranted.

Positive factors such as emotional support and life satisfaction are increasingly recognized as relevant to our understanding of health (Strine et al., 2008). FCCPs were over 20% less likely to say that
they always get needed emotional support than the comparison group. A better understanding of who provides FCCPs with emotional support is needed in order to understand how to possibly bolster emotional support for FCCPs. As a particularly stressful profession, this is an area of concern for provider health. Providers were also over 10% less likely to report being very satisfied with life than the matched sample. Previous literature highlights that some providers recognized that caring for children can be satisfying (Slack-Smith et al., 2006). It would be helpful for future research to see if providers have higher life satisfaction if they believe that taking care of children is a satisfying career. In addition, thinking socio-ecologically, it would also be helpful to look at whether provider life-satisfaction is affected by societal perceptions of the value of their occupation. Previous literature highlights FCCP frustrations with the lack of respect and value given to their profession (Gerstenblatt et al., 2013).

Although FCCPs in this sample are more likely to have health insurance than the matched BRFSS sample, the ACS data on likely FCCPs told a different story. These data suggest that FCCPs are over 15.52% less likely to have insurance. Even with higher insurance rates, however, FCCPs are equally likely to have a personal doctor (88.89%) and to have had a check-up in the past year (68.52%). Two previous studies also looked at having a check-up in the past year. For Wisconsin FCCPs in the late 1990s, 77% had annual check-ups despite only 21% reporting having insurance, which was thought to be due in part to licensing standards requiring check-ups in the first year (Gratz & Claffey, 1996). Georgia child care providers reported having had a physical in the past year at a rate of 73% (Baldwin et al., 2007). In the state of Illinois, FCCPs are required to have a physical every two years to maintain their licensure. This may be why providers were equally likely to have had a check-up while twice as likely to have delayed seeing a doctor due to cost (19.50%) or for a reason other than cost (39.60%). The highest response for delaying medical care from the given choices was not able to get an appointment soon enough. Many FCCPs (22.1%), however, selected other for not seeing a doctor other than due to cost and wrote in a response instead. The responses written in the other category primarily fell into two categories. The first was due to constraints of their child care business; for example, not being able to take time off from child care, not able to find someone to cover for them, or not being able to close. The second was a general lack of time.

Similarly, FCCPs were about 10% less likely to see a dentist in the last year than the matched sample, which was probably for some of the same reasons they struggle to get to the doctor. Although the BRFSS sample was also self-employed, they did not have the same difficulties accessing care or visiting the dentist. For an FCCP to take a day off, they not only lose their source of income for the day, but taking a day off also makes parents of children in their care need to find alternative arrangements or lose their income for the day. Taking off a day jeopardizes a provider’s relationship with parents and therefore their business, which is clearly a significant concern for FCCPs.
FCCPs were just as likely to report being physically active as the matched sample. At 74.55%, this is higher than documented for Wisconsin child care providers. In that study, 38% of providers reported being physically active 3 or more times per week (Gratz & Claffey, 1996). However, when looking more in depth at physical activity, only 41.27% of FCCPs were classified as meeting the guidelines of 150+ minutes of aerobic activity per week. This is closer to previous findings. FCCPs were equally likely to meet aerobic and strength training guidelines as the matched sample. However, only 34.55% met the two or more times per week guidelines for strength training. As for smoking, FCCPs were just as likely to be classified as a current smoker (9.82%). This finding is similar to what the Australian study found about child care providers at 8% (Slack-Smith et al., 2006), Baldwin et al.’s study in Georgia at 11.6% (2007), and Gratz and Claffey in Wisconsin at 12% (1996).

As hypothesized, FCCPs were less likely than the matched sample to eat one or more fruits per day at 50.69%. The average number of fruits per day was 1.38 whole fruits or 100% fruit juices for FCCPs, whereas FCCPs were more likely to eat vegetables. Taken together providers had 3.59 fruits and vegetables per day. The CDC recommendations are 5-6 fruits and vegetables per day. The average FCCP is only 1.41 servings away from meeting this recommendation. None of the other studies on provider health to date have looked at specific dietary patterns in relation to provider health. Two studies did look at overall self-rating for nutrition. FCCPs in the Wisconsin study were more likely than center providers or directors to rate their nutrition as excellent; 72% of FCCPs rated their nutrition between good and excellent (Gratz & Claffey, 1996). In the New Zealand study, 89% of provider ranked their nutrition as good or excellent (McGrath & Huntington, 2007).

Notable in this comparison was the significantly higher rates of overweight or obese BMIs in FCCPs compared to the matched BRFSS sample. Just over 70% were classified as overweight or obese compared to just under 50% in the matched sample. For all females across the state of Illinois, 59.3% were classified as overweight or obese (Center for Disease Control, 2014b), which still puts FCCPs 10% above the state average. These alarming results are consistent with the previous literature. In 1996, before overweight and obesity rates were quite so high in the U.S., 72% of Wisconsin FCCPs self-reported as being overweight (Gratz & Claffey). As a point of reference, 44.3% of females in the state of Wisconsin were reported as overweight or obese at the time (Center for Disease Control, 1996). In Georgia, center providers had better health indicators all the way around including for BMI with 50.1% reporting being overweight or obese (Baldwin et al., 2007). However, 42.1% of this sample of center providers was 29 or younger, which could account for much of why these providers look healthier. They were also recruited using a health incentive. The first 200 participants received a book on Heart Health from the NIH, which also could have also helped to recruit healthier providers. In the Head Start study in 2014, 37% of providers were classified as obese (Whitaker et al.). For the obese category, 37.7% of FCCPs were
classified in this weight status for this study. In the recent FCC intervention, 74% of FCCPs in North Carolina were classified as overweight/obese (Østbye et al., 2014). These numbers are alarming and may imply a similar story to childhood obesity. Just as child care may be an added risk for obesity for children, it may also be the case that it is an added risk for child care providers. Further research will need to be done in this area in order to better understand whether it is child care or other factors that put providers in higher weight status categories.

These alarming numbers in preliminary analyses led to the inclusion of additional health factors for a later subsample. As for sleep, the average number of hours overall did not differ. However, using the cutoff of 7 or more hours per night as is used in the CDC’s reports (2011), FCCPs were over 10% less likely to exceed 7 hours compared to the matched sample. This specific sleep duration is important because sleeping less than 7 hours per night is associated with CVDs (Sabanayagam & Shankar, 2010). The only mention of sleep for providers in the literature on provider health was that 18% of providers in the New Zealand study complained of trouble falling asleep (McGrath & Huntington, 2007). With the often stressful and busy lives and given their role in caring for vulnerable children, it is important for these providers to get seven or more hours of sleep each night.

Several chronic diseases were concerning when looking at FCCP health. FCCPs were around 15% higher on being told by a health professional that they had high blood pressure compared to the matched sample. At 35.82% of providers reporting high blood pressure, these numbers were also higher than for than past literature. For Head Start providers, 22.3% reported having high blood pressure (Whitaker et al., 2013) and 12.4% of center providers reported having high blood pressure in the study conducted in Georgia (Baldwin et al., 2007). Fewer FCCPs reported ever having their blood cholesterol checked than the matched sample. Twelve of the FCCPs reported not knowing if they ever had their cholesterol checked. Cholesterol checks typically require fasting beforehand and could require a separate trip to the doctor. As discussed above, FCCPs had much higher rates of delaying care due to cost or for other reasons such as their child care business. Therefore, not knowing or not having ever had their cholesterol checked could be due to these types of barriers to not only getting needed care but also routine health care. High cholesterol was reported at very similar rates to the matched sample.

Diabetes was reported at higher rates as well with 10.61% reporting having been diagnosed and that went up to 18.19% when prediabetes was included. This is higher than in previous literature as well as 11.9% reported having diabetes or prediabetes in the Head Start Study (Whitaker et al., 2013) and 5.8% reported having diabetes in the Georgia study on center providers (Baldwin et al., 2007). Cardiovascular events, COPD, and having had cancer were similar across FCCPs and the matched sample. Asthma, however, was considerably higher than the matched sample. Just over one in four providers said they had been told by a health professional at some point that they had asthma and about

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three-quarters of those providers still have asthma. Head Start providers also had higher rates of asthma than their matched sample with 18.7% compared to 13.6% (Whitaker et al., 2013). Although not quite as high in Head Start, asthma should be further studied across different types of child care providers to see if these higher rates persist. Asthma could be an area that needs to be addressed for providers as it could impact their ability to facilitate outdoor activities that promote activity for children. The same could also be said for arthritis. Similar rates of arthritis exist in the FCCP subsample as in the matched sample. As almost one in four providers say they have been told by a health professional that they have some sort of arthritis, this may also need to be taken into account when considering how to help providers encourage active play and for the sake of the providers themselves.

Finally, depressive disorders were slightly higher, though not significantly so, compared to the matched sample. Almost one in four providers said they had been diagnosed with a depressive disorder. When looking at the CES-D 20 screening, six providers screened positive, and three of these had not reported being diagnosed with depression. These numbers are consistent with what was shown in the Head Start study where 23.5% had been diagnosed, 24.4% had a positive CES-D 20 screening leading to 37.0% having either been diagnosed with depression or a positive screen for it (Whitaker et al., 2013). Fewer FCCPs screened positive for depression than in the Head Start study. This may because the subsample used was not anonymous, but was more likely due to this subsample being collected as an in-person study. Providers with current depressive symptoms would be less likely to participate for this reason. A National Institute of Child Health and Development study looked at depression in non-parental caregivers using the CES-D 20 and found 9.4% of this sample to have a positive screen for depression (Hamre & Pianta, 2004). In our study, six providers currently screened positive, which would be 8.96% of our sample of FCCPs. Positive depression scores for non-familial caregivers have been shown to relate to less sensitive caregiving and seemingly more withdrawn interactions with children (Hamre & Pianta, 2004). It is not only important to find ways to support providers with current depression symptoms as well as those who have been previously diagnosed. Overall, these results on FCCPs compared to a matched sample along with the literature in this area provide reason for concern over the health and wellbeing of FCCPs.

Fortunately, the risk factors that significantly increased the odds of FCCPs being overweight/obese are all reasonably modifiable and good targets for intervention. Providers that classify themselves as doing no physical activity at all are at 3.79 times higher odds of being classified as overweight or obese. Future studies looking at ways that providers could increase their activity even just modestly during the day could be beneficial. Given the childhood obesity rates, finding ways providers and children could be active together could be an even better option. Providers that had higher than average perceived stress levels were at 2.77 times higher odds than providers below the average of being
overweight or obese. Perceived stress could be targeted in interventions by helping providers highlighted as problematic in the literature for FCCPs. For example providing ways to increase support networks and coping mechanisms for dealing with daily hassles associated with child care (Kontos & Riessen, 1993) as well as strategies for dealing with disrespectful parents and making the stress of work and home co-existing in the same space less stressful (Gerstenblatt et al., 2013). Unhealthy eating behaviors are also modifiable. To start, providers should aim to eat at least one fruit and one vegetable as well as consume less than one sugar-sweetened beverage per day. This is important since engaging in even one of these three unhealthy eating habits was related to 3.05 higher odds of being classified as overweight or obese. These areas are consistent with recommendations for the general population by the CDC; however, using data such as these to tailor interventions to providers is essential to targeting areas with the greatest impact for this population.

This study reaffirms that like other types of child care providers, FCCPs may be less healthy compared to a matched sample from the same region. Those who have worked with FCCPs know that they tend to be extremely busy and very giving towards the children in their care and the families of those children. As we saw noted in the literature, child care providers are unlikely to apply things they learn about children’s health to themselves (Calder, 1994). While work continues to be done in order to address the lack of financial compensation for child care providers, especially FCCPs (Whitebook et al., 2014), we can begin to show providers their value to us as a society by caring about their health and wellbeing in the same way we care about the children in their care.
Chapter Four: Study 2 – Family Child Care Providers’ Cardiovascular Risk and Protective Factors

Introduction

In the first study, providers were less healthy on multiple health indicators and were particularly high on risk when it came to overweight and obesity compared to a matched sample. Overweight and obesity can be related to long-term health problems; however, this is not always the case. As such, there are conflicting reports about using body mass index (BMI) classifications to measure health. For example, a recent article showed almost half of overweight and 29% of obese individuals were metabolically healthy while over 30% of normal weight individuals were metabolically unhealthy (Tomiyama, Hunger, & Wells, 2016). Therefore in this second study, more detailed measures of cardiovascular health were collected in order to determine how the high rates of overweight and obesity affect FCCP cardiovascular health. This second, in-person study collected anthropometric and physiological measures in addition to more in depth survey questions about cardiovascular health. Research questions for this study are descriptive as well as hypothesis-driven. Hypotheses are listed for those research questions extending beyond description.

RQ 1: What does a subsample of FCCPs look like demographically and what are the characteristics of their practice?

RQ 2: What is the cardiovascular risk for FCCPs over the next thirty years? How do providers compare to normal risk and optimal risk for their age and gender?

Hypothesis: Based on the literature, FCCPs are expected to have higher than normal and optimal 30-year cardiovascular risks.

RQ 3: Which cardiovascular risk and protective factors are related to 30-year cardiovascular risk for FCCPs? Are cumulative risk and cumulative protective factors related to FCCP CV risk? If so, do protective factors moderate risk factors for cardiovascular risk?

Hypothesis: Cardiovascular risk will be related to previously reported factors related to health behaviors, other factors related to health, and psychological risk and wellbeing, as well as proposed factors specifically related to FCCPs’ occupation. From these factors, factors with stronger relationships that are pooled into cumulative risk and protective scores will predict cardiovascular risk. Based on our theoretical model, cumulative protective scores will moderate the cumulative risk scores for FCCP 30-year cardiovascular risk.

RQ 4: What do more detailed measures of nutrition and physical activity for FCCPs reveal? Are they related to the shorter self-report measures?

RQ 5: What stage of change characterizes FCCPs regarding their nutrition and physical activity? How is stage of change related to demographic factors, perceptions of health and diet, stress, support, and influence on children in care?
Hypothesis: Based on poorer health outcomes in the literature for providers, FCCPs will be at earlier stages of change for fruits and vegetables and physical activity. Demographic factors related to lower SES and stress will be related to lower stages of change. Better perceived diet quality and health, as well as strong social support, will be related to higher stages of change. Perceptions of greater influence on children for eating and physical activity will be related to higher stages of change.

Methods

Sample. FCCPs in the second sample were part of the in-person data collection. They were recruited from the Child Care Resource Service (CCRS), part of SDA 10 headquartered in Champaign. This SDA reported 619 licensed FCCPs in the last Salary and Staffing Survey (Bruckner, Whitehead, Ernst, & Presley, 2013). The only selection criteria were that providers be licensed FCCPs and not be currently pregnant. We included assistants or co-providers as we were interested in capturing as much data as possible in this difficult to reach population. Co-providers spend a significant amount of time with children in FCC and they are also important for understanding how adult caretakers’ health could be affecting child health in the FCC setting. These co-providers also attend trainings, contribute to the FCC environment, and could be targeted for intervention in the FCC setting. There were 17 co-providers, about 25% of the sample. From this point forward, co-providers and main providers will be referred to as FCCPs.

The CCR&R aided in making FCCPs aware of our study through email, over the phone, during quality promoting van visits and at trainings. Two example flyers can be found in Appendix B. The listserv used to recruit had 508 names. We also utilized snowball sampling. The first thirty providers were recruited as part of the more in-depth data collection that included children, two visits and lasted approximately 4 hours. This commitment was disincentivizing for many providers so we revamped the data collection to include only essential provider data that could be completed in about one hour. This more targeted data collection was completed mostly at providers’ homes but was also utilized classroom spaces after or during a break during several child care training sessions. A total of 67 FCCPs were included in the analytic sample, which represents approximately 10% of the providers in this region.

Methodology. The University of Illinois’ IRB approved all portions of this study (IRB# 14512; See Appendix A for all approvals). Self-report and direct measurements were collected during these in-person visits. Providers completed one of the following two scenarios. In the full, more in-depth data collection:

1. A consent form and paper copy of In-Person Study Survey Part 1 (See Appendix C and Appendix D) were mailed to providers to complete prior to the visit if the provider decided to consent to participate. When this was not possible, FCCPs were asked to complete it at the very beginning of
the first visit. The survey part 1 had self-report measures of cardiovascular risk factors such as height and weight, insurance status, whether diagnosed with diabetes, etc.

2. After survey part 1 was completed, direct measures of cardiovascular health were measured through physiological assessments of height, weight, percent body fat, fat-free mass, total cholesterol, high-density lipoprotein, random glucose, and glycosylated HbA1c.

3. Providers were asked to wear an accelerometer for at least 10 hours a day for four days including one weekend day. During this time, they were also asked to complete a survey (See Appendix D). This survey included demographic questions and psychological scales.

4. The second visit occurred at least four days after the first. At that time, accelerometers were collected as well as survey responses to a second part of the survey. At this visit, FCCPs also completed an automated self-administered 24-hour food recall (ASA24) online using a laptop brought by the researchers. When Wi-Fi was unavailable, a hotspot was setup. After all measures had been completed, the FCCP was given a $40 Wal-Mart gift card. FCCPs also received a Heart Health Report with the results from their physiological measures and a packet of reputedly-sourced informational materials related to heart health and stress.

The second scenario was similar but shortened.

1. FCCPs were first given the consent for the study. If they consented, providers were asked to complete a pre-survey, which was a shortened version of survey 1 given in the more in-depth study.

2. After the pre-survey had been completed, providers completed direct measures of cardiovascular health as listed in step 2 above.

3. Providers completed the main survey, which was a combination of questions from survey 1 and 2 mentioned above.

4. After completing the survey and all direct measures of health, providers received a $20 Wal-Mart gift card and a Heart Health Report.

**Measures.** The procedures for all direct measures and information about all survey measures are listed below.

**Anthropometrics** (height and weight). Height was measured using a Seca 213, portable stadiometer that had been confirmed for conformity (Vogel, 2014). The Health o meter (Model 349KLX) electronic scale was used to measure weight. This scale meets ISO 13485:2003 quality management requirements (Pelstar LLC, 2013). The scale was zeroed out each time it was turned on and checked using a 1kg-standardized weight. Height and weight were measured twice each, and an average of the two values was taken.
**Body composition.** The InBody 230 Body Composition Analyzer, a portable instrument using direct segmental multi-frequency bioelectrical impedance method, was used to determine percent body fat and fat-free mass, which allowed the InBody to calculate basal metabolic rate. The InBody 230 collects ten measurements of each arm, leg and the trunk using frequencies at 20 kHz and 100 kHz. According to the manufacturer, these measurements give an accurate body fat percentage and total fat-free mass (Biospace, 2008). This has also been validated in the literature by the gold standard for body composition, dual X-ray absorptiometry (Karelis, Chamberland, Aubertin-Leheudre, & Duval, 2013).

Before beginning the InBody measurements, a short survey was provided to ensure providers do not have a pacemaker and to record items that could affect the measurement (See Appendix A). Typically a four-hour fast as well as forgoing showering, exercise for 12 hours, and caffeine is requested. However, in order to fit the schedules of as many providers as possible morning and afternoon were made available, making these requirements too much to ask of FCCPs. We collected these answers on half of the providers to help judge the accuracy of the data collected. The following were reported by 36 of the FCCPs before their InBody measurements were taken: 86.1% had eaten in the past four hours, 4.6% had exercised within 12 hours, 19.4% had alcohol in the last 24 hours, 63.9% had caffeine that day, 47.2% had put on lotion that day, 19.4% had taken a shower in the past 4 hours, and 14.3% were on their menstrual cycle. For the InBody measurement, FCCPs were directed to follow manufacturer’s directions by taking off their shoes and socks, wiping their hands and feet with an InBody tissue and stepping onto the InBody with their heel at the back of each electrode. Arms were held out at approximately 15 degrees while lightly holding the handles with thumb and fingers covering the electrodes. Results populated in approximately 30 seconds and were printed on a portable printer.

**Blood pressure.** After a 5-10 minute sitting rest period, three blood pressure measurements were taken using the Omron digital HEM-907 XL machine (IntelliSense, 2015). The averages of measures two and three were taken as has been previously described in the literature (Weir et al., 2009). Providers were asked not to talk and to sit with their feet touching the floor, back against the chair and were provided with a solid surface to rest their right arm comfortably. The Omron digital automated blood pressure machine has been validated using the Association for Advancement of Medical Instrumentation criteria (White & Anwar, 2001). During blood pressure measurements, resting heart rates were also collected. The second and third measures were averaged. Blood pressure was of particular importance to measure as high blood pressure over the life course is related to pathophysiological changes in cardiac function and structure (Ghosh et al., 2014).

**Total Cholesterol and High-Density Lipoprotein.** Capillary blood samples (30 μL) obtained using a finger stick (using Unistik 3 Extra Safety Lancet; 21 gauge, 2.0 mm depth) were used to measure FCCP total cholesterol (TC) and high-density lipoprotein (HDL). The CardioChek PA Analyzer (Pts
Diagnosicts, 2014) was used to measure non-fasting TC, HDL cholesterol, and TC/HDL ratio. The CardioChek PA has been shown to be reliable and valid for cardiovascular screening purposes (Matteucci, Bartola, Rossi, Pellegrini, & Giampietro, 2014). Previously in the literature, concerns over the variability of the Cardiochek were documented (Whitehead, Ford, & Gama, 2013); however, these measurements were taken in 2010. Since that time, another paper has shown that Cardiochek PA has reduced the variability of their results over the course of three years from 2011 to 2013 to meet US National Cholesterol Education Program (NCEP) requirements (Matteucci et al., 2014). Ranges for HDL measurable by the Cardiochek include 15 mg/dL to 100 mg/dL and for TC include 100 mg/dL to 400 mg/dL. However, values closer to the edges of these ranges were likely to be less accurate. The package insert for TC and HDL strips state the average coefficient of variation for TC ranged from 1.94% to 2.92% and HDL ranged from 1.73% to 3.01%. These precision measures meet NCEP requirements. Controls for TC and HDL were run with each new lot number of strips per the manufacturer’s instructions. Before each use, the device check strip was tested to ensure the CardioChek PA was properly functioning. Strips were turned over and evaluated for complete and even coloring to make sure enough blood was applied.

As most FCCPs are small business owners, time off is rare. Point-of-care technologies such as the CardioChek PA made it possible for us to collect valuable biological data on-site without undue burden on participants. The literature has documented that non-fasting lipids differ little from fasting lipids for total cholesterol and HDL (Sidhu & Naugler, 2012). As we went to providers homes at differing times of the day, including in the afternoon, and had providers that participated in the evenings after trainings, it was impractical to ask FCCPs to fast for these measures. Glucose and Glycated Hemoglobin A1c (HbA1c). Capillary blood samples were typically obtained from the same finger stick as for cholesterol were used for measuring these two values for diabetes risk. Random glucose (1 μL) and HbA1c (5 μL) measures required very small blood samples. As using only one stick was not always possible, FCCPs were warned through the consent process that a second finger stick could be necessary. By using the Unistik 3 Extra lancets, which go a bit deeper at 2.0mm rather than the normal depth of 1.8mm, most of the time this was a one-stick procedure, alleviating added discomfort. These lancets were one-use safety lancets meaning that once the needle was triggered it could not emerge a second time, which provided added protection for the FCCP and the researcher. The first drop of blood was discarded, as recommended for each procedure. The A1cNow+ point-of-care analyzer was used to measure HbA1c (Chek Diagnositics, 2014). It does not require fasting and has been shown to be both accurate and reliable (Matteval, Aldasouqi, Solomon, Gossain, & Koller, 2007). A1CNow+ is 99% accurate on average when compared to certified reference lab measures and has been certified by the National Glycohemoglobin Standardization Program (NGSP; pts Diagnostics, 2015).
The precision of the A1CNow+ reports a coefficient of variation of 3.0% to 4.01% meeting these NGSP standards. HbA1c is a marker of glucose homeostasis and has been shown to be independently associated with cardiovascular diseases (Ashraf, Boroumand, Amirzadegan, Talesh, & Davoodi, 2013; Singer, Nathan, Anderson, Wilson, & Evans, 1992). The disposable A1CNow+ Monitor performs its own internal chemical and electronic control checks on over 50 quality checkpoints and reports an error code if a quality check is not passed.

A random glucose level was collected for each FCCP as well. Random glucose has recently been looked at retrospectively in the Framingham study with associations to all-cause mortality even at the high end of normal ranges (Tang, Saith, Al Memari, Aldhaheri, & Kohut, 2014). As a random glucose is cost-effective and easy to collect, these data were helpful to collect in order to see whether they are beneficial to measure for FCCPs. A professional-use glucose meter was used to assess random glucose using biosensor technology of a 1 μL sample (Germaine Laboratories, 2015). The meter has a measurement range of 20 to 600 mg/dL. High and low controls were run per manufacturer’s instructions.

**Nutrition 24-hour dietary recall.** A subsample of FCCPs entered their responses into an account on the Automated Self-administered (ASA) 24-hour Recall through the National Cancer Institute. Responses were stored and analyzed through an account set-up by the research team (National Cancer Institute, 2014). As 24-hour recalls provide valuable nutrition information with minimal bias, the National Cancer Institute has developed a way that researchers can set up a study online for their respondents for free to maximize the cost-effectiveness of nutrition data collection in studies. Researchers helped respondents go to a link provided for this particular study, entered in unique usernames and passwords and helped them through the guided 24-hour recall by an animated penguin (Subar et al., 2012). In 2012, over 300 research studies used this nutrition assessment (Ahuja, Moshfegh, Holden, & Harris, 2013). The ASA 24 has been shown to be a reliable and valid assessment (Moshfegh et al., 2008). It also creates multiple types of analysis files for download including files on total nutrient values for foods reported all in one day and MyPyramid Equivalents for foods reported by day. The later was turned into Healthy Eating Index (HEI) variables to create an overall score using a pre-created SAS code file in SAS 9.4 which was exported to excel and merged into the SPSS v22 data file. The HEI 2010 has updated the index to the newer dietary guidelines and is considered a valid and reliable measure of overall diet quality (Guenther et al., 2014).

**Physical activity level.** Objectively measured physical activity was assessed on a subsample of thirty providers using accelerometry. The ActiGraph wGT3X-BT Monitor collected motion in three axes and the cut-offs previously established for adults in the literature were used to analyze the data (Matthew, 2005). FCCPs were instructed to wear the ActiGraph monitor during waking hours on their hip for at least ten hours a day for four days. Between three and fives days are required for adequate physical activity.
data in adults for overall activity level (Trost, Mciver, & Pate, 2005). However, we were unable to get providers to wear the accelerometer for at least three days for ten hours. Future studies with greater resources should be sure to have daily reminders, a longer wear time period, and a greater incentive contingent on completing necessary wear time; all of which have been recommended in the literature for better adherence (Ward, Evenson, Vaughn, Rodgers, & Troiano, 2005). As we were unable to assess overall physical activity, we looked at sedentary, light, moderate and vigorous activity for at least one 10-hour workday. If more than one 10-hour workday was available, the average of those days was used. Any non-weekdays or days with less than 10 hours were dropped from further analyses. On average, there were 2.14 days (SD 0.89) for an average of 12.65 hours per day (SD 1.52) for a total of 28 providers.

ActiGraph has been shown in the literature to be valid and reliable (Berggren, Hulver, Dohm, & Houmard, 2004). The recommended method by the manufacturer was used to determine cut points for moderate and vigorous activity, as well as energy expenditure. This formula (Freedson, Melanson, & Sirard, 1998) is well supported by over 1300 citations in the literature.

**Survey measures.** This sample included several questions described for the prior study. These questions include those from the BRFSS 2014 on age, sex, marital status, race, household income, household size, number of children, general health, physical activity in the past 30 days, fruit and vegetable consumption module, sugar-sweetened beverage module, sleep, not seeing a doctor due to cost, health insurance, satisfaction with life, and the asthma, arthritis and depression questions from the chronic disease module (Center for Disease Control, 2014). In addition, the modules for self-reported diagnoses of diabetes, hypertension, hypertension medications, high cholesterol, and depression were included from the BRFSS 2013 survey (Center for Disease Control, 2013). Questions added from the Salary and Staffing Survey included: hours worked per week, education, whether another adult contributed to the household income, types of financial assistance, personal earned income, have another job besides child care, have a child care assistant or co-provider, whether the provider participates in the Child and Adult Care Food Program (CACFP), whether worked as center provider, whether cares for own or relative’s children, who pays for health insurance, number of years in child care, considering exiting child care, number of children on child care assistance, vacancies in enrollment, and number of hours paid per week for child care (2013). An additional question about whether providers would choose child care as a career again was added from a national study of child care providers (Early Childhood Longitudinal Study -Birth Cohort, 2005).

In addition, the Brief Resilience Scale, a reliable measure that has shown convergent and discriminate validity, was used to assess general resilience (Smith et al., 2008). Childhood SES was measured using the highest reported parental education level before age 17. This technique has been used effectively in a study looking at the Midlife in the United States (Miller et al., 2011). Additionally, the
Multidimensional Scale of Perceived Social Support (MSPSS) subscales for friends and family was used as a valid and reliable way of assessing FCCP support (Zimet, Dahlem, Zimet, & Farley, 1988). An adapted subscale for friends was added to assess support from at least one other child care provider. The PSS-14, as previously mentioned, was used to measured perceived stress (Cohen, 1983). An adapted version of the sedentary activities questions was used from the International Physical Activity Questionnaire (Booth, 2000; Craig et al., 2003; The IPAQ Group, 2002). The following measures were used from the USDA’s measures: the short food security scale (Blumberg, Bialostosky, Hamilton, & Briefel, 1999), self-reported diet quality (National Health and Nutrition Examination Survey, 2011), and health beliefs about food (United States Department of Agriculture, 1996). Stage of change for physical activity was determined using a four-item self-report measure (Marcus & Lewis, 2003) and stage of change for fruits and vegetables was assessed through a similar four-item self-report measure (Di Noia, Mauriello, Byrd-Bredbenner, & Thompson, 2012). The influence FCCPs believe they have over children in their care for food preferences, eating habits, and physical activity was assessed using three previously published questions (Kim et al., 2011).

Cardiovascular risk scores were measured through the Framingham Risk Score for the next 30-years (FRS30) for cardiovascular disease (Pencina, D’Agostino, Larson, Massaro, & Vasan, 2009). An online risk assessment tool at https://www.framinghamheartstudy.org/risk-functions/cardiovascular-disease/30-year-risk.php#, which estimates the 30-year risk of having a cardiovascular event, was used to calculate each FCCP’s FRS30. This risk assessment is created using a multi-equation algorithm predicting all cardiovascular events such as myocardial infarction, coronary death, coronary insufficiency, angina, ischemic stroke, hemorrhagic stroke, transient ischemic attack, peripheral artery disease, or heart failure. Two algorithms create separate predictions using the following overlapping factors: age, sex, systolic blood pressure, blood pressure medication, diagnosis of diabetes and smoking status. To obtain the FRS30 lipid (FRS30L) based score, total cholesterol and HDL were also needed and to obtain the FRS30 BMI (FRS30B) based score BMI was needed. BMI was measured by the Inbody 230 as described previously measures unless it was not available due to operator error in which case it was calculated based on weight and height as follows: weight (lb) / [height (in)]² x 703. A question about family history of a heart attack for mother or father was adapted based on the Framingham risk scores.

**Ethical Considerations.** No substantial risks to providers occurred in this project beyond those of everyday life. The direct measures of cardiovascular health were taken in a safe area of the child care home out of reach of children by a trained research assistant. It was our experience that participants, after rapport was established, typically enjoy participating. Informed Consent was obtained via an IRB-approved and date-stamped consent form. Participants were clearly informed about the voluntary nature of the research and the general purpose. No deception was involved. Overall, the IRB classified the
project in its safest category, "no more than minimal risk." If a participant needed assistance, the number for a local mental health center and a hotline were listed in the consent. For those providers with out-of-range physical health measures, they were referred to their primary care physician. All providers were given a list of local health resources, including free clinics for those without health insurance, which could be used to follow-up with after the study. All paper data were transported immediately back to the research office, contained only participant codes and were stored in a cabinet in the locked research office. The roster relating names and codes was kept separately in the locked office. All electronic data were stored on a secure, password-protected university server. IRB policies and procedures for data safety were followed closely. While there were no reasons to expect that participation would involve any data or safety risks to participants, we monitored the implementation carefully and frequently. Although no problems occurred, any problems would have been reported to the IRB and the dissertation committee immediately.

**Data Analysis Plan.** All analyses were performed using the Statistical Package for the Social Sciences, Version 23 except for the HEI, which was run using Statistical Analysis System, Version 9.4. Analyses are addressed by research question for clarity and organizational purposes.

**RQ 1: What does a subsample of FCCPs look like demographically and what are the characteristics of their practice?** A description of provider demographics, as well as practice characteristics, was created based on frequencies and descriptives in SPSS.

**RQ2: What is the cardiovascular risk for FCCPs over the next thirty years? How do providers compare to normal risk and optimal risk for their age and gender?** Cardiovascular risks for FCCPs were calculated using the online calculator for the FRS30 for BMI based and lipids based risk scores. Three participants fell one or two years outside the recommended age range (19, 60, and 61 years). The FRS30 is most appropriate for those 20-59 years of age. However, as other risk factor calculators have even smaller recommended ranges, and the ages were within one or two years, we included these providers. While this could affect accuracy of estimates, the scores for these individuals were comparable to scores of participants of a similar age. In addition, it is recommended that this risk calculator not be used for those with cardiovascular events or cancer. The following cardiovascular events and cancers were reported by providers: one had a heart attack, two had angina or coronary heart disease, one had a stroke, two had skin cancer, and one had another type of cancer. Although not ideal, in order to look at all participants using the same metric, these providers were included as well. The scores for these individuals may underestimate their actual risk.

On the website with the FRS30 calculator, optimal and normal values were generated for each FCCP according to their age and gender. These optimal and normal values were subtracted from each FCCP cardiovascular risk score to determine the percentage “over normal” and percentage “over optimal”
for FCCPs. FCCPs could have higher, lower, or the same risk as the optimal risk. These scores were recoded into 0 (zero or less) and 1 (anything greater than zero) to determine the percentage of providers at higher than normal or higher than optimal risk. Mean percentages, standard deviations, and ranges were calculated where applicable. Overall variance for FRS30B and FRS30L was also calculated. Descriptives for other risk factors related to cardiovascular health including HbA1c, random glucose, percent body fat, basal metabolic rate, total cholesterol to HDL ratio, diastolic blood pressure, resting heart rate and self-reported general health were also determined. Correlations between these variables and the FRS30B and FRS30L were performed to help determine which risk score would be most representative of FCCP cardiovascular risk to use for further analyses. In addition, to determine if there were any inherent differences between main providers and co-providers for FRS30B or FRS30L, independent sample t-tests were run showing that the means for providers and co-providers were no different for the FRS30B (p = 0.25) nor the FRS30L (p = 0.27).

**RQ3:** Which cardiovascular risk and protective factors are related to 30-year cardiovascular risk for FCCPs? Are cumulative risk and cumulative protective factors related to FCCP CV risk? If so, do protective factors moderate risk factors for cardiovascular risk? Cardiovascular risk and protective factors were prepared as follows for correlations with 30-year cardiovascular risk. For physical activity, a dichotomous variable was created (physically active in the last month or not). Sedentary time was determined by calculating hours per sedentary behavior and then summing the total hours across all categories. The upper tertile of providers fell at the level of those who were sedentary more than 9 hours a day. Therefore, the sedentary risk factor was coded as less than 9 hours equals 0 and over 9 hour equals 1. Unhealthy eating was calculated in the same way as described in the first study. It was a composite score created by assigning one point to the following: having one or more sugar-sweetened beverages per day, less than one fruit per day, and less than one vegetable per day. All providers with no points were coded as 0, and all providers with one or more points were coded as 1. As in the first study, sleep was dichotomized at 7 hours. A dichotomized variable was also created for not seeing a doctor due to cost.

Family history of a heart attack was coded as yes if the FCCP’s mother or father had a heart attack before age 60 and no if neither parent had a heart attack or had reached the age of 60. Asthma, arthritis and depression were coded as a simple yes or no based on whether the respondent had been told by a health professional that the respondent had any of these diseases. Low food security was determined based on the USDA’s 6-item short form and coded into very low, low, or high/marginal food security according to the instructions provided by the USDA: [http://www.ers.usda.gov/datafiles/Food_Security_in_the_United_States/Food_Security_Survey_Modules/short2012.pdf](http://www.ers.usda.gov/datafiles/Food_Security_in_the_United_States/Food_Security_Survey_Modules/short2012.pdf). As none of the providers in our sample were “very low food secure”, “low food secure” was used as a risk factor cutoff. Those with low food security were classified as one and those with
high/marginal food security were classified as zero. Lower childhood SES was coded one if neither parent had more than a high school graduation education level when the provider was 17 years of age or less.

The overall scale for the PSS-14 was scored as described in the last chapter. For this sample, Cronbach’s alpha was 0.84. Because there are no set cutoffs for the perceived stress score, several were tried to see what best fit in this population. Dichotomous variables were created for above or below the mean score, lower tertile, and upper tertile. Higher stress variables were not related to the FRS30. However, lower stress was negatively related. Following up on these results, low stress was correlated with other protective factors such as the brief resilience scale and satisfaction with life. Low stress significantly correlated with these other factors leading to its inclusion as a possible protective factor.

The six-item brief resilience scale was created according to the literature by reverse coding items 1, 3, and 5 and then taking the average across the six items (Smith et al., 2008). The average score was 3.68 (SD 0.74) and a Cronbach’s alpha of 0.89. To create a cutoff, those that had an average score over 4.0, which corresponded to “agree” and included “strongly agree” were coded as one and labeled “perceive self as having resilience.” Those responding with an average score less than 4, corresponding to selecting answer responses related to neutral, disagree or strongly disagree, were coded as zero.

The MSPSS for friends, family and at least one other child care provider (the adapted version of the friends subscale) were scored using the average from each set of four items where at least three of the four items were present (Zimet et al., 1988). The average score for the friends subscale was 5.48 (SD 1.32) with Cronbach’s alpha of 0.93, the family subscale average was 5.72 (SD 1.17) with α =0.83, and the adapted scale for at least one other child care provider subscale average was 5.19 (SD 1.60) with α = 0.97. In order to then look at strong sources of support for providers, each source of support was dichotomized into strong support (≥ 6 corresponding to strongly agree or very strongly agree on average) or less than strong support (< 6 corresponding to mildly agree, neutral, mildly disagree and strongly disagree on average). Those providers that had at least one type of strong support (family, friends or at least one other child care provider) were coded as one and those providers without any sources of strong support were coded as zero.

Additional measures included satisfaction with life, with very satisfied coded as one and all other responses to the CDC question coded as zero. Having one or more children receiving child care assistance was coded as one and having none was coded as zero. Consideration of exiting the child care field in the last year was used in its original form as a yes or no question. Vacancies in enrollment patterns of sometimes, often or always were coded as one and rarely or never as zero. Hours worked per week were coded based on the upper tertile of those providers working over 55 hours per week, coded as one, compared to the lower two-thirds, which was coded as zero. As many FCCPs have co-providers, some providers participated with their co-providers in this study. In order to determine if having a co-provider
was protective, having a co-provider was coded as one and not having one was coded as zero. Finally, those that strongly agreed to the statement that they would choose a child care career again were coded as one and those who answered a response that was less than strongly agree were coded as zero.

Due to the modest sample size, variables significant at p < 0.10 were included in consideration for the cumulative risk or cumulative protective scores. Variables that met this threshold were summed into cumulative risk or protective scores. The individual variables were checked to make sure they significantly correlated with the cumulative scores at the p < 0.05 level. These finalized cumulative scores were standardized. This was necessary as cumulative risk and cumulative protective scores contained a different number of factors.

The finalized variables underwent missing values analysis before multiple imputation to complete the dataset for multiple regression. A total of nine values were missing (1.03%) across eight cases. To ensure accurate convergence on missing values, 100 imputations were run before proceeding with analyses. SES was created after multiple imputation as income was missing on one or more providers. Standardized scores for income and education were summed together to create the SES variable. In order to obtain standardized betas, $R^2$ values and $F$ change for $R^2$ values, an aggregated dataset was created using the mean values in SPSS. Age and sex were not included as control variables for these analyses as they were already accounted for in the creation of the FRS30B scores. Multiple regression predicting FRS30B was run in a series of models with control variables, cumulative risk with controls, cumulative protective score with controls, cumulative risk and protective scores with controls and then again with the addition of an interaction term to look at cumulative protective factors as a moderator of risk (cumulative risk X cumulative protective factors). The interaction was decomposed using the standard procedure described by Aiken and West (1991). Regression coefficients, standard errors, and degrees of freedom were pulled from the model with the interaction term. A covariance matrix was added to this analysis to obtain the covariance for the interaction term with risk. A constant was created and added to the regression model. The default setting is to include a constant in SPSS so this setting was turned off in order to pull the covariances. These values were used to decompose the interaction term and determine the simple slopes using the following website: http://www.quantpsy.org/interact/mlr2.htm (Preacher, Curran, & Bauer, 2006). As the cumulative risk was standardized, the x values were given as -1, 0, and 1 since these represented the mean and one standard deviation below and above the mean as meaningful points to plot for x. The same was true for the cumulative protective score, so -1, 0, and 1 were used as meaningful conditional values of z. The y-axis, FRS30B, was not centered or standardized since it was more meaningful to interpret it as a percentage. The plot for the interaction graph is based on the points produced in quantpsy.org but was recreated in Microsoft Excel.
RQ 4: What do more detailed measures of nutrition and physical activity for FCCPs reveal? Are they related to the shorter self-report measures? Physical activity (measured by accelerometry) and diet quality (measured by the HEI generated from a 24-hour dietary recall) provided greater information about activity and nutrition in a subsample of providers. These measures were also used to assess how well shorter provider self-report measures fared. Recalls from the ASA24 were downloaded from the ASA24 website. The files INFMYPHEI and TNMYHEI were used along with the SAS code to create the HEI 2010 components and total score. The HEI 2010 includes 12 components and is a measure of diet quality as it relates to recommendations by government organizations (Guenther et al., 2013). Average scores were divided by maximum scores for each component in order to examine what percentage of points FCCPs received per component on average. In addition, the CDC’s fruit and vegetable module was used to create variables for total fruits per day (sum of whole fruit and 100% fruit juices per day), total vegetables (sum of greens, beans, orange, and other vegetables per day), greens and beans (sum of greens and beans per day), and fruits and vegetables per day (sum of total fruits and total vegetables per day). These CDC measures were correlated with the HEI total score.

For the actigraph data, ActiLife 6 Data Analysis Software using the batch data analysis and the Freedson et al. cut points were used to calculate sedentary, light, moderate and vigorous activity for a subsample of FCCPs (n = 29). In general, wear time was easily determined using estimated wear time calculations (Troiano et al., 2007). However, when comparing logs of wear time along with calculated wear times, segments during what would have been likely nap times for children sometimes came up as non-wear times. These segments, when indicated as part of providers’ logs wear times, were selected as wear times rather than the calculated non-wear time. After removing weekend days and weekdays with less than 10 hours, FCCPs had on average 2.14 days (SD 0.89) ranging from 1 day to 4 days for an average of 12.65 hours per day (SD 1.52).

Self-reported physical activity was assessed using the CDC’s 2013 calculations for the BRFSS. These calculations were used to assess two reported activities along with their reported times spent and frequencies per week. FCCPs who responded “no” to being active in the past month and did not provide at least one activity (> 10 minutes) were classified as having 0 minutes of moderate or vigorous activity per week. Activities were assigned metabolic equivalent (MET) values based on those listed in the calculated variables document (http://www.cdc.gov/brfss/annual_data/2013/pdf/2013_calculated_variables_version15.pdf). Max VO2 was calculated for males (60 – 0.55*age) and females (48 – 0.37*age). Functional capacity was calculated as FC60 = (0.60*MaxVO2)/3.5. Functional capacity was used to determine activity levels based on assigned MET levels to activities (“not moderate or vigorous” 0 to 2.99, “moderate” > 3.0 but < FC60, and “vigorous” > FC69). Minutes per activity multiplied by times per week of activity greater than 10
minutes were calculated for vigorous and moderate activities. Total time for moderate and vigorous activities was created from the sum of the two activities for each. For the purposes of classifying providers into categories, vigorous minutes were multiplied by two, as is specified by the CDC. Total minutes of activity were classified into highly active (> 300 minutes), active (150 to 299 minutes), insufficiently active (0 to 149 minutes), and inactive (0 minutes). Strength training was assessed as two or more times per week or fewer than two times per week. Further descriptive information from sedentary time analyses was also added to this portion of analyses.

**RQ 5: What stage of change characterizes FCCPs regarding their nutrition and physical activity?**

How is stage of change related to demographic factors, perceptions of health and diet, stress, support, and influence on children in care? The stage of change measures for physical activity and fruit and vegetable consumption (4 questions) were categorized into the following stages: precontemplation, contemplation, preparation, action, and maintenance (Di Noia et al., 2012; Marcus & Lewis, 2003). Descriptive statistics of provider stages, as well as correlations with possible factors related to those stages of change, were conducted. In addition, to further explore providers’ health beliefs, descriptives were also conducted for the seven USDA questions on beliefs related to eating.

**Results**

Demographics of the FCCP sample including practice descriptives are presented in Table 6. The median age of providers was 40 to 49 years of age. Approximately three-quarters of FCCPs identified as Caucasian or white and one-fifth as African-American or Black. Hispanic or Latino identifying providers made up 4.5% of the sample and the remaining 1.5% were “other.” Half of the FCCPs in the sample had some college coursework, and 17.9% had graduated college. The remaining 29.9% of providers had graduated high school and 1.5% had some high school but did not graduate. The majority of providers were female (91.0%). Most FCCPs also reported being married (68.7%) with never married being the next highest (16.4%). Being divorced was reported by 10.4% and widowed by 4.5%. The median household income was in the $35,000 to $50,000 bracket, and 85.1% of FCCPs reported another adult contributing to this household income. Some form of financial assistance such Medicaid or food stamps were reported by 43.3% of providers. Over $1,000 of personal income earned from child care each month was reported by 68.7% of providers. Some FCCPs also reported having another job besides child care (16.4%). A majority of FCCPs reported being a part of the Child and Adult Care Food Program (CACFP; 95.5%). Recall that one quarter (25.4%) of providers were child co-providers rather than the main provider in their FCC home. More than half said that they previously worked as a center provider (58.2%). Many providers also reported taking care of their own children (56.7%) and/or their relative’s children (26.9%). Almost all FCCPs in this sample had health insurance (97.0%). Most providers reported
Table 6. Demographics of Family Child Care Provider Sample

<table>
<thead>
<tr>
<th>Category</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-29</td>
<td>6.0</td>
<td>9.0</td>
</tr>
<tr>
<td>30-39</td>
<td>21.0</td>
<td>31.3</td>
</tr>
<tr>
<td>40-49</td>
<td>15.0</td>
<td>22.4</td>
</tr>
<tr>
<td>50-59</td>
<td>21.0</td>
<td>31.3</td>
</tr>
<tr>
<td>60+</td>
<td>4.0</td>
<td>6.0</td>
</tr>
<tr>
<td><strong>Race/Ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian/White</td>
<td>50.0</td>
<td>74.6</td>
</tr>
<tr>
<td>African-American/Black</td>
<td>13.0</td>
<td>19.4</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>3.0</td>
<td>4.5</td>
</tr>
<tr>
<td>Other</td>
<td>1.0</td>
<td>1.5</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some high school</td>
<td>1.0</td>
<td>1.5</td>
</tr>
<tr>
<td>Graduated high school</td>
<td>20.0</td>
<td>29.9</td>
</tr>
<tr>
<td>Some college</td>
<td>34.0</td>
<td>50.7</td>
</tr>
<tr>
<td>Graduated college</td>
<td>12.0</td>
<td>17.9</td>
</tr>
<tr>
<td><strong>Female</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>46.0</td>
<td>68.7</td>
</tr>
<tr>
<td>Divorced</td>
<td>7.0</td>
<td>10.4</td>
</tr>
<tr>
<td>Widowed</td>
<td>3.0</td>
<td>4.5</td>
</tr>
<tr>
<td>Never married</td>
<td>11.0</td>
<td>16.4</td>
</tr>
<tr>
<td><strong>Household income</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$15,000 to &lt;$20,000</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>$20,000 to &lt;$25,000</td>
<td>2.0</td>
<td>3</td>
</tr>
<tr>
<td>$25,000 to &lt;$35,000</td>
<td>4.0</td>
<td>6</td>
</tr>
<tr>
<td>$35,000 to &lt;$50,000</td>
<td>24.0</td>
<td>35.8</td>
</tr>
<tr>
<td>$50,000 to &lt;$75,000</td>
<td>17.0</td>
<td>25.4</td>
</tr>
<tr>
<td>$75,000 or more</td>
<td>11.0</td>
<td>16.4</td>
</tr>
<tr>
<td>Don’t know/Not sure</td>
<td>5.0</td>
<td>7</td>
</tr>
<tr>
<td><strong>Another adult contributes to household income</strong></td>
<td>57.0</td>
<td>85.1</td>
</tr>
<tr>
<td><strong>Receives financial assistance</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>29.0</td>
<td>43.3</td>
</tr>
<tr>
<td><strong>Personal earned income (child care)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;$1000 a month</td>
<td>20.0</td>
<td>29.9</td>
</tr>
<tr>
<td>&gt;$1000 a month</td>
<td>46.0</td>
<td>68.7</td>
</tr>
<tr>
<td>Don’t Know</td>
<td>1.0</td>
<td>1.5</td>
</tr>
<tr>
<td><strong>Another job besides child care</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11.0</td>
<td>16.4</td>
</tr>
<tr>
<td>Table 6. (cont.)</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>------------------</td>
<td>-----</td>
<td>------</td>
</tr>
<tr>
<td>CACFP (Food program)</td>
<td>64.0</td>
<td>95.5</td>
</tr>
<tr>
<td>Child care co-provider</td>
<td>17.0</td>
<td>25.4</td>
</tr>
<tr>
<td>Worked previously as a center provider</td>
<td>39.0</td>
<td>58.2</td>
</tr>
<tr>
<td>Care for own children</td>
<td>38.0</td>
<td>56.7</td>
</tr>
<tr>
<td>Care for relative's children</td>
<td>18.0</td>
<td>26.9</td>
</tr>
<tr>
<td>Health insurance</td>
<td>65.0</td>
<td>97.0</td>
</tr>
<tr>
<td>Health insurance payer?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spouse's employer pays 100%</td>
<td>5.0</td>
<td>7.5</td>
</tr>
<tr>
<td>Spouse's employer pays partial amount</td>
<td>19.0</td>
<td>28.4</td>
</tr>
<tr>
<td>Purchase own insurance</td>
<td>9.0</td>
<td>13.4</td>
</tr>
<tr>
<td>Medicaid/Medicare eligible</td>
<td>20.0</td>
<td>29.9</td>
</tr>
<tr>
<td>Other</td>
<td>14.0</td>
<td>19.4</td>
</tr>
<tr>
<td>Don't know</td>
<td>1.0</td>
<td>1.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>M</th>
<th>SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of years in child care</td>
<td>10.6</td>
<td>9.7</td>
</tr>
<tr>
<td>Hours paid for child care work per week</td>
<td>52.4</td>
<td>20.3</td>
</tr>
<tr>
<td>Household size</td>
<td>3.9</td>
<td>1.7</td>
</tr>
<tr>
<td>Number of children in household</td>
<td>1.7</td>
<td>1.5</td>
</tr>
</tbody>
</table>

*Note. CACFP = Child and Adult Care Food Program.*
receiving their insurance through Medicaid or Medicare (29.9%) or that their spouses’ employer paid a partial amount (28.4%). The average number of years providers had been in FCC was 10.6 years with providers ranging from just starting in the last year to working over 35 years in FCC. On average, FCCPs spent 52.4 hours per week on FCC, but this had a wide range as well. These numbers are fairly similar to the Illinois Salary and Staffing Survey, which averaged 13.4 years and 53.1 hours per week for FCCPs (2013). The average household size was 3.9 people, and the average number of children was 1.7.

Table 7 presents descriptives for variables included in the FRS30B and FRS30L (cardiac risk BMI and lipid scores). Hypertension medications are used by 25.4%, 10.4% have been diagnosed with diabetes, and 7.5% of FCCPs were current smokers. The average systolic blood pressure was 118.0 mmHg, and the average BMI was 30.6 kg/m². Total cholesterol on average was 185.5 mg/dL, and HDL was on average 56.8 mg/dL.

Table 7. Descriptives for variables that are part of one or more of the Framingham 30 Year Cardiovascular Risk Scores

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension Medication</td>
<td>17</td>
<td>25.4</td>
</tr>
<tr>
<td>Diagnosed with Diabetes</td>
<td>7</td>
<td>10.4</td>
</tr>
<tr>
<td>Smoke</td>
<td>5</td>
<td>7.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systolic Blood Pressure (mmHg)</td>
<td>118.0</td>
<td>17.0</td>
<td>92 - 171</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>30.6</td>
<td>7.4</td>
<td>18.1 - 65.8</td>
</tr>
<tr>
<td>Total Cholesterol (mg/dL)</td>
<td>185.5</td>
<td>39.1</td>
<td>113 - 308</td>
</tr>
<tr>
<td>High Density Lipoprotein (mg/dL)</td>
<td>56.8</td>
<td>17.8</td>
<td>18 - 91</td>
</tr>
</tbody>
</table>

Note. BMI = Body Mass Index.

As for cardiovascular risk, FCCPs were on average at a 21.85% risk of having a cardiovascular event in the next thirty years according to the FRS30B and 27.09% on the FRS30L (See Table 8). The FRS30B had greater variance than FRS30L for this FCCP sample. As hypothesized, FCCPs were higher than normal and optimal for both FRS30B and FRS30L. FCCPs were 10.58% higher than normal risk for their age and gender for the FRS30B, but only 2.71% were higher than normal risk for the FRS30L. For FRS30B, 73.13% were classified as being over normal risk. FRS30L was lower at 40.30% being classified as over the normal risk. Compared to the optimal risk, FCCPs were on average 13.57% points over the optimal risk for their age and gender for FRS30B and 10.99% over for the FRS30L. The percentage classified as over the optimal risk, for age and gender, using the FRS30B was 86.57% and using the FRS30L was 80.60%. FRS30B and FRS30L correlated with an \( R^2 \) of 0.89. HDL and total cholesterol were not correlated with FRS30B, and BMI was not correlated with FRS30L.
Table 8. Descriptive Statistics for FCCP BMI and Lipid Framingham 30-Year Risk Scores as well as FCCP risk compared to normal and optimal risk scores

<table>
<thead>
<tr>
<th></th>
<th>M (%)</th>
<th>SD</th>
<th>Range</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BMI Risk Score (FRS30B)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FCCP risk minus Normal risk</td>
<td>21.85</td>
<td>18.73</td>
<td>1 – 72</td>
<td>432.81</td>
</tr>
<tr>
<td>Percent of FCCPs Over Normal Risk</td>
<td>73.13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FCCP risk minus Optimal risk</td>
<td>13.57</td>
<td>15.2</td>
<td>-4 – 55</td>
<td></td>
</tr>
<tr>
<td>Percent of FCCPs Over Optimal Risk</td>
<td>86.57</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Lipid Risk Score (FRS30L)</strong></td>
<td>27.09</td>
<td>20.8</td>
<td>2 – 81</td>
<td>350.83</td>
</tr>
<tr>
<td>FCCP risk minus Normal risk</td>
<td>2.71</td>
<td>12.62</td>
<td>-19 – 37</td>
<td></td>
</tr>
<tr>
<td>Percent of FCCPs Over Normal Risk</td>
<td>40.30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FCCP risk minus Optimal risk</td>
<td>10.99</td>
<td>14.55</td>
<td>-6 – 51</td>
<td></td>
</tr>
<tr>
<td>Percent of FCCPs Over Optimal risk</td>
<td>80.60</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. FCCP = Family Child Care Provider; FRS30B = Framingham Risk Score - 30 Years - Body Mass Index; FRS30L = Framingham Risk Score - 30 Years - Lipids; BMI = Body Mass Index.

Correlations with other factors that are typically related to cardiovascular disease, obesity or diabetes are included in Table 9. HbA1c was on average at 5.56% (SD 1.28%) and had a significant, medium Pearson correlation with both FRS30B (p < 0.01) and FRS30L (p < 0.05), though it was a bit stronger of an association with FRS30B. Random glucose levels were on average at 114.55 mg/dL (SD 43.21) and had a medium correlation with only FRS30B (p < 0.01). Percent body fat also had a significant medium correlation with FRS30B (p < 0.05) and was on average 38.24% (SD 8.92). Basal metabolic rate (BMR) had significant correlations with both FRS30B (p < 0.05) and FRS30L (p < 0.01). BMR was on average 1,435.97 kcals (SD 212.01). Total cholesterol:HDL ratio was of course significantly correlated with FRS30L since it was part of this risk score (p < 0.01), but it was also significantly correlated at medium correlation with FRS30B (p < 0.05). Diastolic blood pressure was on average at 77.30 mmHg (SD 12.12) and was significantly correlated at a medium level with both FRS30B (p < 0.01) and FRS30L (p < 0.01). Resting heart rate was on average 76.53 beats per minute (SD 10.02), however, it was not correlated with either risk score. General health using the self-report question was significantly, negatively correlated with FRS30B (p < 0.05) and FRS30L (p < 0.05) at a medium level. In other words, as general health was rated higher, cardiovascular risk was lower. Based on these results, the FRS30B was selected as the best for this population of FCCPs for cardiovascular risk as it significantly correlated with seven out of eight related cardiovascular factors.
Table 9. Descriptive Statistics for other cardiovascular factors and their correlation with the Framingham 30-Year Risk Scores for BMI and Lipids

<table>
<thead>
<tr>
<th>Factor</th>
<th>M</th>
<th>SD</th>
<th>FRS30B</th>
<th>FRS30L</th>
</tr>
</thead>
<tbody>
<tr>
<td>HbA1c (%)</td>
<td>5.56</td>
<td>1.28</td>
<td>0.38**</td>
<td>0.29*</td>
</tr>
<tr>
<td>Random glucose (mg/dL)</td>
<td>114.55</td>
<td>43.21</td>
<td>0.32**</td>
<td>0.22</td>
</tr>
<tr>
<td>% Body fat</td>
<td>38.34</td>
<td>8.92</td>
<td>0.30*</td>
<td>0.17</td>
</tr>
<tr>
<td>Basal metabolic rate (kcal)</td>
<td>1,435.97</td>
<td>212.01</td>
<td>0.30*</td>
<td>0.32**</td>
</tr>
<tr>
<td>Total cholesterol: HDL ratio</td>
<td>3.59</td>
<td>1.38</td>
<td>0.30*</td>
<td>0.49**</td>
</tr>
<tr>
<td>Diastolic blood pressure (mmHg)</td>
<td>77.30</td>
<td>12.12</td>
<td>0.35**</td>
<td>0.37**</td>
</tr>
<tr>
<td>Resting heart rate (beats per min)</td>
<td>76.53</td>
<td>10.02</td>
<td>-0.02</td>
<td>-0.01</td>
</tr>
<tr>
<td>General health self-report question</td>
<td>3.31</td>
<td>0.80</td>
<td>-0.26*</td>
<td>-0.27*</td>
</tr>
</tbody>
</table>

Note. FRS30B = Framingham Risk Score - 30 Years - Body Mass Index; FRS30L = Framingham Risk Score - 30 Years - Lipids; BMI = Body Mass Index; HbA1c = Hemoglobin A1c; HDL = High Density Lipoprotein.

*p < 0.05, **p < 0.01.

Table 10 presents potential risk and protective factors correlated with FRS30B. For potential health behavior risk factors, as hypothesized, not being physically active in the last month had a small correlation (p = 0.06), as did unhealthy eating (p = 0.06) and not seeing a doctor due to cost (p = 0.08). Contrary to our hypothesis, sedentary activity of over nine hours and sleeping less than seven hours per night did not correlate. Under other health related risks, arthritis had a medium correlation (p < 0.001). Also differing from our hypothesis, lower SES as a child had only a small correlation (p = 0.10), while family history of heart attack, asthma, and low food security were not correlated. For psychological factors, as hypothesized, there was a medium, negative correlation with low stress (p < 0.05), a medium, positive correlation with a depression diagnosis (p < 0.05) and a small, negative correlation with very satisfied with life (p = 0.05). Low stress and very satisfied with life were considered protective factors. Contrary to our hypothesis, “perceive self as having resilience” or having at least one source of strong support did not correlate significantly with FRS30B. Factors related to FCCPs’ child care business included a small, negative correlation with would choose a child care career again (p = 0.06), a protective factor, which went along with our hypothesis. Having children on child care assistance, consideration of exiting the child care field in the last year, vacancies in enrollment, working over 55 hours per week and having a least one child care co-provider were not significantly correlated with FRS30B, which did not align with our hypothesis. Risk factors that went into the cumulative risk score included: not physically active in the last month, unhealthy eating, not seeing a doctor due to cost, arthritis, and depression diagnosis. All factors correlated with the cumulative risk score at a medium to large association strength (p < 0.001). The only significant correlations amongst these risk factors included a small correlation between depression diagnosis and not seeing a doctor due to cost (p < 0.05) and a medium correlation...
between depression diagnosis and arthritis diagnosis (p < 0.05). Cumulative protective factors included being very satisfied with life, would choose a child care career again, and low stress. These factors all had large correlations at the p < 0.001 level. Being very satisfied with life had a medium correlation with low stress (p < 0.001).

Multiple regression results predicting FRS30B can be found in Table 1. The first model included SES and race as control variables and was not significant. Age and sex were not included as controls as they were accounted for in the creation of the FRS30B scores. As hypothesized, when the cumulative risk factor was added along with the controls in model 2, the model became significant. For every one unit increase in cumulative risk, FRS30B significantly increased by 10.78% (p < 0.001) when controlling for SES and race. Also as hypothesized, Model 3 was significant when the cumulative protective score was added to the controls. For every one unit increase in the cumulative protective score, FRS30B significantly decreased by 7.48% (p < 0.01) when controlling for SES and race. When cumulative risk and cumulative protective scores were added to the same model with controls, cumulative risk remained significant (p < 0.001), but the cumulative protective score lost its significance. The model, as a whole, remained significant. Finally, an interaction term for cumulative risk score x cumulative protective score was entered into the model with controls, cumulative risk, and the cumulative score. As hypothesized, the model remained significant, as did cumulative risk (p < 0.01). The interaction term was also significant (p < 0.05) indicating that the cumulative protective score was moderating the effect of cumulative risk on FRS30B. The decomposition of the interaction into simple slopes is presented in figure 2. Standardized cumulative risk was associated with higher FRS30B when cumulative protective scores were low (B = 13.93, SE = 2.88, p < 0.001) and at their mean (B = 7.92, SE = 2.35, p = 0.001) but not when cumulative protective scores were high (B = 1.91, SE 3.59, p = 0.60).
Table 10. Potential risk and protective factors by category, percentage of family child care providers who have each risk and protective factor and Pearson correlations for each factor with the Framingham 30 Year Risk Scores for BMI

<table>
<thead>
<tr>
<th>Factor Type</th>
<th>n</th>
<th>Yes (%)</th>
<th>FRS30B</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Health Behaviors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not physically active in last month</td>
<td>Risk</td>
<td>67</td>
<td>34.3</td>
<td>0.23</td>
</tr>
<tr>
<td>Over 9 hours a day of sedentary activity</td>
<td>Risk</td>
<td>67</td>
<td>32.8</td>
<td>0.10</td>
</tr>
<tr>
<td>Unhealthy eating(^b)</td>
<td>Risk</td>
<td>66</td>
<td>64.2</td>
<td>0.23</td>
</tr>
<tr>
<td>Less than seven hours of sleep per night</td>
<td>Risk</td>
<td>67</td>
<td>43.3</td>
<td>0.14</td>
</tr>
<tr>
<td>Not seeing a doctor due to cost</td>
<td>Risk</td>
<td>67</td>
<td>19.4</td>
<td>0.22</td>
</tr>
<tr>
<td><strong>Other Health Factors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family History of Heart Attack</td>
<td>Risk</td>
<td>65</td>
<td>16.9</td>
<td>0.18</td>
</tr>
<tr>
<td>Asthma</td>
<td>Risk</td>
<td>65</td>
<td>27.7</td>
<td>-0.11</td>
</tr>
<tr>
<td>Arthritis</td>
<td>Risk</td>
<td>67</td>
<td>23.9</td>
<td>0.42</td>
</tr>
<tr>
<td>Low food security</td>
<td>Risk</td>
<td>67</td>
<td>23.9</td>
<td>0.12</td>
</tr>
<tr>
<td>Lower SES as a child</td>
<td>Risk</td>
<td>67</td>
<td>22.4</td>
<td>0.20</td>
</tr>
<tr>
<td><strong>Psychological Factors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low stress</td>
<td>Protective</td>
<td>67</td>
<td>22.4</td>
<td>-0.29</td>
</tr>
<tr>
<td>Depression diagnosis</td>
<td>Risk</td>
<td>65</td>
<td>23.1</td>
<td>0.30</td>
</tr>
<tr>
<td>Perceive self as having resilience</td>
<td>Protective</td>
<td>67</td>
<td>40.3</td>
<td>0.06</td>
</tr>
<tr>
<td>At least one source of strong support</td>
<td>Protective</td>
<td>67</td>
<td>74.6</td>
<td>-0.16</td>
</tr>
<tr>
<td>Very satisfied with life</td>
<td>Protective</td>
<td>65</td>
<td>44.6</td>
<td>-0.24</td>
</tr>
<tr>
<td><strong>Factors Related to Child Care Business</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have children on child care assistance</td>
<td>Risk</td>
<td>67</td>
<td>65.7</td>
<td>-0.14</td>
</tr>
<tr>
<td>Consideration of exiting child care field</td>
<td>Risk</td>
<td>65</td>
<td>27.7</td>
<td>0.03</td>
</tr>
<tr>
<td>Vacancies in enrollment</td>
<td>Risk</td>
<td>67</td>
<td>29.9</td>
<td>0.04</td>
</tr>
<tr>
<td>Work over 55 hours per week</td>
<td>Risk</td>
<td>67</td>
<td>29.9</td>
<td>-0.01</td>
</tr>
<tr>
<td>Have at least one child care co-provider</td>
<td>Protective</td>
<td>67</td>
<td>82.1</td>
<td>0.04</td>
</tr>
<tr>
<td>Would choose a child care career again</td>
<td>Protective</td>
<td>67</td>
<td>62.7</td>
<td>-0.23</td>
</tr>
</tbody>
</table>

*Note.* FRS30B = Framingham Risk Score - 30 Years - Body Mass Index; COPD = Chronic Obstructive Pulmonary Disease; SES = Socioeconomic Status.
\(^b\)Unhealthy eating is a composite score. Each of the following scored as one point: having one or more sugar-sweetened beverages, less than one fruits per day, less than one vegetable per day. Then this 0 to 3 score was dichotomized into 0 or 1 or more of these three factors to create unhealthy eating.
Table 11. Multiple regression analyses for cumulative risk and protective scores predicting 30-Year cardiovascular risk using the Framingham risk score

<table>
<thead>
<tr>
<th></th>
<th>Control Variables</th>
<th>Cumulative Risk Score</th>
<th>Cumulative Protective Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE B</td>
<td>β</td>
</tr>
<tr>
<td>Intercept</td>
<td>22.74***</td>
<td>5.07</td>
<td></td>
</tr>
<tr>
<td>SES^a</td>
<td>-2.00</td>
<td>1.73</td>
<td>-0.14</td>
</tr>
<tr>
<td>Race^b</td>
<td>5.83</td>
<td>5.87</td>
<td>0.12</td>
</tr>
<tr>
<td>Cumulative Risk Score^c</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cumulative Protective Score^d</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cumulative Risk x Protective</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.03</td>
<td></td>
<td>0.29</td>
</tr>
<tr>
<td>$F$ for change in $R^2$</td>
<td>1.05</td>
<td></td>
<td>23.17***</td>
</tr>
</tbody>
</table>

Note. FRS30B = Framingham Risk Score - 30 Years - Body Mass Index.

^aSES is the sum of income standardized and education standardized.

^bDichotomous variable for race.  1=White 0=African-American/Black, Hispanic/Latino, Other.

^cThe cumulative risk score is standardized after summing not physically active, unhealthy eating, not seeing a doctor due to cost, arthritis, and depression diagnosis.

^dThe cumulative protective score is standardized after summing very satisfied with life, would choose child care as again, and low stress.

*p < 0.05, **p < 0.01, ***p < 0.001.
Table 11. (cont.)

<table>
<thead>
<tr>
<th>Framingham Risk Score - 30 Years - BMI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cumulative Risk and Protective Scores</strong></td>
</tr>
<tr>
<td>( B )</td>
</tr>
<tr>
<td>Intercept</td>
</tr>
<tr>
<td>SES( ^a )</td>
</tr>
<tr>
<td>Race( ^b )</td>
</tr>
<tr>
<td>Cumulative Risk Score( ^c )</td>
</tr>
<tr>
<td>Cumulative Protective Score( ^d )</td>
</tr>
<tr>
<td>Cumulative Risk x Protective</td>
</tr>
<tr>
<td>( R^2 )</td>
</tr>
<tr>
<td>( F ) for change in ( R^2 )</td>
</tr>
</tbody>
</table>

**Figure 2.** Increasing standardized cumulative risk scores moderated by standardized cumulative protective scores on the 30-Year Framingham Risk Score-body mass index (BMI).
For a subset of providers that completed the 24-hour dietary recall, ASA24, the Healthy Eating Index (HEI) scores were calculated. HEI scores can range from 0 to 100, with the higher scores indicating healthier eating. The total score and components are displayed in Table 12. FCCPs had an average score of 45.97 (n = 31). Areas were FCCPs had lower healthy eating scores, represented by areas where FCCPs received only half the points or less, included: total fruit, whole fruit, greens and beans, whole grains, seafood and plant proteins, fatty acids, and sodium. Areas where FCCPs had higher healthy eating scores, represented by areas where FCCPs received over half the points for a healthy eating category, included: total vegetables, dairy, total protein foods, refined grains, and empty calories.

| Table 12. Descriptives of the Healthy Eating Index scores for a subsample of FCCPs (N = 31) |
|-----------------------------------------------|-------|-------|-------|----------------|
|                                             |  M    | SD    | Min   | Max   | Percentage of Max Points* |
| Total fruit                                 | 2.24  | 2.02  | 0     | 5     | 44.78%               |
| Whole fruit                                 | 2.49  | 2.37  | 0     | 5     | 49.77%               |
| Total vegetables                            | 3.49  | 1.58  | 0     | 5     | 69.75%               |
| Greens and beans                            | 1.19  | 2.00  | 0     | 5     | 23.76%               |
| Whole grains                                | 2.08  | 3.28  | 0     | 10    | 20.77%               |
| Dairy                                        | 6.22  | 3.08  | 0     | 10    | 62.25%               |
| Total protein foods                         | 3.90  | 1.41  | 0     | 5     | 78.06%               |
| Seafood and plant proteins                  | 1.65  | 2.15  | 0     | 5     | 33.02%               |
| Fatty acids                                 | 2.69  | 2.65  | 0     | 10    | 26.86%               |
| Refined grains                              | 6.30  | 4.14  | 0     | 10    | 63.04%               |
| Sodium                                      | 2.90  | 3.27  | 0     | 10    | 29.01%               |
| Empty Calories                              | 10.83 | 6.95  | 0     | 20    | 54.13%               |
| HEI total score                             | 45.97 | 18.42 | 7.75  | 78.81 |

Note. HEI = Healthy Eating Index.

*aPercentages where less than half of the healthy eating index points were scored across FCCPs on average are bolded.

When looking at self-report items from the shorter fruits and vegetables module from the CDC, total vegetables consumed per day (M 1.71, SD 1.00) had a significant medium correlation with total healthy eating index score (r = 0.41, p < 0.05). Greens and beans (M 0.75, SD 0.56), a set of questions that also makes up total vegetables per day in the CDC module, also had a significant, medium correlation (r = 0.43, p < 0.05). Total fruit per day (M 0.85, SD 0.45) from the CDC module had a medium, non-significant correlation with the total HEI (r = 0.34, p < 0.07). Taken together as fruits and vegetables per day (M 2.55, SD 1.31) from the CDC module, there was a significant, medium correlation (r = 0.43, p < 0.05) with the total HEI.

The FCCPs in the subsample with accelerometry were sedentary on average 7.03 hours per day (SD 1.17) during this sample of weekday activity. They participated in an average of 5.60 hours (SD 1.49) of light activity, 0.24 hours (SD 0.26) of moderate activity, and 0 minutes of vigorous activity. During this sampling of weekday activity, they burned an average of 379.20 kcals/day (SD 170.59) during this activity. According to self-reported physical activity, 25.4% of providers were classified as highly
active, 15.9% were classified as active, 30.2% as insufficiently active, and 28.6% as inactive. There were 34 out of 67 FCCPs that participated in an activity with a met classification as moderate, and averaged 125.07 minutes per week (SD 111.05). Twenty-two providers participated in an activity classified as vigorous each week for an average of 161.75 minutes (SD 113.23). About one-third of FCCPs did some type of strength training two times per week (34.5%). The average self-reported sedentary time for providers was 8.00 hours per day (SD 4.36). As a bit more detail about self-reported sedentary time per day, FCCPs reported average hours for sitting at a desk (M = 0.91, SD 1.40), with friends, family or children (M = 3.26, SD 2.84), while traveling (M = 0.72, SD 0.64), while reading (M = 0.97, SD = 1.10), while watching TV or playing cards (M = 1.93, SD = 1.61), and sitting doing something else (M = 0.21, SD 0.77).

The percentages of providers falling into each stage of change for fruits and vegetables and physical activity are in Table 13. Contrary to our hypothesis, for fruits and vegetables, providers were most often in the preparation stage (47.8%). While for physical activity, providers were most often in the contemplation (35.8%) or maintenance (34.3%) stages, which was further along than hypothesized. Variables of interest related to stages of change for fruits and vegetables and physical activity are portrayed in Table 14. Only income had a small, negative correlation with fruits and vegetables stages of change. For stages of change for physical activity, fitting with our hypothesis, overall perceived diet quality had a small, significant correlation (p < 0.05), perceived general health had a medium, significant correlation (p < 0.01), and strong support had a small, significant correlation (p < 0.05). FCCPs that thought they had a greater influence on children in their care regarding physical activity were significantly correlated with a further along stage of change for physical activity (r = 0.36, p < 0.01), which aligned with our hypothesis. Childhood SES, education level, low food security, stress, and provider influence over eating habits and food preferences were not associated with stages of change for fruits and vegetables nor physical activity, which did not align with our hypothesis.

Table 13. Descriptive Statistics for stages of change for fruits and vegetables as well as physical activity

<table>
<thead>
<tr>
<th>Stages of Change</th>
<th>Fruits and Vegetables</th>
<th>Physical Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Precontemplation</td>
<td>14</td>
<td>20.9</td>
</tr>
<tr>
<td>Contemplation</td>
<td>3</td>
<td>4.5</td>
</tr>
<tr>
<td>Preparation</td>
<td>32</td>
<td>47.8</td>
</tr>
<tr>
<td>Action</td>
<td>4</td>
<td>6.0</td>
</tr>
<tr>
<td>Maintenance</td>
<td>10</td>
<td>14.9</td>
</tr>
</tbody>
</table>
Table 14. Correlations with stages of change for fruits and vegetables as well as physical activity

<table>
<thead>
<tr>
<th>Stages of Change</th>
<th>Fruits and Vegetables</th>
<th>Physical Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Perceived Diet Quality</td>
<td>0.20</td>
<td>0.27*</td>
</tr>
<tr>
<td>Perceived General Health</td>
<td>0.11</td>
<td>0.42**</td>
</tr>
<tr>
<td>Childhood SES</td>
<td>0.21</td>
<td>-0.16</td>
</tr>
<tr>
<td>Education</td>
<td>-0.05</td>
<td>0.16</td>
</tr>
<tr>
<td>Income</td>
<td>-0.26</td>
<td>0.04</td>
</tr>
<tr>
<td>Low Food Security</td>
<td>0.69</td>
<td>0.83</td>
</tr>
<tr>
<td>Strong Support</td>
<td>0.12</td>
<td>0.28*</td>
</tr>
<tr>
<td>Stress</td>
<td>-0.13</td>
<td>-0.16</td>
</tr>
</tbody>
</table>

Influence as FCCP on children in care regarding:
- Food preferences | 0.11 | 0.12 |
- Eating habits | 0.00 | 0.19 |
- Physical activity | 0.15 | 0.36** |

*Note. SES= Socioeconomic Status, FCCP = Family Child Care Provider.

For health beliefs, the scale for each question included strongly disagree (1), somewhat disagree (2), somewhat agree (3), and strongly agree (4). On average providers tended to agree with the statement “choosing a healthy diet is just a matter of knowing what foods are good and what food are bad” (M = 3.24, SD = 0.82). FCCPs tended to fall between somewhat agreeing and somewhat disagreeing with the statement “eating a variety of food each day probably gives you all the vitamins and minerals you need” (M = 2.85, SD 0.93). On average, providers disagreed with the statement that “some people are born to be fat and some thin; there is not much you can do to change this” (M 1.72, SD 0.79). For the statement “starchy foods, like bread, potatoes, and rice, make people fat,” providers were between somewhat agree and somewhat disagree (M 2.67, SD 0.93), which was also true of the statement “there are so many recommendations about healthy ways to eat, it’s hard to know what to believe” (M 2.81, SD 0.82). FCCPs agreed on average with the statement “what you eat can make a big difference in your chance of getting a disease like heart disease or cancer” (M 3.67, SD 0.53). Finally, providers tended to disagree with the statement “the things I eat are healthy, so there is no reason for me to make changes” (M = 1.88, SD 0.79).

**Discussion**

This chapter examines FCCP health in more detail and focuses specifically on cardiovascular risk as a way to do so. As in the previous chapter, it is important to interpreting the results to understand the population of FCCPs in this sample. African-American or black and Hispanic or Latinos were
underrepresented compared to the “likely to be FCCPs” in the ACS survey sample. Lower educated and lower income FCCPs were also underrepresented. Married FCCPs may have been overrepresented. One-quarter of FCCPs reported having a co-provider in this sample. A frequency which was fairly similar to what was reported in the Illinois Salary and Staffing Survey 2013 that indicated that 30.5% of FCCPs had paid assistants and another 29.0% had unpaid assistants. FCCPs in this sample with insurance were overrepresented. Medicaid or Medicare was reported by 29.9% as their source of insurance. These rates are twice that of the Illinois Salary and Staffing Survey (2013). Two providers mentioned while filling out the survey that it was only recently they were able to obtain insurance due to the Affordable Care Act after years of being uninsured. Overall, this sample of FCCPs was reasonably diverse, but likely represented FCCPs with greater resources and supports. If so, we would predict these providers would be in better health than FCCPs with fewer resources and supports.

While by some criteria this FCCP sample appears better resourced, 43.3% of FCCPs in this sample still reported using some type of financial assistance. This is about twice the percentage documented in the Illinois Salary and Staffing Survey. In that survey, 22.8% reported receiving one or more types of financial assistance (Bruckner et al., 2013). The majority of providers also earned over $1,000 per month from child care, which means that this was likely an important source of income for them and their families. Only about 16.4% were also working another job besides child care. Almost all of the FCCPs participated in CACFP (95.5%), which is higher than likely exists in the general FCCP population. The Salary and Staffing Survey from 2013, although also not a representative sample, supports this idea with 73.2% reporting being a part of the CACFP (Bruckner et al., 2013). Interestingly, over half of the FCCPs also said they had previously worked as a center provider. Many providers cared for their own children or relative’s children. Recall that in the literature discussed earlier, caring for one’s own children can be a benefit leading to greater satisfaction, but can also be a source of stress (Todd & Deery-Schmitt, 1996).

Variables used to create FRS30 scores. Taking a closer look at the variables that went into the creation of the FRS30B and FRS30L, high rates of diabetes are present. It may be possible that providers that had diabetes were more comfortable with participating in the study, which included a finger stick. This differs from our original hypothesis about who would participate in the study. Our original hypothesis was that those that are healthier would be more likely to participate. Without additional studies in this area, it is difficult to know if this percentage of diabetes is going to representative for FCCPs or if it is higher or lower than normal rates in this population. Systolic blood pressure was on average in the normal range (< 120 mmHg) as was total cholesterol (< 200 mg/dL). HDL was on average at a healthy level for both males and females at 56.8 mg/dL. However, above 60 would be even better as it is considered to have heart protective effects above those levels (Frieden, 2012). BMI was on average in the
obese category at 30.6 kg/m², which is concerning. The average BMI of these providers was a bit higher than in the anonymous survey. One of two possibilities could explain this difference. First, the anonymous survey was self-report, which could mean that on average FCCPs reported lower weights leading to lower BMIs. Second, it could also be possible that for some reason this sample just happened to end up with individuals with higher BMIs. Measured and self-reported BMIs in this sample were highly correlated at an $R^2$ of 94%. However, these providers knew that we would also be measuring their heights and weights, which could have led them to be more truthful in their answers than in the anonymous survey. Fortunately, we were able to obtain self-report BMI in both samples, and there were no statistical differences. Self-report BMI was 29.36 kg/m² in the in-person study and 28.16 kg/m² in the anonymous study.

**FRS30B and FRS30L.** The results from the FRS30B and FRS30L are rather alarming. FCCP BRS30B risk was on average 21.85% and 27.09% for FRS30L, which is difficult to interpret. However, as each provider’s FRS30 score was calculated, a normal and optimal score was obtained based on his or her age and sex, allowing for a comparison. As FCCPs age, as is true for everyone, their risk increases because age is an independent risk factor for CVDs. Therefore, the optimal scores are what would be expected to be a best case scenario for people of a certain age and gender. It is important to note that it is possible to be less than the optimal value. Therefore for FCCP risk minus normal risk and FCCP risk minus optimal risk, values could be negative, positive or zero. FCCP risk minus normal risk for the FRS30B was 10.58%, whereas it was only 2.71% for FRS30L. However, the standard deviation for the FRS30L is six times the mean and the range includes a wider range of negative values. So, although FCCPs may look closer to normal for the FRS30L, there also seems to be a wide array of variation for these providers. In addition, even with on average only being 2.71% higher, 40.30% of FCCPs were classified as over the normal risk threshold for the FRS30L. For the FRS30B, 73.13% were classified as over normal risk, which is quite a startling number. It appears that FCCPs may, unfortunately, be at a higher risk for cardiovascular events in the next 30 years than individuals of the same sex and age. For the FRS30B providers were on average 13.57% higher than optimal risk and 86.57% fell above the optimal risk threshold for their age and sex. For the FRS30L, providers were on average 10.99% higher than optimal risk and 80.66% fell above the threshold for optimal risk. These results extend recent findings (Whitaker et al., 2013) that child care providers, such as FCCPs, may be less healthy than their peers.

**Other CV factors related to FRS30 scores.** As this was the first time the FRS30 has been used with child care providers, other variables commonly associated with CVDs, obesity, and/or diabetes were also included to help provide face validity to the FRS30 risk scores. Diabetes measures included HbA1c and random glucose, both of which correlated with FRS30B. HbA1c also correlated with FRS30L. Percent body fat and basal metabolic rate also correlated with FRS30B. FRS30L correlated with basal
metabolic rate, but not percentage body fat. As it also did not correlate with BMI, it seems that FRS30L is tapping into risk that is not associated with body composition. Total cholesterol to HDL ratio was significantly related to both FRS30B and FRS30L. This was not a surprise for the FRS30L, as total cholesterol and HDL went into the calculation for this score. However, it was helpful in interpreting the FRS30B, which was not associated with total cholesterol or HDL on its own, but was associated as a ratio of total cholesterol to HDL. This may mean that the FRS30B is able to tap into some of the risks associated with cholesterol levels. Both FRS scores were correlated with diastolic blood pressure, which further supports their accuracy. Although resting heart rate can be related to CVDs and mortality, it varies depending on the sample. In this study, it was not related to either risk score. Finally, better self-reported general health is negatively associated with both risk scores fairly equivocally. This is important because the general health question has been shown to be related to all-cause mortality (Jylha, 2009). As a single, easy to ask question, the general health questions could be easily added to many existing types of data collections for child care providers.

**Selection of FRS30B over FRS30L.** In examining the descriptives for these two scores, FRS30B and FRS30L, as well as correlations with other cardiovascular related factors, we decided to use the FRS30B for further analyses. This decision was made for several reasons. For one, it was statistically important to have a high amount of variance so as to determine possible risk and protective factors. The FRS30B had 1.23 times the variance than the FRS30L. The FRS30B also correlated with seven out of eight cardiovascular-related factors (HbA1c, random glucose, % body fat, basal metabolic rate, total cholesterol:HDL ratio, diastolic blood pressure, and self-reported general health) while the FRS30L correlated with five (the same factors except random glucose and % body fat). The FRS30B was calculated using BMI, so its correlation with the total cholesterol to HDL ratio was important in selection of a risk score that would also capture, at least in part, the cardiovascular risk due to lipids. The FRS30L, on the other hand, failed to correlated with either % body fat or BMI. Finally, taken with the results from study one showing that FCCPs appear to have higher rates of overweight and obesity, CV risk associated with BMI may be especially important to investigate in this population. Using the FRS30B allows us to further investigate what factors may be related to these increased rates.

**Benefits to using the FRS30B.** There are several reasons why using the FRS30B may be especially beneficial. For one, the elements that make up this score are easy to measure. Although we were able to capture some more detailed information about provider health in this study using point of care technologies, these results demonstrate that there may be ways to collect this data in a much less intensive fashion using the FRS30B risk score. In order to calculate the FRS30B, the following variables are all that is needed: age, sex, BMI, systolic blood pressure and whether the person reports having diabetes, currently smoking, or taking high blood pressure medications. Height and weight measures to
calculate BMI and blood pressure readings could easily be measured as part of an intervention or study in less than 10 minutes.

BMI can also be gathered through self-report. In this study, there was an approximate difference of 6% between self-report and measured BMI. The self-report average for BMI was not different between the anonymous and in-person study, which suggests that these may not have been biased as much as we predicted when knowing that weights and heights would be taken during the study. In addition, only 10% of providers failed to provide either height or weight across both samples, which may suggest that providers are more willing than may have been predicted to share such information for studies. Although actual measures would be more accurate, an approximated FRS30B could be calculated using self-reported BMI. If self-report BMI was used, then all of the factors that go into the FRS30B risk calculator could be easily collected through seven easy questions that most providers could answer plus one that must be measured, systolic blood pressure. Most people get systolic and diastolic blood pressure confused so it is unlikely that this number could be gathered through self-report. However, blood pressure could be easily measured during an intervention or study. As part of helping providers learn to monitor their own health, providers could also be asked during an intervention or training to go to a grocery store and measure their blood pressure since most pharmacies now have these machines.

The second reason that the FRS30B may be beneficial to use is that it generates a percent risk of having a cardiovascular event, which may be a more concrete and valuable tool in promoting health behavior change. Clearly BMI is an easy to calculate measure that could be particularly helpful in this population. Still, BMI is not a perfect measure of health and can be difficult to interpret without additional health information, especially when recommending health changes. The FRS30B may offer advantages to FCCPs in being able to more easily interpret what their health information really means. For example, the average FCCP in this study was female, around 45 years of age, had a systolic blood pressure of 118 and a BMI of 30.6 kg/m². This average provider has a 19% risk of a CV event in the next 30 years compared to the normal risk for her age and sex of 16% and optimal risk of 13%. Now if we add in treated hypertension into the calculator, since a quarter of providers in this study reported having treated hypertension, the risk increases to 31%. Seeing the risk of having a life-changing event rather than a list of risk factors may make it easier for providers to understand their risk and transition into conversations about health behavior change. This may be especially important for risk factors as crucial to address as smoking. For an average provider on hypertension medications who also smokes, the risk increases from 31% to 49% of having a cardiovascular event in the next 30 years. It may be easier to understand the impact of smoking for a FCCP when seeing this 18% increase than when talking in general about the risks of smoking. These are examples of how the FRS30B could be used as an influential tool for FCCPs, which also falls in line with the literature regarding the need for personalizing
cardiovascular risk for women. A study on cardiovascular risk perceptions for women following a screening event produced data indicating that women substantially underestimate their perceived risk when compared to their measured risk (Kling et al., 2013). Overall, the FRS30B could be an easier and potentially more effective tool for talking about cardiovascular risk with FCCPs.

**Risk and Protective Factors.** As FCCP risk is high, it is important to examine factors related to risk as well as those that may be protective that are related to the process of resilience. Very few studies have previously looked at the idea cardiovascular resilience (Chen & Miller, 2012). Much of the literature focuses on risk. However, it is important to not only reduce risk but to also support and increase protective factors that can lead toward the process of resilience. Due to a smaller sample size, we cannot rule out risk or protective factors that were not significant as we are more likely to fall into a type II error than a type I error. For example, lower SES as a child has a small correlation a p = 0.10. While in this study, lower childhood SES was not significant related with controls to FRS30B that does not necessarily mean that it does not play a role in FCCP cardiovascular risk. It is likely, however, that those factors that rose to significance are actually risk or protective factors for FCCP cardiovascular health, as a type I error is less likely.

**Cumulative Risk Score.** The factors that were significant risks included not being physically active in the last month, unhealthy eating, not seeing a doctor due to cost, arthritis, and depression. All of these factors have been previously documented in the literature and span a variety of areas of risk including health behaviors, access to care, inflammatory diseases, and psychological disease (Lang, Lepage, Schieber, Lamy, & Kelly-Irving, 2007). The literature and the U.S. government have long been documenting that not being physically active can be a risk for CVDs (U.S. Department of Health and Human Services, 1996). The quality of a diet is also important to weight status and multiple cardiovascular health factors (Nicklas, O’Neil, & Fulgoni, 2012). Not seeing a doctor due to cost likely stems from the lack of health care access seen in the first study chapter. Providers reported not seeing a doctor due to cost or for another reason more often than the matched sample. They also reported lower numbers of ever having a cholesterol check. These issues of access are important in thinking about FCCP health and cardiovascular risk. Without proper preventative care, early risk factors for CVDs may go unnoticed, and steps to alleviate these risks may not be taken. Arthritis has been shown to possibly contribute to cardiovascular risk, especially disruption or rupture of unstable plaques, due to the long-term inflammatory state seen in rheumatoid arthritis (Chung et al., 2005). Similarly, depression has also been shown to be related to increased inflammatory states and weight status implicating it as a cardiovascular risk factor (Miller, Stetler, Carney, Freedland, & Banks, 2002). As these risks span a variety of areas, it is not surprising that they create a strong cumulative risk factor. A one-unit change in standardized cumulative risk is associated with a 10.78% increase in the FRS30B, a considerable increase in risk.
**Cumulative Protective Score.** It is important to note the in the resilience literature there is a distinction made between protective and promotive factors, for the purpose of this paper we will discuss protective factors as the process of resilience. Protective factors that rose to significance in relation to the FRS30B included being very satisfied with life, having low stress, and strongly agreeing to choose a child care career again. What is interesting about child care related factors is that strongly agreeing to choose a child care career again was negatively associated with FRS30B whereas consideration of exiting the child care field in the last year, a variable often measured in relation to job satisfaction, was not related. Positive factors related to well-being, such as satisfaction with life, have been shown in many studies to be related to cardiovascular health (Boehm & Kubzansky, 2012). However as is true in this study, risks may outweigh protective factors. We agree with Boehm and Kubzansky that this is not a reason to stop investigating protective factors. In this study, every one-unit increase in the cumulative protective score, with controls are accounted for in the model, leads to a 7.48% decrease in FRS30B. Although not as strong in the model as risk, the cumulative protective score did moderate the effect of the cumulative risk score on 30-year risk for a cardiovascular event. Those with lower protective and higher risk scores had significantly higher FRS30B scores. Those with average cumulative protective scores had almost a two-fold reduction on the relationship between increasing cumulative risk and higher FRS30B scores. Finally, those with higher cumulative protective scores had lower FRS30B scores regardless of increasing cumulative risk, signified by the simple slope for higher cumulative protective scores not being significant.

**Study results in terms of the theoretical model.** These cumulative risk and protective score results fit well in our theoretical model, the modified double ABC-X model for cardiovascular risk and resilience presented at the beginning of this study. On their own, increasing cumulative risk factors lead to greater cardiovascular disease vulnerability. Without resources and perception/appraisal that normally lead to coping, FCCPs end up falling into the maladaptation end of the coping-adaptation continuum. However, in the presence of mean or higher levels of cumulative protective scores to moderate these cumulative risk factors, perception and appraisal, as well as the inclusion of needed resources, lead to coping thereby reducing cardiovascular risk. This is the process towards cardiovascular resilience whereby working to alleviate stressors or risks and supporting resilience leads to bonadaptation.

The protective factors that make up the cumulative protective score and ultimately the process towards CV resilience include aspects that probably fall under perception and appraisal as well as resources. Providers that are very satisfied with life are likely to perceive and appraise situations differently perhaps allowing them to make needed changes to cope. In addition having low stress could be considered a resource. FCC is challenging and stressful. For those FCCPs that have low stress, they are finding a way to use their strengths and supports in a way that is different from FCCPs with high stress.
Finally, the desire to choose a child care career again shows great job satisfaction, but also shows great personal satisfaction. It likely means that providers feel competent at what they are doing. Satisfaction and competence could certainly serve as a resource for these providers. Would choose a child care career again could also be a form of meaning-making which could affect the way these FCCPs undergo perception and appraisal of stressors. Further research will need to be conducted to tease these roles further apart.

These protective factors are able to significantly impact stressors and risks related to physical health (unhealthy eating, physical inactivity, and the chronic disease arthritis), mental health (depression), and demographic risks (age, sex, SES, and lack of access to healthcare). These are some of the most common domains discussed in the cardiovascular literature. Further research should be conducted to evaluate if protective factors leading to the process of resilience can moderate risk for other types of child care providers, longitudinal samples, different occupations, and more generalized populations. The modified double ABC-X model for cardiovascular risk and resilience could be important to FCCPs and child care, but it may also have greater applicability.

This study is one of a few studies in the cardiovascular literature to look at resilience as a way to moderate typical cardiovascular risk factors. It furthers the work done by Chen and Miller regarding “shift-and-persist” strategies and thinking about physical health resilience (2012). This is important as even within the literature using “resilience,” a lack of resilience (technically risk) is often evaluated rather than looking at resilience as a separate positive contribution (independent of risk). As an example, one study evaluated a lack of occupational and personal resilience in relation to job strain and how job strain could be related to CVDs (Ferris, Sinclair, & Kline, 2005). While a perfectly valid way to look at cardiovascular risk, it is puzzling as to why after defining resilience as a positive term the analyses were run to investigate a lack of resilience rather than resilience as a protective factor. In this way, the use of resilience is effectively being used as a risk framework rather than a resilience framework. The implications are still relevant to thinking about promoting cardiovascular resilience. They noted that early identification of factors that could impact personal or organizational resilience are important considerations in the primarily male, blue collar population they were examining (Ferris et al., 2005). These findings are also applicable and important for FCCPs, but testing these factors as resilience factors is important to better understanding resilience as a construct in the CV literature.

A lack of an easy to use theoretical model has likely made it difficult for the cardiovascular literature to conceptualize and evaluate resilience for CVDs. Perhaps future work can continue to refine and test the model adapted in this study. As the majority of CV literature pertains to risks only, as is true of most medical literature, the notion that resilience could moderate risk and independently be related to decreasing CV risk is relevant to the field of CV health. In addition, positive psychological well-being
factors could also be classified as resilience factors so these findings also lend support to the hypothesis that higher psychological well-being may be related to better CV health.

**Healthy Eating Index.** Further information about FCCP dietary patterns was garnered through the HEI and compared to the shorter CDC module for fruits and vegetables. The HEI is considered a valid and reliable way to measure diet quality (Guenther et al., 2014). For the subsample of FCCPs, the HEI showed that areas most in need of improvement were total fruit, whole fruit, greens and bean, whole grains, seafood and plant proteins, fatty acids, and sodium consumption. The categories where FCCPs were on average meeting recommendations included total vegetables, dairy, total protein foods, refined grains, and not consuming empty calories. On average, FCCPs scored 45.97 points out a 100. As a comparison, when the testing of exemplary diets from the NHANES using the HEI, scores ranged from 87.8 to 100.0; women in this study scored an average total score of 52.7 (Guenther et al., 2014). FCCPs in our study were on average 6.73 points lower than women in the NHANES and considerably lower than what would be considered an exemplary diet. When the comparing the CDC questions on diet to the HEI, total vegetables, greens and beans, and total fruits and vegetables per day all had significant, medium sized correlations with the HEI. These results add evidence that although not a perfect measure, the six question fruits and vegetable module by the CDC could be a good indicator of diet quality for FCCPs.

**Accelerometry.** The results from accelerometry are not directly comparable to our self-reported measures. As such no comparative statistics were run. Accelerometry would have needed at least four full days with at least one weekend day and at least 10 hours of wear time each day in order to be considered representative of overall physical activity levels. Therefore, only descriptives are provided in this study. It was notable that sedentary time during waking hours using the accelerometry (7.03 hours) and self-report (8.00 hours) were similar to someone working at a 9am-5pm desk job. Child care is hard work and is mentally and physically taxing, but it appears that it may still lead to a large number of hours spent being sedentary. Although there is often a perception that children keep providers moving and active during the day, providers reported spending over 3 hours a day sitting with children. They also reported about 1 hour reading and almost 2 hours watching TV or doing a seated activity such as playing cards, which could also be occurring with children or during their naptime. These results could also be due to FCCPs feeling tired after caring for children all day. Similar to these results, weekday wear time also shows on average zero minutes of vigorous activity and only an average of 24 minutes per day of moderate level activity. The majority of activity other than sedentary time is in light activity for an average of 5.60 hours per day. These results tell a more sedentary picture than is typically thought of in a busy child care home and is important when considering activity levels that will help FCCPs get heart protective, aerobic activity.

On a positive note, for self-reported activity outside of child care, 34 FCCPs self-reported participating in moderate level activities for on average 125 minutes per week and 22 FCCPs reported
participating in vigorous activities for an average of 161.75 minutes per week. These outside child care activities led to 25.6% of providers being classified as highly active and another 15.9% being classified as active. These results are promising in that over 40% of FCCPs report levels that meet minimum aerobic activity recommendations. Even with self-report, 30.2% were still classified as insufficiently active, and 28.6% were classified as completely inactive. Only about one-third of FCCPs reported meeting strength training recommendations, which are important for bone health and building metabolically active skeletal muscle mass. Taken with the rest of the study, insufficiently active and inactive FCCPs are an important population to target for intervention, as not being physically active at all was found to increase risk for being overweight or obese in the first study and for 30-year cardiovascular risk in the second study.

**Stages of change.** When thinking about how to tailor interventions for FCCPs, stages of change are important to consider. Interestingly, providers reporting on physical activity were more likely to be in contemplation, where they are thinking about making a change but have not yet made a change, or maintenance, where they have already made a sustained change, although the magnitude of change was not measured. Whereas for fruits and vegetables, most providers were in the preparation stage, which means they intend to make a change very soon. The remaining FCCPs were either in precontemplation or maintenance for fruits and vegetables. It is quite possible that in our study, FCCPs that were either considering making a change or were just about to make a change were more likely to participate. However, it is also helpful to know that there are FCCPs ready to make such changes who would be prime targets for intervention. We called the study *Heart Health in Family Child Care* and did advertise it, in part, to providers that may be interested in learning more about their heart health. Most people tend to be curious about their health and under low-risk circumstances might be willing to participate. Anecdotally, several of the FCCPs that participated in our study did make changes to their diet or exercise patterns after receiving their heart health information. As these FCCPs sometimes have limited access to preventative care, most FCCPs were quite interested in receiving their health information. Adding to our discussion of the benefits of using the FRS30B, using it to calculate cardiovascular risk could become a tool for the beginning of an intervention with FCCPs so that they understand their current health status and future risk. This understanding could encourage FCCPs to be more receptive to behavioral changes in areas such as physical activity or fruits and vegetable intake that could not only be helpful for their health, but also are areas where FCCPs could also be positive role models for children.

Correlations with further along stages of change for physical activity were correlated with overall perceived diet quality, perceived general health, and strong support. The correlation with perceived diet quality could be due to providers that are more physically active (such as in the maintenance stage) also having higher quality diets. It is a bit peculiar that overall perceived diet quality did not correlate with stage of change for fruits and vegetables. However, this may be because almost half of providers in this
study were right in the middle of the scale at the preparation stage, which may indicate that our study lacked the variability in this area necessary to detect such an association. Perceived general health was related to stage of change for physical activity only. With cross-sectional data, it is not possible to say whether FCCPs that perceive their health as better are more likely to be in a higher stage of change or that FCCPs in a higher stage of change are likely to perceive themselves as having better health. It is also possible that some part of each of these statements is true.

For stages of change for fruits and vegetables, the only factor that was trending toward significance in a negative direction was income. The positive side of this result is that FCCPs with lower incomes were not less likely to be in a higher stage of change. Many FCCPs were on some sort of financial assistance and utilized CACFP for the children in their care. However, most of the FCCPs that participated had methods for ensuring they were able to access healthy foods. For example, one FCCP told us that she was always able to get healthy foods, including fruits and vegetables, even when she used the food pantry to supplement her family and her child care home’s food. Perhaps in communities with such resources, FCCPs of lower incomes will still be able to move forward in their stages of change for fruits and vegetables. This correlation also could point to the notion that FCCPs that have higher incomes may be at a lower stage of change for fruits and vegetables. The upside of this possibility is that FCCPs with higher incomes should be able to afford to change their dietary habits.

Finally, it is extremely important to note that being at a higher stage of change for physical activity was significantly associated with FCCPs feeling that they had an influence over children in their care regarding physical activity. This result brings us back to the idea that provider health and health practices could be important when thinking about health promotion for the children in their care. Future research should look further into this result, especially as it relates to provider self-efficacy for physical activity.

**Concluding thoughts.** This study provides the first evidence that in addition to higher rates of overweight and obesity, FCCPs also may have poorer cardiovascular health. In addition, this study provides important evidence that cumulative protective factors may moderate cumulative risk when it comes to 30-year cardiovascular risk. The HEI was significantly correlated at a moderate level with multiple components of the CDC’s fruits and vegetables module, which means that this module could be a useful screening tool for FCCP diet quality. FCCPs are spending approximately the same number of hours sedentary during waking hours as someone would at a desk job. It also appears that most the time spent during care, while active, may only include light activity, which does not have the cardiovascular benefits of moderate or vigorous activity. On a positive note, 40% of providers are managing to be meeting aerobic recommendations based on self-reported activity for moderate and vigorous activity. Most providers that participated in the study are close to making a choice to make a change or have made
a change in their physical activity levels and fruit and vegetable consumption, demonstrating that these could be good areas for intervention. This is especially true given that unhealthy eating and not being physically active were not only important for weight status, as indicated in the first study, but are also important for cardiovascular risk in this study.
Chapter Five: Integrative Discussion

To date, this study is the first to focus specifically on the health of FCCPs, the lowest wage earners in the already low-paid occupation of child care (Whitebook et al., 2014). As almost 1.5 millions children annually attending FCC (Laughlin, 2013), understanding the health of FCCPs is vital to understanding FCC as a health context. FCC tends to be a more affordable option for parents, often meeting the needs of lower income populations who may also face notable health disparities. FCCP health may also matter in the context of the quality of care provided for these young children (Baldwin et al., 2007). A descriptive picture of these providers and the factors that impact their health is important for FCCPs, but is also important in moving to the next step of understanding how similar factors may also affect child health.

Important findings in these studies included providing further evidence of the alarmingly high rates of overweight and obese weight status in this population. Risk factors that may be related to increasing odds of these higher weight statuses included unhealthy eating, not being physically active, and higher stress. FCCP health or health-related factors were poorer across several factors compared to the matched sample including general health, always getting emotional support, being very satisfied with life, delaying seeing a doctor due to cost or for another reason, seeing the dentist in the past year, one or more fruits per day, overweight and obese BMI, more than 7 hours of sleep, high blood pressure, ever having cholesterol checked, diabetes, asthma, and depression. Many of these factors are excellent targets for intervention as they could be modified with the right support. Surprisingly FCCPs in our sample had higher rates of insurance than our comparison sample in the BRFSS. However, this is unlikely to be true of the broader population of FCCPs as a sample of the ACS data (collected yearly by the census bureau) of likely FCCPs was estimated at 26.2%. The poor health reported by FCCPs in this sample is alarming given the higher rates of insurance when considering the health of the many FCCPs who likely lack insurance currently and/or who lacked insurance for many years. Studies have shown that being uninsured is related to increased rates of chronic disease and unmet healthcare needs (Ayanian, Weissman, Schneider, Ginsburg, & Zaslavsky, 2000). Being uninsured has also been shown to be related to lower quality of life and increased mortality (Dorn, 2008) making it a particularly important area for affecting FCCP health.

FCCPs were also likely to have on average higher than normal and higher than optimal risk for having a cardiovascular event in the next 30-years based on their age and sex. The risk for cardiovascular events was calculated using the Framingham Risk Score for the next 30-years (FRS30) using age, sex, and self-reported status for smoking, diabetes and hypertension medications. A score using total cholesterol and HDL (good cholesterol) were used to create the FRS30 lipid score (FRS30L) and BMI was used to create the FRS30 BMI score (FRS30B). The FRS30B was related to more factors that are
commonly related to CVDs, diabetes, and obesity in the literature, supporting its further use for investigating CV risk for FCCPs. The general health question was inversely related to FRS30B, meaning that better self-rated health is related to lower cardiovascular risk. This supports the use of the general health question in studies unable to collect more detailed data on provider health.

The FRS30B was then correlated with factors related to increased risk and increased resilience, protective factors. Factors that were significantly correlated with FRS30B formed the cumulative risk score. These factors included not being physically active in the last month, unhealthy eating, not seeing a doctor due to cost, arthritis, and depression diagnosis. Cumulative protective factors were selected based on significant negative correlations with FRS30B. These factors included low stress, being very satisfied with life, and would choose a child care career again. Using multiple regression, the cumulative protective scores significantly moderated the effect of cumulative risk on the thirty year risk of a cardiovascular event (FRS30B scores). This is one of the first studies to demonstrate that protective factors thought to lead to CV resilience moderate cardiovascular risk, a critical finding for the cardiovascular literature.

FCCPs stages of change, readiness for behaviorally health changes, were also assessed. Most often FCCPs were in the preparation stage for fruits and vegetables and the contemplation or maintenance stage for physical activity. Strong support was related to a higher stage of change for physical activity. Finally, providers with higher stages of change were related to feeling they had greater influence over physical activity for the children in their care.

Utilizing a modest sample, this study was the first of its kind to combine survey and point of care data to examine the CV risk and protective factors for any child care providers. As such, it provides a valuable contribution to the literature in the area of child care provider health. This study’s sampling strategies were unable to reach a representative number of African-American and Latino providers. The in-person study was more successful than the anonymous study at recruiting these providers. Future work with greater funding and resources should specifically target such providers. For example, one study found in trying to recruit harder to reach populations that using initial participants as “seeds” and incentivizing them through additional gift cards for successful completion of the study by referred individuals to be a beneficial way of adapting snowball sampling (Mammen & Sano, 2012).

It was not possible to know the temporal order of some of the relationships based on data collected in these studies. Longitudinal data on providers will be instrumental in helping to tease apart these relationships. Still, these studies make a valuable contribution to the small literature base in this area. Results could help inform which variables are most relevant to collect in a longitudinal study of provider health. Better understanding direct and self-report measures around cardiovascular health create new, meaningful ways to look at larger samples of providers in the future. For example, the FRS30B along with cumulative risk and protective factors could be valuable tools for assessing cardiovascular health.
during an intervention. Additionally, support for the accuracy of some of the shorter self-report measures such as the fruit and vegetable consumption module through correlations with the HEI could be helpful in larger scale data collections.

Results from these studies are pertinent to future intervention work with FCCPs. Two new interventions are being developed that are specific to the FCC context (Østbye et al., 2014; Trost et al., 2011). The current results can help support efforts, such as those undertaken by *The Keys to Healthy Family Child Care Homes Intervention*, which includes a provider health component. We applaud such efforts to support health for providers and children in the same intervention. In addition, we intend to use these results to further work on an Illinois pilot intervention aimed at providers called *Let’s Move Child Care Providers* and to help tailor it to the needs of FCCPs.

These are the most important implications for such interventions that emerge from these results. In the first study on overweight and obesity, we found that unhealthy eating, not being physically active and above average perceived stress for FCCPs put providers at increased odds of being overweight. Interventions for FCCPs should aim to decrease sugar-sweetened beverage consumption to no more than one per day, increase fruit and vegetable consumption to at least one per day each, and reduce perceived stress. Existing online health tracking programs from government such as the USDA or American Heart Association (AHA) could be utilized to help FCCPs during intervention periods. Such resources are free to use and can be used to track health and provide quality information even after a training or intervention is finished. Findings from what FCCPs believe about what they eat could also be helpful. For example, FCCPs reported believing there was a link between what they eat and a risk for diseases such as CVDs or cancer while FCCPs had mixed feelings over there being so many recommendations about health that they did not know what to think. Providing ideas for FCCPs about where to look for quality health information could be beneficial to boosting FCCPs’ confidence in knowing what recommendations to follow.

It is also important to note that FCCPs spent a considerable amount of time being sedentary. This not only has implications for their own health but also raises concerns regarding the amount of sedentary time for children. Many providers reported having arthritis, asthma, or depression, which could negatively affect FCCP participation in physical activity. Including strategies for being physically active with arthritis as well as allergies and asthma could be important for helping providers become active. Physical activity can have important health benefits including for those with these chronic illnesses. Helping work around or through barriers to physical activity is essential. FCCPs that had stronger support were more likely to be in a further along stage of change. In addition, those in a further stage of change for physical activity were more likely to feel that they could influence childhood physical activity. Therefore, when
considering how to increase physical activity for children, it is important to consider the provider’s physical activity as well.

An interesting finding in the second study was that lower stress contributed to protective factors that could lead to CV resilience. Further work should aim to understand differences in high and low reported stress for FCCPs such as what contributes to stress, coping strategies, support, and resources. Capturing these and other resilience processes that could be utilized in interventions could be just as critical as decreasing risks for promoting cardiovascular health for providers. For example, what is it about providers that would choose a child care career again that makes this a protective factor? It might be that these providers feel more satisfied, although in this study this variable was not related to life satisfaction, or perhaps this is a way of meaning making. FCCPs who would choose a child care career again could also feel more competent as an FCCP, which could be protective. Another area that could be interesting to follow-up on is whether perception and appraisals could be changed to increase life satisfaction for providers. An example of this might be that FCCPs could be perceived as showing great resilience to be able to work with few resources and low wages while providing quality child care. However, in our study FCCPs did not rate themselves as on the higher ends of the resilience scale. Helping FCCPs better understand places where they are showing resilience and tapping into this resilience could be a potential area for further work. Child care may afford risks to provider health, but that does not mean that it cannot also be a source of resilience.

Another important consideration for intervention, but also as an area where child care resource and referral agencies may be able to help FCCPs, is in the domain of access to care. FCCPs were much more likely to not see a doctor due to cost or for another reason than the matched sample. These results are in a sample of FCCPs with likely much higher rates of insurance. Many FCCPs may now qualify for insurance through the Affordable Care Act. Targeting partnerships with local agencies that employ enrollment specialists could be very helpful to FCCPs trying to navigate their insurance options. In the ACS sample of those likely to be FCCPS in the state of Illinois, 26.2% reported having no health insurance. This included both providers who are licensed, but also likely unlicensed FCCPs. Although millions have enrolled in the Affordable Care Act, there remain millions that qualify but have not yet signed up. A lack of awareness continues to be a barrier to accessing health insurance (Sommers, Maylone, Nguyen, Blendon, & Epstein, 2015). For those that do not qualify or their premiums are too high, encouraging FCCPs to utilize free clinics in their communities, when they are available, could be a beneficial way to promote access to preventative care and acute illness care. With the important role that access to care plays in FCCP cardiovascular health, it is important to approach this issue from multiple areas.
In the future, unlicensed FCCPs should be an area of focus. These FCCPs tend to be more difficult to reach and are likely to have poorer health. They could be a valuable way to reach low-income families. As a comparative example, we were able to collect data on two unlicensed FCCPs in the past who are not included in the current study. One was an example of an FCCP that has higher income from child care, cares for children of higher income parents and is valued for the instrumental role she plays in their lives. Her health data fared much better than the other unlicensed FCCP, who was providing what is often referred to as “kith and kin” care in the literature when care is provided only to one’s relatives. This “kith and kin” FCCP had uncontrolled diabetes, high levels of depression, and high stress. She also reported recently having had foot surgery and having difficulties with recovering. She took care of her grandchildren where there was a lack of space to play outside their mobile home and low food security for the family. During our visit, we helped encourage her to reach out to her doctor to talk about her diabetes and difficulties recovering. Such providers especially need support and increased access to resources. FCCPs and children in this unlicensed sector are even less studied and may be at even higher risk, especially unlicensed providers with lower incomes and resources.

Running a child care business can in and of itself limit FCCP access to health care. Many providers that have insurance reported that they were unable to get care due to restrictions of running their child care business. As an anecdote of such stressors, one provider who participated told us about how she lets her families know that she plans each year to take one day off between Christmas and New Years to go to the doctor to get her asthma medications renewed. When parents are unable to keep their children for the day, she sometimes has to find a qualified person to step in for an hour so she can go to her appointment. This creates added stress and preparation to make sure things continue to run smoothly. One year, despite her preparations, an incident occurred while she was at the doctor where one of the children in her care had a severe allergic reaction to nuts. This provider has had children in her care for almost two decades and has only had three health incidents that she remembers. One of these was while she was at the doctor. As an extremely conscientious provider, she now is even more worried about time away in order to go to the doctor. With her asthma, this annual appointment is critical to her health. As 27.69% of providers reported having asthma, 10.61% reported having diabetes, 23.08% reported having arthritis, and 23.08% reported having a depressive disorder, these FCCPs are especially in need routine primary care.

Creating ways to have qualified providers, perhaps such as those that have retired, be placed into a pool of substitutes that could be called to cover during an appointment could be very beneficial to helping FCCPs access needed healthcare. A checklist for substitute providers of potential issues while they are away could help prevent issues and help providers have the peace of mind to attend their appointments and permission to focus on their health during that time. Providing information for places like crisis nurseries where children could be safely cared for during a time that a provider needed to go
the doctor could also assist in increasing their access to health care. Other creative methods for helping providers access care is essential to supporting their health and ability to provide quality care.

Overall, the health portrait for FCCPs unfortunately does not appear to be one of good health and is instead one of increased risk for cardiovascular events and chronic disease. Further research on health for all types of child care providers is needed so that it can be used to help support providers in ways that allow them to provide the high-quality care desired across all child care settings. Interventions on health promotion for children are encouraged to add a component for providers. It is important to not only think about risks, but to also look for areas of protection and resilience. Although the cardiovascular risks for providers are disturbingly high, several areas for decreasing risks and for increasing resilience, which can further moderate risk reduction, have been presented. High rates of overweight and obesity have been documented for over 20 years in the literature. It is time to show FCCPs their value to us as a society and to work towards creating a new portrait of FCCPs health, one that can show FCCP’s cardiovascular resilience.
References


http://doi.org/10.1371/journal.pone.0065290


http://doi.org/10.1016/j.conctc.2016.05.001

http://doi.org/10.1111/j.1751-7176.2009.00121.x


http://doi.org/10.1097/00126097-200104000-00007


Appendix A: Institutional Review Board Approval Letters

Anonymous Survey Initial Approval

October 2, 2013

Angela Wiley
Human & Community Development
2006 Christopher Hall
904 W Nevada Ave
M/C 081

RE:  Family Child Care Provider Health
IRB Protocol Number: 14146

EXPIRATION DATE: October 1, 2016

Dear Dr. Wiley:

Thank you for submitting the completed IRB application form for your project entitled Family Child Care Provider Health. Your project was assigned Institutional Review Board (IRB) Protocol Number 14146 and reviewed. It has been determined that the research activities described in this application meet the criteria for exemption at 45CFR46.101(b)(2).

This determination of exemption only applies to the research study as submitted. Please note that additional modifications to your project need to be submitted to the IRB for review and exemption determination or approval before the modifications are initiated.

We appreciate your conscientious adherence to the requirements of human subjects research. If you have any questions about the IRB process, or if you need assistance at any time, please feel free to contact me or the IRB Office, or visit our website at http://www.irb.illinois.edu.

Sincerely,

Dustin L. Yocum, Human Subjects Research Exempt Specialist, Institutional Review Board
In-person Study Initial Approval

Office of the Vice Chancellor for Research
Institutional Review Board
528 East Green Street
Suite 203
Champaign, IL 61820

August 6, 2014

Angela Wiley
Human & Community Development
2006 Christopher Hall
904 W Nevada Ave
M/C 081

RE: Health in Family Child Care Feasibility Study
IRB Protocol Number: 14512

Dear Dr. Wiley:

This letter authorizes the use of human subjects in your project entitled Health in Family Child Care Feasibility Study. The University of Illinois at Urbana-Champaign Institutional Review Board (IRB) approved, by expedited review, the protocol as described in your IRB-1 application. The expiration date for IRB Protocol Number 14512, is 08/03/2015. The risk designation applied to your project is no more than minimal risk. Certification of approval is available upon request.

Copies of the attached date-stamped consent form(s) must be used in obtaining informed consent. If there is a need to revise or alter the consent form(s), please submit the revised form(s) for IRB review, approval, and date-stamping prior to use.

Under applicable regulations, no changes to procedures involving human subjects may be made without prior IRB review and approval. The regulations also require that you promptly notify the IRB of any problems involving human subjects, including unanticipated side effects, adverse reactions, and any injuries or complications that arise during the project.

If you have any questions about the IRB process, or if you need assistance at any time, please feel free to contact me or the IRB Office, or visit our Web site at http://www.irb.illinois.edu.

Sincerely,

[Signature]

Anita Balgopal, PhD
Director, Institutional Review Board

Attachment(s)

cc: Roger Figueroa Hautista
    Kevin Linares
    Katherine Magerko;

Telephone (217) 333-2676 • fax (217) 333-3405 • email IRB@illinois.edu
Appendix B: Recruitment Materials

Study 1: Anonymous Survey Flyer Recruitment

Help us Learn about your Health as a Family Child Care Provider and the Children in Your Care!

☑ Are you interested in health?
☑ Would you be interested in participating in a research study?

The Child Care Resilience Program at the University of Illinois at Urbana-Champaign is conducting a survey research study about the health of family child care providers and the children in their care.

You will receive a $10 Wal-Mart gift card for completing the survey.

For your convenience, you have the option of completing the survey online or can request a paper form.

For the online survey, please visit:

http://www.surveymonkey.com/???

To request a paper form or if you have questions about the study, please contact:

Child Care Connection of Peoria
(309) 686-3750 or (800) 421-4371

For further questions regarding the study, please contact Dr. Angela Wiley (awiley@illinois.edu) who is the responsible project investigator for the Child Care Resilience Program and this survey study.
**Study 1: Anonymous Survey Email Recruitment**

Dear Family Child Care Provider,

**Help us learn about your health as a family child care provider and the children in your care!**

Are you interested in health? Would you be interested in participating in a research study?

The Child Care Resilience Program at the University of Illinois at Urbana-Champaign is conducting a survey research study about the health of family child care providers and the children in their care.

For completing the survey, you will receive a **$10 Wal-Mart gift card**.

For your convenience, you have the option of completing the survey online or can request a paper form.

For the **survey**, please click here: [http://www.surveymonkey.com/???](http://www.surveymonkey.com/???)

To request a **paper form** or if you have any questions, please contact:

**Child Care Connection of Peoria**  
(309) 686-3750 or (800) 421-4371.

*For further questions regarding the study, please contact Dr. Angela Wiley ([awiley@illinois.edu](mailto:awiley@illinois.edu)) who is the responsible project investigator for the Child Care Resilience Program and this survey study.*

Thank you for your time,

The Child Care Resilience Program
**INTERESTED in Heart Health?**

As part of a study, University of Illinois researchers would like to come to you for a **FREE** health screening for you and the children in your care!

Through fun activities, the Child Care Resilience Program at the University of Illinois at Urbana-Champaign would like to measure health of Family Child Care Providers and healthy development of children in Family Child Care.

**Are you…**

1. Interested in your own health?
   a. And willing to participate in things like being screened for high cholesterol & diabetes through a finger stick and wearing a device that measures your activity?

2. Currently caring for at least one preschool aged child?
   a. And willing to pass along information about the study to parents?

3. A Family Child Care Provider?

   **If so, then we need your help!**

   **For your participation, you will receive your own HEART HEALTH REPORT & A WAL-MART GIFT CARD!**

If you are interested in participating, please contact our research team at:

childcareresearch@illinois.edu

OR

217-244-9586

For further questions regarding the study, please contact Dr. Angela Wiley (awiley@illinois.edu) who is the responsible project investigator for the Child Care Resilience Program and this study.

**Spring/Summer 2015**
Are you a Family Child Care Provider Interested in Heart Health?

As part of a study, the University of Illinois researchers would like to come to you for your very own FREE health screening!

The Heart Health in Family Child Care Study

To participate, you would choose a time to have a researcher come to you to measure your blood pressure, blood sugar, cholesterol, height, weight, and more. In addition, you would be asked to fill out some survey questions. The visit would take about 1 hour.

For participating you will receive

a heart health report

AND A WAL-MART GIFT CARD

If you are interested in participating, please contact:

childcareresearch@illinois.edu

OR

217-244-9586

For further questions regarding the study, please contact Dr. Angela Wiley (awiley@illinois.edu) who is the responsible project investigator for the Child Care Resilience Program and this study.
Appendix C: Provider Consent Forms

Study 1: Anonymous Survey Consent Form

Child Care Provider Health Survey

Dear Family Child Care Provider,

The Child Care Resilience Program at the University of Illinois invites you to take part in an anonymous research study about Family Child Care Provider Health.

WHO IS CONDUCTING THIS RESEARCH STUDY?
Dr. Angela Wiley, a professor in the Department of Human and Community Development, and her graduate students are conducting this research project.

WHAT IS THE PURPOSE OF THIS STUDY?
The purpose of this study is to better understand health and health practices of Family Child Care Providers.

WHAT WILL I EXPERIENCE AS A RESEARCH PARTICIPANT?
You will be asked a variety of questions in the online survey about your health, health care coverage, overall wellness, and child care business. The survey should take you between 40 – 50 minutes. It will include questions where you select an answer choice and questions where you are asked to enter your own response.

WHAT WILL HAPPEN TO MY SURVEY RESPONSES?
Only the researcher team will be able to see your responses. No personally identifying information will be collected. There will be some open response questions where you will be asked to write your answers in the space provided. In these responses, we ask that you do not enter any identifiable information. Your responses will be combined with the responses of all other providers who are taking part in the study. All responses will be kept on a secure computer server that only the researchers can access.

HOW WILL THIS INFORMATION BE USED?
After the completion of this study, the information will be summarized and the knowledge we gain from this research will allow us to design more detailed studies as well as offer recommendations to improve support services and inform policies related to Family Child Care. Project reports and presentations will not include any identifying information.

ARE THERE ANY RISKS INVOLVED IN PARTICIPATING IN THIS PROJECT?
Participation in this study involves minimal risks comparable to those you experience in your everyday life. There are no physical risks involved in this study. Your choice to participate or refrain from participation will not affect your status as a provider or your standing with the Child Care Connection. No one, except for the researchers, will have access to your individual responses. Your name and address will be kept at Child Care Connections and/or stored with a staff member at the University of Illinois so that they can send or hand you a gift card upon completing the study. Neither Child Care Connections nor the staff member at the university will have access to your survey and your responses will not be linked to your identifying information.

Your participation is completely voluntary, and you may end your participation at any time without consequences although the gift card will not be mailed to you until we receive your survey. You may choose to skip questions you prefer not to answer should any question cause you discomfort.

WHAT ARE THE BENEFITS INVOLVED IN PARTICIPATING IN THIS PROJECT?
While there are no direct benefits to you, many providers enjoy sharing their experiences and thinking about their work and lives. It may also feel good to that your experiences may help future family child care providers and the children in their care.
IS THERE ANY COMPENSATION FOR MY TIME?
For taking the time to fill out this survey, you will receive a $10 Wal-Mart gift card. At the completion of the survey, you will be able to use the email address provided to send your name and address to a staff member at the University of Illinois. This staff member is not part of the research team and will never see your survey. They will then mail you a gift card.

If you are completing the survey at the Child Care connection of Peoria office, you will not need to email the U of I staff and wait for your gift card. The Child Care Connection staff can give it to you when you are done.

GUIDELINES FOR PARTICIPATION:
We ask that each family child care provider take the survey only once so that we can get a clear picture of FCCP health.

CONTACT INFORMATION:
If at any time you have questions about The Family Child Care Provider Health Project, please feel free to contact Dr. Angela Wiley, at awiley@illinois.edu or (217) 265-5279.

If you have any questions about your rights as a participant in this study or any concerns or complaints, you may contact the Institutional Review Board at the University of Illinois at Urbana-Champaign by telephone at (217) 333-2670 or email at irb@illinois.edu. Identify yourself as a participant in the study. If you live outside the study area, you may call collect.

CONSENT:
By moving on to take the survey, you are agreeing to take part in a research study under the supervision of Dr. Angela Wiley at the University of Illinois at Urbana Champaign. You are also certifying that you are 18 years or older and of legal age to provide informed consent for research and that you fully understand the risks and benefits of the research. At any time during the survey, you will be able to withdraw your consent and end participation with no repercussions.

Please print or save a copy of this consent page for your records.

I have read and understood this consent letter and voluntarily agree to participate. Please click NEXT to provide consent and proceed to the survey.
Dear Family Child Care Provider,

The Child Care Resilience Program at the University of Illinois is interested in understanding health in family child care settings. You are invited to take part in the first step of our study which will help in determining what measures are best suited for assessing provider’s and children’s health. We would very much appreciate your help and the help of one or more of the children in your care.

Simple measures for children will include height, weight, and blood pressure. Your measures will include those already mentioned, but will also include: cholesterol and diabetes testing through a finger stick, a nutrition questionnaire, wearing a device that measures your activity levels, short video recordings of a few daily activities, and answering a few questions on paper and through a short interview. The majority of measures will occur at your child care setting during your hours of operation in a 2 – 4 hour period. When one of the researchers is working with you, the other will be engaging the children in your care in activities. All researchers are studying Human Development at the University of Illinois and enjoy spending time with children. We hope to make this a fun experience for you and the children in your care. When measurements for the day are completed, you will receive reports in sealed envelopes for yourself and the children who participate in the study to give to their parents. Below we have provided further information regarding the study.

Who is conducting this research study?
Dr. Angela Wiley, a professor in the Department of Human and Community Development, and her research team are conducting this study.

What is the purpose of this study?
The purpose of this study is to better understand healthy development of children in family child care. In addition, we are interested in understanding the health and health practices of family child care providers.

What will I experience as a research participant?
Trained researchers will come to your family child care setting to do some fun activities with the children in your care and take a few health related measurements. They will come to your child care setting at a time you have approved and stay for 2 – 4 hours. The researcher will explain the process to you before any measurements are made and you may choose not to
determined through a scale like device. You will need to take off your socks and stand on a scale and hold two handles for 30 seconds. We will measure nutrition by having you remember everything you have eaten 24 hours prior to our arrival. We will ask you to enter this information on a website survey that typically takes 20-30 minutes. We will measure physical activity using a device somewhat similar to a pedometer, but it provides more accurate measurements. It is not uncomfortable and would be clipped to your right hip using an elastic belt. We may ask you to wear it for a short period, such as 2-4 hours, or to participate in a longer period, such as 4 days including one weekend day. The device cannot get wet so it would need to be removed when showering or during activities such as swimming. Other than those periods, we ask that you wear the device continuously to help us get the most accurate measurements possible.

We will also do a cholesterol check, diabetes screen, and measures of biological stress, which are measured through a simple finger stick just like what a person with diabetes uses to measure their daily sugar levels. These devices use minimal blood to produce results within a few minutes. The process is much easier and requires a smaller sample than the traditional method. A trained researcher will clean a finger of your choice (other than your thumb) with an alcohol pad, wait for it to dry, and then stick the finger with a tiny hidden needle. Your finger may be gently squeezed in order to get enough of a sample for the test. If possible, we will try to get all tests from the same stick. However, sometimes more than one stick is necessary to provide an adequate sample. After the sample is collected, a clean bandage will be placed on your finger. Finger sticks typically heal quickly.

We would also like to collect videotape recordings of everyday activities you and the children under your care participate in like playing and eating. We will be videoing short segments of about 5-30 minutes. The camera will be turned on at the beginning of the segment of a routine activity and then turned off at the end. The camera will be mounted on a tripod in an out of the way, safe location. Video recordings will be transferred to a secure computer database. The research team will then make research notes without any identifiers about the recordings. No one else will see the video recordings and the recordings will not be presented beyond the scope of the research team. Only these research notes will be used to talk about the findings of the study.

You will also be questions in the form of a written survey. You may choose to not answer any question at any point. At the end of all measurements, we will ask you a few questions in the form of an interview about your experience. With your permission, this interview may be recorded so that we can ensure accuracy capturing your responses. During this interview, you have the right to not answer any questions you prefer to not answer. We would also like to use your address to determine green space area around your child care home and health related measures such as distance to the nearest park or grocery store. Your address will be kept separately from all other data with only your unique code number. Only non-identifying information would be kept with any responses or numbers from your participation.

What will the children experience?
Trained researchers will do some fun activities with the children and take a few measurements on children who have parental consent. They will ask each child’s permission before making any measurements and a child may choose not to participate at any time. Measurements described already include: height and weight; body water, fat, and muscle percentages; and blood pressure. In addition, food preferences for children will be measured through pictures of several foods. The child will be asked to point to a smile for liking the food, a neutral expression, or a frown for disliking the food and then rank order each of the liked, neutral, and disliked foods. Physical activity measured through the device will be just like described above, but for a shorter time. For children, we may also observe children’s activity levels and patterns. Children will also be asked to participate in motor development activities. He or she will be asked to demonstrate skills such as jumping or running while the researcher records on video and paper the child’s skill level. We will also ask the child to point to one of two pictures of a cartoon child performing the same activities based on which one your child feels he/she looks more like.

What will happen to the measurements?
Providers and children that participate will be given a code number that will be stored with their measurements. This code will allow identities to remain confidential. All papers that have any measurements on them will only be for use of researchers in this study and will remain in a cabinet of a locked room. Any measurements entered into the computer will be stored only using the code and on a secure, password protected server. Only researchers will have access to the interview recordings and transcripts and the video recordings and research notes, all of which will be stored in a secure database. Your name or other identifying information will not be collected during the interviews to preserve your confidentiality.

How will the study information be used?
After the data collection portion of the study, we will summarize measurements and use the knowledge we gain to better design this study on health in family child care. Project reports and presentations will not include any identifying information. Information gained from this study in total will be used to offer recommendations to improve support services and inform policies related to family child care.

Are there any risks involved in my participation?
Your participation involves minimal risks comparable to those you experience in everyday life. There may be slight discomfort from the finger stick for the blood samples. It is possible for a small amount of bleeding to happen under the skin creating a bruise. The chance of an infection developing at the site is less than 1 in 1000. As for your data, it will not be accessible to anyone beyond the researchers conducting this study. Your participation in this study is voluntary and you may decide not to participate at any time.

Are there any risks involved for the children in my care’s participation?
Participation for children involves minimal risks comparable to those he or she experiences in everyday life. There are no physical risks involved. No one except the researchers will have access to the child’s individual data. Each child will be asked if he or she wants to participate in
a measurement. His or her participation is also voluntary and he or she may choose not to participate at any time.

What are the benefits to participating?
For your participation, you will receive a $40 Wal-Mart gift card at the time data collection is completed at your child care setting. In addition, we have found that many providers enjoy sharing their experiences and many people enjoy getting information related to their health. It may also feel good that the information you provide will go towards better understanding health in family child care and lead to the development of trainings and workshops that can benefit future family child care providers and the children in their care. In addition you will receive a report in a sealed envelope at the end, which will include your height, weight, information related to body mass composition, blood pressure, and results from your cholesterol and diabetes screens. Information regarding normal values and directions to pursue further information about these results will also be included in this report. These results are for research purposes and are not designed to assess or diagnose medical conditions. In addition, these results should not be taken as a replacement for seeing your doctor. In fact, we would recommend that you share these results with your doctor.

What are the benefits involved for children in my care to participating?
Children often enjoy seeing how tall they are getting or how much they weigh. The researchers will make the time spent at your setting taking measurements as fun as possible with songs, activities, and books. Parents of participating children will receive a report in a sealed envelope at the end of that day with their child’s height, weight, percent body fat, and blood pressure.
The decision to participate, decline, or withdraw from participation will have no effect on your status at or future relations with the Child Care Resource Service or the University of Illinois. If you choose to participate, researchers may also contact you at a later date to ask for your voluntary participation in other studies involving family care. You may choose whether or not to participate in those studies at that time.

Would you be willing to be contacted for future studies involving family care?
(please check one)

☐ YES  ☐ NO

Contact Information:
Please feel free to ask questions you have concerning this research at any time. You may contact the Child Care Resilience Program under the supervision of Dr. Angela Wiley at awiley@illinois.edu or 217-265-5279. If you have any questions about your rights as a participant in this study or any concerns or complaints, please contact the University of Illinois Institutional Review Board Office at 217-333-2670 (collect calls will be accepted if you identify yourself as a research participant) or via email at irb@illinois.edu. Please keep the attached copy of this letter for your records.

I (print name)________________________________________ have read and understand the above consent form and voluntarily agree to participate in this study.

Audio-recording: (please check one)

I give permission for my interview to be audio-recording.

☐ YES  ☐ NO

Video-recording: (please check one)

I give permission to being videotaped during routine activities such as playtime and eating time at my child care home.

☐ YES  ☐ NO

_____________________________  __________________
Signature  Date

UNIVERSITY OF ILLINOIS
APPROVED:  X  AUG 0 2 2016
Dear Family Child Care Provider,

The Child Care Resilience Program at the University of Illinois is interested in understanding health in family child care settings. You are invited to participate in this study assessing provider health. We would very much appreciate your help.

Measures will include height, weight, blood pressure, cholesterol, diabetes testing, and a measure of biological stress through a finger stick, a nutrition questionnaire, and answering questions on paper. After participating, you will receive a health report in a sealed envelope with your health information collected in the study. Below we have provided further information regarding the study.

Who is conducting this research study?
Dr. Angela Wiley, a professor in the Department of Human and Community Development, and her research team are conducting this study.

What is the purpose of this study?
The purpose of this study is to better understand healthy development of children in family child care. In addition, we are interested in understanding the health and health practices of family child care providers.

What will I experience as a research participant?
Trained researchers will ask you to help with some health measures either on site or at your child care home. Measurements are like what you may have experienced at your doctor’s office and all are very safe. We will measure your height and weight with your shoes off and blood pressure using an appropriate sized cuff and stethoscope. Body water, fat, and muscle percentages will be determined through a scale like device. You will need to take off your socks and stand on a scale and hold two handles for 30 seconds. We will measure nutrition by having you remember everything you have eaten 24 hours prior to our arrival. We will ask you to enter this information on a website survey that typically takes 20-30 minutes. We may ask you if you would help us measure physical activity using a device somewhat similar to a pedometer, but it provides more accurate measurements. It is not uncomfortable and would be clipped to your right hip using an elastic belt. We may ask you to wear it for 4 days including one weekend day. The device cannot get wet so it would need to be removed when showering or during activities such as swimming. Other than those periods, we ask that you wear the device continuously to help us get the most accurate measurements possible.

Telephone: 217-244-8586  -  Email: childcareresearch@illinois.edu
We will also do a **cholesterol check**, **diabetes screen**, and measures of **biological stress**, which are measured through a simple finger stick just like what a person with diabetes uses to measure their daily sugar levels. These devices use minimal blood to produce results within a few minutes. The process is much easier and requires a smaller sample than the traditional method. A trained researcher will clean a finger of your choice (other than your thumb) with an alcohol pad, wait for it to dry, and then stick the finger with a tiny hidden needle. Your finger may be gently squeezed in order to get enough of a sample for the test. If possible, we will try to get all tests from the same stick. However, sometimes more than one stick is necessary to provide an adequate sample. After the sample is collected, a clean bandage will be placed on your finger. Finger sticks typically heal quickly.

You will also be questions in the form of a written survey. You may choose to not answer any question at any point.

**What will happen to the measurements?**
Providers that participate will be given a code number that will be stored with their measurements. This code will allow identities to remain confidential. All papers that have any measurements on them will only be for use of researchers in this study and will remain in a cabinet of a locked room. Any measurements entered into the computer will be stored only using the code and on a secure, password protected server.

**How will the study information be used?**
After the data collection portion of the study, we will summarize measurements and use the knowledge we gain to better design this study on health in family child care. Project reports and presentations will not include any identifying information. Information gained from this study in total will be used to offer recommendations to improve support services and inform policies related to family child care.

**Are there any risks involved in my participation?**
Your participation involves minimal risks comparable to those you experience in everyday life. There may be slight discomfort from the finger stick for the blood samples. It is possible for a small amount of bleeding to happen under the skin creating a bruise. The chance of an infection developing at the site is less than 1 in 1000. As for your data, it will not be accessible to anyone beyond the researchers conducting this study. Your participation in this study is voluntary and you may decide not to participate at any time.

**What are the benefits to participating?**
For your participation, you will receive a $20 Wal-Mart gift card at the time data collection is completed. In addition, we have found that many providers enjoy sharing their experiences and many people enjoy getting information related to their health. It may also feel good that the information you provide will go towards better understanding health in family child care and lead to the development of trainings and workshops that can benefit future family child care providers and the children in their care. In addition you will receive a report in a sealed envelope at the end, which will include your height, weight, information related to body mass

*telephone: 217 244 8586 – email: childcareresearch@illinois.edu*
composition, blood pressure, and results from your cholesterol and diabetes screens. Information regarding normal values and directions to pursue further information about these results will also be included in this report. These results are for research purposes and are not designed to assess or diagnose medical conditions. In addition, these results should not be taken as a replacement for seeing your doctor. In fact, we would recommend that you share these results with your doctor.

The decision to participate, decline, or withdraw from participation will have no effect on your status at or future relations with the Child Care Resource Service or the University of Illinois. If you choose to participate, researchers may also contact you at a later date to ask for your voluntary participation in other studies involving family care. You may choose whether or not to participate in those studies at that time.

Would you be willing to be **contacted for future studies** involving family care? (please check one)

- [ ] YES
- [ ] NO

**Contact Information:**
Please feel free to ask questions you have concerning this research at any time. You may contact the Child Care Resilience Program under the supervision of Dr. Angela Wiley at awiley@illinois.edu or 217-265-5279. If you have any questions about your rights as a participant in this study or any concerns or complaints, please contact the University of Illinois Institutional Review Board Office at 217-333-2670 (collect calls will be accepted if you identify yourself as a research participant) or via email at irb@illinois.edu. Please keep this letter for your records.

_(print name)__________________________ have read and understand the above consent form and voluntarily agree to participate in this study._

_____________________________
Signature

_____________________________
Date

UNIVERSITY OF ILLINOIS
AND AFFILIATES

AUG 02 2016

telephone: 217-244-8586 – email: childcareresearch@illinois.edu

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Appendix D: Survey Measures for Studies 1 and 2 with Citations

Cardiovascular Health Questions in Pre-survey

1. Have you EVER been told by a doctor, nurse or other health professional that you have high blood pressure?
   - Yes
   - Yes, but I have only been told during pregnancy (if female)
   - No
   - I have been told my blood pressure is borderline high or prehypertensive
   - Don’t know/Not sure

   If yes, are you currently taking medicine for your high blood pressure?
   - Yes
   - No
   - Don’t know/Not sure

2. Blood cholesterol is a fatty substance found in the blood. Have you EVER had your blood cholesterol checked?
   - Yes
   - No
   - Don’t know/Not sure

   If yes, about how long has it been since you last had your blood cholesterol checked?
   - Within the past year (anytime less than 12 months ago)
   - Within the past 2 years (1 year but less than 2 years ago)
   - Within the past 5 years (2 years but less than 5 years ago)
   - 5 or more years ago
   - Don’t know/Not sure

3. Have you EVER been told by a doctor, nurse or other health professional that your blood cholesterol is high?
   - Yes
   - No
   - Don’t know/Not sure

4. Have you ever had your blood sugar tested or a test for diabetes?
   - Yes
   - No
   - Don’t know/Not sure

   If yes, about how long has it been since you last had your blood sugar checked?
   - Within the past year (anytime less than 12 months ago)
   - Within the past 2 years (1 year but less than 2 years ago)
   - Within the past 3 years (2 years but less than 3 years ago)
   - 3 or more years ago
   - Don’t know/Not sure
5. Has a doctor, nurse, or other health professional ever told you that you had diabetes?
   - Yes
   - Yes, but only during pregnancy (if female)
   - No
   - No, but I have been told I have pre-diabetes or am borderline diabetes
   - Don’t know/Not sure

6. Has a doctor, nurse, or other health professional ever told you that you had any of the following…

<table>
<thead>
<tr>
<th>Condition</th>
<th>Yes</th>
<th>No</th>
<th>Don’t know/Not Sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>A heart attack (also called a myocardial infarction)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Angina or Coronary Heart Disease</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>A stroke</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>Asthma</td>
<td>☐</td>
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<tr>
<td>If you had asthma, do you still have asthma?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Skin cancer</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>Other types of cancer</td>
<td>☐</td>
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<td>☐</td>
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<tr>
<td>Chronic Obstructive Pulmonary Disease (COPD), emphysema or chronic bronchitis</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Some form of arthritis, rheumatoid arthritis, gout, lupus, or fibromyalgia *</td>
<td>☐</td>
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<td>☐</td>
</tr>
<tr>
<td>A depressive disorder, including depression, major depression, dysthymia, or minor depression</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

*Arthritis diagnoses include: rheumatism, polymyalgia rheumatica; osteoarthritis (not osteoporosis); tendonitis, bursitis, bunion, tennis elbow; carpal tunnel syndrome, tarsal tunnel syndrome; joint infection, etc.

7. About how tall are you without shoes?
   _________ft   _________in

8. About how much do you weigh in pounds without shoes?
   _____________________lbs

Demographic Questions

1. What is your age? __________ years

2. Are you…?
   - Married
   - Divorced
   - Widowed
   - Separated
   - Never married
   - A member of an unmarried couple

3. How do you identify your race/ethnicity?
   - African-American
   - Asian/Pacific Islander
   - Caucasian/White
   - Multi-racial
   - Hispanic/Latino
   - Other ________________________
   - Native American

4. Is your annual household income from all sources—
   - <$10,000
   - $10,000 to <$15,000
   - $15,000 to <$20,000
   - $20,000 to <$25,000
   - $25,000 to <$35,000
   - $35,000 to <$50,000
   - $50,000 to <$75,000
   - $75,000 or more
   - Don’t know / Not sure


5. In the past two years, have you received any of the following types of financial assistance? (check all that apply)
   - TANF/AFDC
   - Medicaid/Medicare for yourself
   - Medicaid for your child(ren)
   - Subsidized housing/Section 8
   - Food stamps/SNAP
   - FamilyCare for yourself
   - KidCare for your child(ren)
   - Other (specify) ________________________
   - None
6. **What is the highest level of education you have completed?** (Check one)

- Some high school
- High school graduate/GED
- Some college classes in early childhood education or child development, no degree
- Approved Community College Early Childhood Certificate
- Associates degree with early childhood education or child development major
- Associates degree in another field
- Bachelor’s degree in early childhood education or child development
- Bachelor’s degree in another field
- Master’s degree or higher in early childhood education or child development
- Master’s degree or higher in another field
- Other (specify) _______________________________________

7. **Does at least one other adult in your household contribute to your household income?**

- Yes  
- No  

8. **If yes, who pays for your health insurance?** (check one)

- My spouse’s employer pays 100%
- My spouse’s employer pays a partial amount
- I purchase my own health insurance
- I am Medicaid/Medicare eligible
- Other (specify)_________________________________


9. **How many people are currently living in your household, including yourself?**

   _______ Number of people
   _______ Of these people, how many are children?
   _______ Of these people, how many are adults?

MacArthur SES & Health Network | Research | Social Environmental Notebook.  
http://www.macses.ucsf.edu/research/socialenviron/sociodemographic.php

10. **What sex were you assigned at birth, on your original birth certificate?**

- Male  
- Female  

11. **How do you describe yourself?**

- Male  
- Transgender  
- Female  
- Do not identify as female, male or transgender

General Health and Access to Care Questions

1. **Would you say that in general your health is—**
   - [ ] Excellent
   - [ ] Very good
   - [ ] Good
   - [ ] Fair
   - [ ] Poor
   - [ ] Don’t know/Not sure

2. **This question is about your emotional support. How often do you get the social and emotional support you need?**
   - [ ] Always
   - [ ] Usually
   - [ ] Sometimes
   - [ ] Rarely
   - [ ] Never
   - [ ] Don’t know/Not sure

3. **This question is about your satisfaction with life. In general, how satisfied are you with your life?**
   - [ ] Very Satisfied
   - [ ] Satisfied
   - [ ] Dissatisfied
   - [ ] Very Dissatisfied
   - [ ] Don’t know/Not sure

4. **Do you have one person you think of as your personal doctor or health care provider?**
   - [ ] Yes, only one
   - [ ] More than one
   - [ ] No
   - [ ] Don’t know / Not sure

5. **About how long has it been since you last visited a doctor for a routine checkup?**
   - *A routine checkup is a general physical exam, not an exam for a specific injury, illness, or condition.*
   - [ ] Within the past year (anytime less than 12 months ago)
   - [ ] Within the past 2 years (1 year but less than 2 years ago)
   - [ ] Within the past 5 years (2 years but less than 5 years ago)
   - [ ] 5 or more years ago
   - [ ] Don’t know / Not sure
   - [ ] Never
6. **Was there a time in the past 12 months when you needed to see a doctor for **yourself, **but could not because of cost?**
   - [ ] Yes
   - [ ] No
   - [ ] Don’t know / Not sure

7. **Other than cost, there are many other reasons people delay getting needed medical care. Have you delayed getting needed medical care for yourself for any of the following reasons?**
   - [ ] You couldn’t get through on the telephone
   - [ ] You couldn’t get an appointment soon enough
   - [ ] Once you got there, you had to wait too long to see the doctor
   - [ ] The (clinic/doctor’s) office wasn’t open when you got there
   - [ ] You didn’t have transportation
   - [ ] No, I did not delay getting medical care/did not need medical care
   - [ ] Don’t know/Not sure
   - [ ] Other (please specify) _________________________________________

8. **How long has it been since you last visited a dentist or dental clinic for any reason for **yourself?** *(Include visits to dental specialists, such as orthodontists.)*
   - [ ] Within the past year (anytime less than 12 months ago)
   - [ ] Within the past 2 years (1 year but less than 2 years ago)
   - [ ] Within the past 5 years (2 years but less than 5 years ago)
   - [ ] 5 or more years ago
   - [ ] Don’t know / Not sure
   - [ ] Never

9. **Do you have any kind of health care coverage?**
   *Include health insurance, prepaid plans such as HMOs, government plans such as Medicare, or Indian Health Service as having health coverage.*
   - [ ] Yes
   - [ ] No
   - [ ] Don’t know / Not sure

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Physical Activity Module

1. The next few questions are about exercise, recreation, or physical activities other than your regular job duties.
   a. During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?
      □ Yes  □ No  □ Don’t know / Not sure
   b. What type of physical activity or exercise did you spend the most time doing during the past month? [Please specify the activity (e.g., walking, running, biking, etc.)]

                  ______________________________
   i. How many times per week did you take part in this activity during the past month?
      __________ Times per week  □ Don’t know / Not sure
   ii. And when you took part in this activity, for how many minutes did you usually keep at it each time?
      __________ minutes  □ Don’t know / Not sure
   c. What other type of physical activity gave you the next most exercise during the past month? [Please specify the activity (e.g., walking, running, biking, etc.)]

                  ______________________________
   iii. How many times per week did you take part in this activity during the past month?
      __________ Times per week  □ Don’t know / Not sure
   iv. And when you took part in this activity, for how many minutes did you usually keep at it each time?
      __________ minutes  □ Don’t know / Not sure

2. During the past month, how many times per week did you do physical activities or exercises to STRENGTHEN your muscles?  
   Do NOT count aerobic activities like walking, running, or bicycling. Count activities using your own body weight like yoga, sit-ups or push-ups and those using weight machines, free weights, or elastic bands.

      __________ Times per week  □ Don’t know / Not sure

Global Physical Activity Questions

1. Do YOU do any vigorous-intensity sports, fitness or recreational (leisure) activities that cause large increases in breathing or heart rate like running for at least 10 minutes continuously? (Examples: basketball, volleyball, swimming, cycling, or running)
   □ Yes □ No
   
   a. In a typical week, on how many days do YOU do vigorous-intensity sports, fitness or recreational (leisure) activities?
      __________ days

2. Do YOU do any moderate-intensity sports, fitness or recreational (leisure) activities that cause a small increase in breathing or heart rate for at least 10 minutes continuously? (Examples: brisk walking, dancing housework, or domestic chores)
   □ Yes □ No
   
   a. In a typical week, on how many days do YOU do vigorous-intensity sports, fitness or recreational (leisure) activities?
      __________ days


Smoking Status

1. Do you currently smoke tobacco on a daily basis, less than daily, or not at all?
   □ Daily
   □ Less than daily
   □ Not at all
   □ Don’t know

Sugar Sweetened Beverages Module

1. During the past 30 days, how often did you drink regular soda or pop that contains sugar? Do not include diet soda or diet pop. (Answer as the number of times per week you had soda or pop)

____________ times per week

2. During the past 30 days how often did you drink sweetened fruit drinks, such as Kool-Aid, cranberry juice cocktail, and lemonade? (Answer as the number of times per week you had sweetened fruit drinks)
   Include fruit drinks you made at home and added sugar to.
   Fruit drinks are sweetened beverages that often contain some fruit juice or flavoring. Do not include 100% fruit juice, sweet tea, coffee drinks, sports drinks, or energy drinks.

____________ times per week


Sleep

1. Next we would like to ask you about your sleep pattern. On average, how many hours of sleep do you get in a 24-hour period?

____________ hours

Fruits and Vegetables Module
These next questions are about the fruits and vegetables you ate or drank during the PAST 30 DAYS. Please think about all forms of fruits and vegetables including cooked or raw, fresh, frozen or canned. Please think about all meals, snacks, and food consumed at home and away from home.

1. How many times per week did you drink 100% PURE fruit juices?  
   Do not include fruit–flavored drinks with added sugar or fruit juice you made at home and added sugar to. Only include 100% juice.
   ___________ times per week

2. How many times per week, not counting juice, did you eat fruit?  
   Count fresh, frozen, or canned fruit.
   ___________ times per week

3. How many times per week did you eat cooked or canned beans, such as refried, baked, black, garbanzo beans, beans in soup, soybeans, edamame, tofu or lentils.  
   Do not include long green beans.
   ___________ times per week

4. How many times per week did you eat dark green vegetables for example broccoli or dark leafy greens including romaine, chard, collard greens or spinach?
   ___________ times per week

5. How many times per week did you eat orange colored vegetables such as sweet potatoes, pumpkin, winter squash, or carrots?
   ___________ times per week

6. Not counting what you previously answered, about how many times per week did you eat OTHER vegetables?
   ___________ times per week

**Family History of Heart Attack**

1. Did your Mother or Father have a heart attack before age 60?
   - [ ] Yes
   - [ ] No
   - [ ] My mother and father are younger than age 60 and have not had a heart attack
   - [ ] Don’t know/Not sure

Adapted from Reynolds Risk Score. Option added about mother and father being younger than 60 since some participants were emerging adults.


**Childhood Socioeconomic Status Estimation**

1. What was the highest educational level your father (or a male head of household) who raised you for most of the time before you turned 17?
   - [ ] Some high school or less
   - [ ] High school graduate/general educational development (GED) certificate
   - [ ] Some college classes or more

2. What was the highest educational level your mother (or a female head of household) who raised you for most of the time before you turned 17?
   - [ ] Some high school or less
   - [ ] High school graduate/general educational development (GED) certificate
   - [ ] Some college classes or more

Family Child Care Provider Practice Characteristics

1. Do you care for any of your:  
   - own children?  □ Yes □ No  
   - relative’s children?  □ Yes □ No

2. How long have you been taking care of children in your home for pay?  __________ years

3. How many assistant caregivers do you have?  __________ (Number)

4. Have you ever been employed as a child care center teacher, child care center assistant, or child care center director or as a public school teacher?  
   □ Yes □ No  
   If YES, for how many years?  __________ years

5. How many children in your care do you have in the following age ranges:  
   ______ Infants (6 weeks to 14 months)  
   ______ Toddlers (15 to 23 months)  
   ______ 2’s (24-35 months)  
   ______ Preschool (3yrs. to <5yrs.)  
   ______ Kindergarteners (5 yrs. to 71 months)  
   ______ School Ages (6 yrs. to 12 yrs.)

6. During a typical week, what is the largest number of children in your care at any time – excluding your own children?  __________(Number)

7. Using the following scale, circle the response that best describes your enrollment pattern.

   1  2  3  4  5  
There are always vacancies  There are often vacancies  There are sometimes vacancies  There are rarely vacancies  There are never vacancies

8. In the past two years, have you considered no longer providing care?  □ Yes □ No

9. How many children whose families receive IDHS and/or IDCFS child care financial assistance (subsidy) do you care for?  __________ Number

10. Are you paid when children are absent because they are sick?  □ Yes □ No
11. Are you paid when you are closed for sick days?  □ Yes □ No
12. In the last year, did you receive any health related training?  □ Yes □ No

13. Do you participate in the Child and Adult Care Food Program (CACFP)?  □ Yes □ No
14. On average, how many hours per week are you paid for taking care of children (not counting your own children)? __________ hours per week

15. Are you licensed or regulated by the state?  □Yes  □No

16. Do you currently hold a(nother) paid job (to supplement your child care income)?  □Yes  □No

17. In a typical month, how much money do you earn from caring for children? (This includes cash, vouchers, subsidies or any other monetary sources.)

   $___ ___, __ __ __ 

   If you don’t know the exact amount, do you earn:
   □About $200 per month or less 
   □$201 to $400 
   □$401 to $600 
   □$601 to $800 
   □$801 to $1000 
   □Or more than $1000 a month? 
   □Don’t Know

**Provider Influence on Children in Care**

How much influence do you think *child care providers* have on each of the following for a child?

<table>
<thead>
<tr>
<th></th>
<th>None</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>A lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food Preferences</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Eating Habits</td>
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<tr>
<td>Physical Activity</td>
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<td></td>
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<tr>
<td>Weight Status</td>
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</tbody>
</table>


**Provider Job Satisfaction**

Please tell me the extent to which you agree with the following statements on providing care.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree nor Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. If I could start over, I would choose child care again as my career.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Adapted question from question used in ECLS-b and Fragile Families.


Adapted Sedentary Questions from International Physical Activity Questionnaire

The following question is about sitting or reclining at work, at home, while getting to and from places, or while with friends. How much time do you usually spend sitting or reclining on a typical day for each of the following:

- Sitting at a desk? ___:_____
  Hours  Minutes
- Sitting with friends, family or children? ___:_____
  Hours  Minutes
- Traveling in a car, bus, or train? ___:_____
  Hours  Minutes
- Reading? ___:_____
  Hours  Minutes
- Playing cards or watching television? ___:_____
  Hours  Minutes
- Other (please specify) _________________ ___:_____
  Hours  Minutes

Adapted from the IPAQ. Categories were reported on individually and then summed to obtain total sedentary time per day.

**Center for Epidemiologic Studies Depression Scale**

Below is a list of some of the ways you may have felt or behaved. Please indicate how often you’ve felt this way during the **PAST WEEK**. Please respond to all items.

<table>
<thead>
<tr>
<th>During the past week...</th>
<th>Rarely or none of the time (less than 1 day)</th>
<th>Some or a little of the time (1-2 days)</th>
<th>Occasionally or a moderate amount of the time (3-4 days)</th>
<th>All of the time (5-7 days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I was bothered by things that usually don’t bother me.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>2. I did not feel like eating; my appetite was poor.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>3. I felt that I could not shake off the blues even with help from my family.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td><strong>4. I felt that I was just as good as other people.</strong></td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>5. I had trouble keeping my mind on what I was doing.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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</tr>
<tr>
<td>6. I felt depressed.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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</tr>
<tr>
<td>7. I felt that everything I did was an effort.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td><strong>8. I felt hopeful about the future.</strong></td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>9. I thought my life had been a failure.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>10. I felt fearful.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>11. My sleep was restless.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td><strong>12. I was happy.</strong></td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>13. I talked less than usual.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>15. People were unfriendly.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td><strong>16. I enjoyed life.</strong></td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>17. I had crying spells.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>18. I felt sad.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>19. I felt that people disliked me.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>20. I could not “get going.”</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

Scored 0 to 3 with bolded (positively worded) items reversed scored. A total score of 16 or higher was considered a positive screen for depression.

Fruits and Veggies Stages of Change Measure

How many servings of fruits and vegetables do you usually eat each day? (Please circle your response and follow the arrows to the next question)

0 1 2 3 4

If you answered 0 to 4, please follow this arrow to your next question.

5 6 or more

If you answered 5 or more, please follow this arrow to your next question.

Have you been eating five or more servings of fruits and vegetables a day for more than 6 months?

☐ Yes ☐ No

If you followed the arrows to this question, please move on to question XX after answering.

Do you intend to start eating five or more servings of fruits and vegetables a day in the next 6 months?

☐ Yes ☐ No

If you answered NO, please move on to question XX.

Categorized into stages as follows based on Noia et al. (2012):

- **Precontemplation** – 0 to 4 fruits and veggies per day and do not intend to starting eating 5 or more in the next 6 months
- **Contemplation** – 0 to 4 fruits and veggies per day and plans to eat 5 or more in the next 6 months
- **Preparation** – 0 to 4 fruits and veggies per day and plans to eat 5 or more in next month
- **Action** – 5 or more fruits and veggies per day and has been eating them for less than 6 months
- **Maintenance** – 5 or more fruits and veggies per day and has been doing so for more than 6 months

Physical Activity Stages of Change Measure

1. Physical activity includes activities such as brisk walking, jogging, cycling, swimming, or any other activity, such as gardening, in which the exertion makes you feel warmer or slightly out of breath. (Based on this information, please answer the following statements)

   a) I am currently physically active.
      - Yes   - No

   b) I intend to become more physically active in the next 6 months.
      - Yes   - No

2. For activity to be regular, it must add up to a total of 30 minutes or more per day and be done at least 5 days per week. For example, you could take one 30-minute walk or take three 10-minute walks. (Based on this information, please answer the following statements)

   a) I currently engage in regular physical activity.
      - Yes   - No

   b) I have been regularly physically active for the past 6 months.
      - Yes   - No

Categorized as into stages as follows based on Marcus et al. (2003):

- **Precontemplation** – Not currently physically active and do not intend to become physically active in the next 6 months (1a = No; 1b = No)
- **Contemplation** – Not currently physically active, but intend to become more physically active in the next 6 months (1a = No; 1b = Yes)
- **Prepartion** Currently physically active, but do not currently engage in regular physical activity (1a = Yes; 2a = No)
- **Action** – Currently physically active and currently engage in regular physical activity, but has not been regular for past 6 months (1a = Yes; 2a = Yes; 2b = No)
- **Maintenance** – Currently physically active and currently engage in regular physical activity and it has been regular for past 6 months (1a = Yes; 2a = Yes; 2b = Yes)

**Brief Resilience Scale**

Indicate how much you disagree or agree with each statement.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I tend to bounce back quickly after hard times.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>2. I have a hard time making it through stressful events.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>3. It does not take me long to recover from a stressful event.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>4. It is hard for me to snap back when something bad happens.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>5. I usually come through difficult times with little trouble.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>6. I tend to take a long time to get over set-backs in my life.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

Bolded (negatively worded) items were reverse coded. The average of the six items was then taken to create the brief resilience scale.

USDA Food Security Survey Module: Six Item Short Form

Below are several statements that people have made about their food situation. For these statements, please tell us whether the statement was often true, sometimes true, or never true for you/your household in the last 12 months.

1. (HH3) “The food that I/we bought just didn’t last, and I/we didn’t have money to get more.”
   Was that often, sometimes, or never true for you/your household in the last 12 months?
   [ ] Often true
   [ ] Sometimes true
   [ ] Never true
   [ ] Don’t know

2. (HH4) “I/we couldn’t afford to eat balanced meals.”
   Was that often, sometimes, or never true for you/your household in the last 12 months?
   [ ] Often true
   [ ] Sometimes true
   [ ] Never true
   [ ] Don’t know

3. (AD1) In the last 12 months, did you/you or other adults in your household ever cut the size of your meals or skip meals because there wasn't enough money for food?
   [ ] Yes    [ ] No    [ ] Don’t Know

   (AD1a) If YES, How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?
   [ ] Almost every month
   [ ] Some months but not every month
   [ ] Only 1 or 2 months
   [ ] Don’t know

4. (AD2) In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money for food?
   [ ] Yes    [ ] No    [ ] Don’t know

5. (AD3) In the last 12 months, were you every hungry but didn't eat because there wasn't enough money for food?
   [ ] Yes    [ ] No    [ ] Don’t Know
Food security status was assessed per instructions as follows:

- For items HH3 and HH4, often and sometimes were coded as affirmative.
- For AD1, AD2, and AD3, yes was coded as affirmative.
- For AD1a, almost every month and some months but not every month were coded as affirmative.
- The sum of affirmative responses was calculated and categorized as follows:
  - Raw score 0-1—High or marginal food security (raw score 1 may be considered marginal food security, but a large proportion of households that would be measured as having marginal food security using the household or adult scale will have raw score zero on the six-item scale)
  - Raw score 2-4—Low food security
  - Raw score 5-6—Very low food security

**USDA Nutrition Health Beliefs Questions**

Below are some statements about what people eat. Please tell us if you strongly agree, somewhat agree, somewhat disagree, or strongly disagree with the statement by checking the appropriate box.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree (4)</th>
<th>Somewhat Agree (3)</th>
<th>Somewhat Disagree (2)</th>
<th>Strongly Disagree (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Choosing a healthy diet is just a matter of knowing what foods are good and what foods are bad.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Eating a variety of foods each day probably gives you all the vitamins and minerals you need.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Some people are born to be fat and some thin; there is not much you can do to change this.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Starchy foods, like bread, potatoes, and rice, make people fat.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. There are so many recommendations about healthy ways to eat, it's hard to know what to believe.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. What you eat can make a big difference in your chance of getting a disease, like heart disease or cancer.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. The things I eat and drink now are healthy so there is no reason for me to make changes.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


**Self-Reported Diet Quality**

1. Next is a question about your eating habits. In general, how health is your overall diet? Would you say…

   - Excellent
   - Very good
   - Good
   - Fair
   - Poor
   - Don’t know

Perceived Stress Scale

The questions in this scale ask you about your feelings and thoughts during THE LAST MONTH. In each case, you will be asked to indicate your response representing HOW OFTEN you felt or thought a certain way.

Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer fairly quickly. That is, don’t try to count up the number of times you felt a particular way, but rather indicate what seems like a reasonable estimate.

<table>
<thead>
<tr>
<th>In the last month …</th>
<th>Never 0</th>
<th>Almost Never 1</th>
<th>Sometimes 2</th>
<th>Fairly Often 3</th>
<th>Very Often 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. You were upset because something happened unexpectedly?</td>
<td>□ □ □ □ □</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. You were unable to control the important things in your life?</td>
<td>□ □ □ □ □</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. You felt nervous and “stressed”?</td>
<td>□ □ □ □ □</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. You dealt successfully with irritating life hassles?</td>
<td>□ □ □ □ □</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. You felt that you were effectively coping with important changes that were occurring in your life?</td>
<td>□ □ □ □ □</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. You felt confident about your ability to handle your personal problems?</td>
<td>□ □ □ □ □</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. You felt that things were going your way?</td>
<td>□ □ □ □ □</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. You found that you could not cope with the things you had to do?</td>
<td>□ □ □ □ □</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. You were able to control irritations in your life?</td>
<td>□ □ □ □ □</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. You felt that you were on top of things?</td>
<td>□ □ □ □ □</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. You been angered because things that happened that were outside of your control?</td>
<td>□ □ □ □ □</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. You found yourself thinking about things that you have to accomplish?</td>
<td>□ □ □ □ □</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. You were able to control the way you spend your time?</td>
<td>□ □ □ □ □</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. You felt difficulties were piling up so high that you could not overcome them?</td>
<td>□ □ □ □ □</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Bolded (positively worded) items were reverse scored and then a total score was obtained by summing across all 14 items.

Multidimensional Scale of Perceived Social Support

Please read each statement carefully. Indicate how you feel about each statement.

<table>
<thead>
<tr>
<th>Statement</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. My family really tries to help me.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. I get the emotional help and support I need from my family.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. My friends really try to help me.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. I can count on my friends when things go wrong.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. I can talk about my problems with my family.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. I have friends with whom I can share my joys and sorrows.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>7. My family is willing to help me make decisions.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>8. I can talk about my problems with my friends.</td>
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<td></td>
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</tr>
<tr>
<td>9. I have at least one other child care provider that really tries to help me.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>10. I can count on at least one other child care provider when things go wrong.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. I have at least one other child care provider with whom I can share my joys and sorrows.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. I can talk about my problems with at least one other child care provider.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The average of the four items for each subscale was calculated.

**Family Subscale**
Items 1, 2, 5, and 7 made up the family subscale (bolded items).

**Friends Subscale**
Items 3, 4, 6, and 8 made up the friends subscale (underlined items)

**At Least One Other Child Care Provider Subscale**
The friends subscale was adapted and added as items 9, 10, 11, and 12 (italicized items)

Study 2: InBody Questionnaire

1. Do you have a pacemaker? 
   Yes  No
2. Have you had anything to eat in the last 4 hours? 
   Yes  No
3. Have you exercised in the last 12 hours? 
   Yes  No
4. Have you consumed alcohol in the last 24 hours? 
   Yes  No
5. Have you had any caffeine today? 
   Yes  No
6. Have you put lotion on your hands or feet today? 
   Yes  No
7. Have you taken a shower within the last four hours? 
   Yes  No
8. Are you currently on your menstrual cycle? 
   Yes  No