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Latinx Child Farmworkers in North Carolina: Study Design and Participant Baseline Characteristics

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Abstract

Background: Although children as young as 10 years can work in agriculture, little research has addressed their occupational health. This paper describes a large, multicomponent study of hired Latinx child farmworkers, and the characteristics of children participating in this study.

Methods: Survey interviews were conducted in 2017 with 202 Latinx children aged 10 to 17 years employed in agriculture across North Carolina (NC).

Results: Most (81.2%) participants were born in the US, 37.6% were female, and 21.3% were aged 10–13 years. Most (95.1%) were currently enrolled in school. Thirty-six (17.8%) were migrant workers. 34.7% had worked in agriculture for one year; 18.3% had worked 4+ years.

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33.7% worked piece rate. 57.4% worked in tobacco. Participants in western NC differed in personal and occupational characteristics from those in eastern NC.

Conclusions: This study has enrolled a large and diverse child farmworker sample. This overview indicates several important issues for further analysis.

Keywords

Agricultural safety; occupational health; child labor; minority health; vulnerable populations

1 INTRODUCTION

Agriculture is unique among industries in the United States (US) for its child labor practices.[1–3] Due to "agricultural exceptionalism,"[4] the circumstance that most federal or state labor laws do not apply to agriculture, children of any age can and do work on farms operated by their parents. Children as young as 10 years can be hired to work on farms not operated by their relatives.[5] Labor rules posted by the US Department of Labor, Wage and Hour Division[6] state that a child aged 16 years or older can hold any farm job, hazardous or not, with unlimited work hours; a child aged 14 or 15 years can hold any nonhazardous farm job outside school hours; a child aged 12 or 13 years can hold any nonhazardous farm job outside school hours with parental permission or on the same farm on which a parent is working; and a child aged 10 or 11 years can hold any nonhazardous farm job outside of school hours with parental permission when Fair Labor Standard Act minimum wage requirements do not apply (i.e., on small farms).

Agriculture is one of the most hazardous US industries.[7] Those employed in agriculture are exposed to environmental (heat, sun), mechanical, chemical (pesticides, fertilizers, petrochemicals), height (ladders, buildings), sharp tool, and sexual abuse hazards. As a result, children working on farms experience high rates of injury, illness, and mortality.[8–11]

Although children are allowed to work in this hazardous industry, little research has documented risk factors for immediate injury and illness among these children, or determined the long-term health and developmental consequences of this work. Studies published between 1997 and 2007 addressed a variety of child agricultural health and safety issues, but focused on children working on parent-operated farms rather than children hired to work on farms not operated by a parent or other relative.[12–23] Since 2007, McCurdy has examined the occupational health and safety of California high school students working on their parents' farms, comparing them to high school students hired to do farm work.[24–26] Gorucu et al.[27] examined occupational and non-occupational "youth" (under age 20) farm fatalities. Jinnah et al.[28] found that permissive parenting, defined as lax-inconsistent disciplining, predicted unsafe farm behaviors. Summers et al.[29] examined the safety and health perceptions of parents and their children working on farms engaged in local market production. Kim et al.[30] found variation in the agricultural injuries experienced by different classes of Canadian children (e.g., rural-living farm children, rural-living non-farm children, rural First Nations children), and argued that specific strategies are needed to prevent agricultural injuries in each group.

Children hired to work on farms are particularly vulnerable.[5] Like adult farm labor, a large proportion of these children are minority, particularly Latinx .[31] In addition to other hazards, some migrant hired child farmworkers are unaccompanied by parents or other adults.[32] The limited research on the occupational health and safety of hired child farmworkers includes analysis of data on youth farmworkers from the 2000–2009 National Agricultural Workers Survey (NAWS), as well as regional studies of child farmworkers conducted on the West Coast (Washington, Oregon, California), in Texas, and in North Carolina (NC).

In an analysis of "youth" farmworkers aged 14 to 18 years, Gabbard et al.[31] used NAWS data to provide an overview of child farmworker personal characteristics and field sanitation. They estimated that, between the years 2000 and 20009, approximately 84,000 youth aged 14 to 18 years work as farmworkers each year. These youth were largely (85%) male and most (74%) had been in the United States for less than two years. Most (60%) reported Spanish as their primary language. Most reported that their employers provided sufficient materials (water, soap, towels) for field sanitation, and 75% reported receiving pesticide training. However, the high proportion of 18 year old adults in the sample (45% of the entire sample) makes direct comparisons with studies of child farmworkers difficult and unreliable.

About half (53%) of the 140 youth interviewed by Perla and colleagues[33] in Washington's Yakima Valley reported receiving safety training, but few could correctly identify legally restricted tasks considered hazardous for youth workers. McCauley and colleagues[34] reported that one-third of the 108 adolescent farmworkers they interviewed in Oregon received pesticide training, although 21.6% reported work that involved mixing or applying agricultural chemicals. In focus groups with Oregon adolescent migrant farmworkers, Salazar and colleagues[36] found that they were aware of the risks from pesticide exposure, but varied in their perceptions of their personal vulnerability. In California, McCurdy and Kwan[26] compared Latinx and non-Latinx high school students working on California farms in the previous year. Most of the non-Latinx students were working on farms owned by their parents, while the Latinx students were hired to work on farms not owned by family members. Latinx students worked fewer hours and were less likely to perform hazardous tasks that involved tractors, machinery, and chemicals than were non-Latinx students. Hennessy-Burt and colleagues,[36] using data from the MICASA Study, reported that the 36 adolescent farmworkers they interviewed who were employed in the previous 12 months worked an average of about 4 weeks in the previous year doing a variety of agricultural tasks.

Shipp and colleagues have completed several analyses of Texas high school students employed in agriculture. They found that one-in-five adolescent farmworkers received pesticide safety training,[37] a substantial percentage (15.7% to 19.1%) reported severe back pain,[38] and experienced high rates (27.0–73.6/100 full time equivalents) of non-fatal injury. [39] These adolescent farmworkers reported high levels of neurotoxicity symptoms, which had positive associations with injury.[40]

Spears and colleagues[41] described a heat illnesses intervention for NC child farmworkers that incorporated peer-educators. Arcury and colleagues[42] conducted a pilot study of NC child farmworkers aged 10 to 17 years recruited outside of the school setting. Most (78.2%)

of these children had been born in the US. Over half reported a musculoskeletal injury (54.0%), a traumatic injury (60.9%), or a dermatological injury (72.4%) in the last year. These child workers reported a poor work safety climate and safety culture on the farms that employed them,[43–44] few (5.7%) reported they received pesticide safety training, and 38% stated that supervisors were only interested in "doing the job quickly and cheaply." Most child farmworkers reported engaging in unsafe work behaviors (e.g., fewer than 6% wore safety goggles, hearing protection, or a respirator); at least 10% experienced sexual harassment at work.

Detailed research on characteristics, working conditions, and health and development outcomes of hired Latinx child farmworkers is needed. This paper has two objectives. First, it describes the study design for a large, multicomponent study of hired NC Latinx child farmworkers. Second, it describes baseline characteristics of Latinx child farmworkers participating in this study.

2 METHODS

2.1 Study Design

The Hired Child Farmworker Study is a mixed methods investigation consisting of: (1) in-depth interviews of 30 child farmworkers completed in 2016; and (2) a prospective cohort study with repeated survey interviews and clinical examinations conducted for three years with 200 child farmworkers to be completed from 2017 to 2019. This paper is limited to data from the first year survey interviews conducted for the prospective cohort study. The study protocol was approved by the Wake Forest School of Medicine Institutional Review Board.

The study has three specific aims. The first is to describe the common work experiences of hired Latinx child farmworkers. The second is to delineate the personal and developmental characteristics, work characteristics, work organization, and work safety culture of hired Latinx child farmworkers, the work related occupational, environmental, and social hazards they experience, and their emotional, behavioral, and physical health characteristics. The final aim is to determine the associations of Latinx child farmworker work characteristics and hazards with their health characteristics, and how the associations of work characteristics and hazards with health are affected by their work organization, safety culture, and developmental characteristics.

The study uses a community-based participatory research collaboration of investigators from Student Action with Farmworkers (SAF), Wake Forest School of Medicine, and East Carolina University. It is based on a pilot study completed in 2013 by these collaborators, along with colleagues at the NC Justice Center and NC FIELD.[42–44]

In addition to SAF co-investigators and youth co-investigators through the SAF *Levante Leadership Institute*,[45] the study is informed by a professional advisory committee that includes representatives from the NC Farmworker Health Program, NC Justice Center, Toxic Free NC, NC Migrant Education Program, Farm Labor Organizing Committee, and NC FIELD, and a youth advisory committee consisting of members of the SAF *Levante Leadership Institute*. The investigators continue to engage organizations serving

farmworkers through annual presentations at the NC Farmworker Institute and the NC Migrant Education Program Out-of-School Youth Conference. In 2014, the investigators conducted group interviews with youth farmworkers at the Out-of-School Youth Conference and a meeting of the *Levante Leadership Institute* to gain youth suggestions on what would be acceptable to include in the research.

2.2 Participant recruitment

Inclusion criteria were: (1) age 10 to 17 years at recruitment; (2) self-identify as Latinx; (3) employed to do farm work in past three months; and (4) fluent in Spanish or English. Both female and male child farmworkers were eligible. The study had no exclusion criteria.

Interviewers developed lists of potential participants by working with community partners and through their own networks. When a potential participant was identified, the interviewer contacted the child's parents to explain the study, ensured the child met the inclusion criteria, discussed the monetary incentives for participation in the study, and obtained signed parental permission for the child's participation. The interviewer then spoke with the potential participant, again reviewing the study, inclusion criteria, and incentive, and obtained signed assent. Participants will be maintained in the study should they stop being employed in farm work. A few of the potential participants were "unaccompanied minors," individuals under age 18 years who do not live with a parent or legal guardian.[5,32] The Institutional Review Board approved recruiting these individuals without parental permission. Two-hundred two participants aged 10 to 17 years were recruited from May through November, 2017 (Table I). Participants resided in 20 NC counties (Figure 1). Because interviewers worked through community partners, the number of potential participants or their parents who refused to participate is not known.

2.3 Data collection

The survey interview questionnaire was developed to include measures needed to address the overall study specific aims. Items from existing questionnaires and scales (e.g., particularly those used by McCurdy et al.,[24] Arcury et al.,[42] and Kearney et al.[44]) were used whenever possible. The study's Professional and Youth Advisory Committees reviewed the questionnaire content, and the wording of specific items.[45] The English version of the questionnaire was translated to Spanish, and back-translated to ensure item accuracy. Both the English and Spanish versions were reviewed again by members of the Professional Advisory Committee. Pre-test interviews were conducted by study staff with members of the Youth Advisory Committee, as well as by the field interviewers with youth who had formerly worked in agriculture. Questionnaire item wording was adjusted based on feedback received during pretesting. The final interview questionnaire was designed to be completed within 45 minutes. Interviews were completed with tablets using REDCap (Research Electronic Data Capture), a secure web-based system, to record data.[46] Interviewers completed 172 interviews in English and 30 in Spanish.

Ten bilingual individuals with knowledge of their local farmworker communities from across NC recruited participants and conducted the interviews. All interviewers had experience with farmworkers through employment with organizations that provide services

to farmworkers. Each completed an intensive training program that included a didactic component that discussed recruitment procedures, procedures for obtaining parental permission and participant assent, the interview content, and using the tablet and REDCap. Interviewers completed CITI Research Ethics and Compliance Training (https://about.citiprogram.org/en/homepage/). Interviewers had to successfully complete an audio recorded or observed practice interview before they were certified to contact participants.

2.4 Measures

Five sets of participant measures are included in this analysis: (1) personal characteristics; (2) educational characteristics; (3) work characteristics; (4) wage characteristics; and (5) job characteristics. Personal characteristics included gender (female, male), age (in the categories 10–13 years, 14–15 years, and 16–17 years), race (white, black, American Indian, other), national origin (US, Mexico, Central American nation), speaks English (dichotomous), speaks Spanish (dichotomous), speaks an indigenous language (dichotomous), permanent residence (NC, Florida, other), years resided in NC (1, 2–10, 11–15, 16–17), and whether lived in NC entire life. Region of NC in which the participant lived at the time of the interview included East and West (Figure 1). Household characteristics included presence of parents, with the values of father and mother, mother only, father only, neither father nor mother. Other household characteristics included the three dichotomous measures of other relatives under 18 years of age in household, other relatives at least 18 years of age in household, and non-relatives in household.

Educational characteristics included currently enrolled in school (dichotomous), last grade completed (3–5, 6–8, 9–11, 12), and for those enrolled in school, school location (NC, another state, another nation). Participation in summer school, after school programs, summer camp, or migrant education were dichotomous measures. Among those currently enrolled in school, dichotomous measures of when they worked relative to school included worked during the previous fall semester, and whether they worked on a school day that semester; worked during the previous spring semester, and whether they worked on a school day that semester; worked during summer break; and worked on holidays. Whether they missed school due to work, whether they missed participating in summer programs due to work, or ever repeated a grade were dichotomous measures.

Work characteristics included whether the participant was a migrant worker (changed residence from another state to do farm work), and the years worked in agriculture (1, 2, 3, 4, 5 or more). Working with their father, mother, sibling, aunt or uncle, cousin, other relative, and worked with at least one relative when doing farm work were dichotomous. Number of weeks worked in the last three months had the values of 1–2, 3–4, 5–7, 8–11, 12; usual number of days worked per week was in the categories 1–2, 3–5, 6–7; hours worked in the last week worked was in the categories 3–20, 21–31, 32–40, 41–69.

Who received their pay (participant versus parent) was one wage characteristic measure, as well as whether they were ever paid by cash or ever paid by check. Piece rate was dichotomous; among those paid at piece rate, whether their actual work hours were recorded, and whether they were paid at least minimum wage were dichotomous. Other measures included being paid by the hour (dichotomous), and their hourly pay in dollars if

paid by the hour (less than $7.25, $7.25-$7.99, $8.00-$8.99, $9.00-$9.99, and $10.00 or greater). Measures of unpaid work time (time at work during which they could not work) were whether they traveled from field to field, and whether they were paid for that time; whether they waited for crops to dry, and whether they were paid for that time; and whether they waited for equipment repair, and whether they were paid for that time. Paid overtime is a measure of increased pay rate when they worked more than 40 hours per week.

For job characteristics, dichotomous measures for crops with which the participant worked in last week included tobacco, berries, tomatoes, sweet potatoes, green peppers, squash, hot peppers, cucumbers, melons, and other. Individuals could work with more than one crop in the last week. Dichotomous measures for tasks the participant performed in the last week worked included harvesting, topping tobacco, pulling weeds, loading, planting, driving a vehicle (other than a tractor), setting up sticks (for tomato plants), barning tobacco, driving a tractor, and irrigating. Individuals could perform more than one task in the past week.

2.5 Analysis

Descriptive statistics (count, percent) were calculated for personal, educational, work, wage, and job characteristics of interest. Associations between selected personal characteristics (age group, migrant status, region) and work and wage characteristics (work: works with relative, number of days worked per week; wage: child or parent paid, mode of pay) were examined using Chi-square or Fisher's exact tests as appropriate. Likewise, Chi-square or Fisher's exact tests were used to examine differences between the same three personal characteristics and selected job characteristics (crop: tobacco, berries, tomatoes, sweet potatoes; task: plant, cultivate/weed, harvest, top, and drive a vehicle). All analyses were performed using SAS version 9.4 (SAS Institute, Cary, NC) and p-values of less than .05 were considered statistically significant.

3 RESULTS

3.1 Personal Characteristics

Over one-third (37.6%) of the participants were female (Table II). Forty-three (21.3%) of the participants were aged 10–13 (four were aged 10, and four were aged 11), with most (47.0%) aged 16 or 17. All considered themselves to be Latinx. Most (55.9%) considered themselves to be white, with 41.6% considering themselves to be other. The large majority (81.2%) were born in the US, with 12.9% born in Mexico, and 5.9% born in a Central American country. The majority (84.2%) spoke English, all but one (99.5%) spoke Spanish, and 5.9% spoke an indigenous language.

Most (84.7%) of the participants were NC residents, with 13.4% being Florida residents. Most (77.7%) of the participants were living in eastern NC at the time they were interviewed. About one-third had lived in NC for 10 or fewer years, with 44.1% having lived in the state 11 to 15 years, and 22.8% having lived in the state 16 or 17 years. Over half (56.9%) had lived in NC their entire lives.

Most participants (59.9%) lived with both parents; 27.7% lived only with their mother, 3.5% lived only with their father, and 8.9% lived with no parent. Most had at least one minor co-

resident relative (80.2%) or older co-resident relative (54.0%) living with them. Thirty-six (17.8%) had non-relatives living in their houses. Of the 18 participants living with neither parent (unaccompanied minors), 9 were living with at least one relative under 18 years of age, 12 were living with at least one relative aged 18 years or older, and 9 were living with a non-relative.

3.2 Educational Characteristics

Most (95.1%) of the participants were currently enrolled in school (Table III). The last grade completed by a few (4.0%) was elementary school, with 35.1% last completing a middle school grade, 55.0% last completing a high school grade, and 5.9% having completed high school. Most were currently enrolled in a NC school (89.6%), with 16.2% enrolled in another state, and 2.6% enrolled in another nation. During the last school year, 27.6% of those currently enrolled in school attended a summer school program, 41.7% attended an after school program, 18.2% attended a summer camp, and 18.8% attended a Migrant Education program. During the last school year, 24.5% worked during the fall semester, 32.3% worked during the spring semester, 97.4% worked during summer break, and 22.4% worked during school holidays. Few (2 individuals) of those who worked during either Fall or Spring semesters worked during school hours, with 3.1% indicating that they missed school and 10.7% indicating they missed programs due to work.

3.3 Work Characteristics

Thirty-six (17.8%) of the participants were migrant workers (Table IV). About one-third (34.7%) had worked in agriculture for one year, with 18.3% having worked in agriculture for 4 or more years. The great majority (87.1%) of these child workers worked with a relative; commonly working with their father (24.3%), mother (44.6%), siblings (55.9%), aunt or uncle (28.7%), or cousins (38.1%). Some had worked little in the three months prior to their interview, with 19.8% having worked 1–2 weeks, and 35.2% 3–4 weeks; but 27.7% had worked 5–7 weeks, 11.4% had worked 8–11 weeks, and 5.9% had worked 12 weeks. They worked several days during the weeks they did work, with 56.4% working 3–5 days per week, and 30.2% working 6–7 days per week. Many also worked a large number of hours during the weeks they worked; about one-third (32.5%) worked 3–20 hours, but 17.5% worked 32–40 hours, and 34.0% worked 41–69 hours.

3.4 Wage Characteristics

Three-quarters (76.7%) of the participants were paid directly for their work, with the pay for 23.3% being given to their parents (Table V). Most were paid in cash (90.1%), while 18.8% were at some time paid by check. Of the 68 (33.7%) who ever worked piece-rate, 34 (50.0%) had their work hours recorded and 29 (85.3%) of these (42.6% of those working piece rate) were paid minimum wage. Of the 68.8% of those who ever worked for an hourly rate, most (96.4%) were paid minimum wage ($7.25 per hour) or greater. Of those paid by the hour (n=139), 110 (79.1%) traveled from field to field but 86 were paid for this time; 27 (19.4%) waited for crops to dry but 14 were paid for this time; and 22 (15.8%) waited for equipment to be repaired but 16 were paid for this time. Of the 139 paid by the hour, 71 (51.1%) worked more than 40 hours per week, with 9 receiving over-time pay.

3.5 Job Characteristics

Most (57.4%) of these child workers had worked in tobacco in the last week they worked before their interview (Table VI). Other common crops in which they worked in the previous week were berries (25.7%), tomatoes (16.3%), and sweet potatoes (14.4%). The most common tasks in the previous week were harvesting (50%) and topping tobacco (50%). Other common tasks were pulling weeds (41.1%), loading (27.2%), and planting (14.9%). A small number of child workers drove a vehicle (7.4%) or a tractor (3.0%).

3.6 Associations of Selected Personal Characteristics with Selected Work, Wage, and Job Characteristics

Migrant farmworker status was significantly associated with speaking English; 69% of migrant farmworkers workers spoke English versus 87% of seasonal farmworkers ($p = 0.008$). Migrant farmworker status was significantly associated with country of origin; 69% of migrant farmworkers were born in the US versus 84% of seasonal farmworkers being born in the US ($p = 0.047$). Speaking English was significantly associated with country of origin; 92% of those born in the US spoke English versus 50% of those not born in the US ($p < .0001$). Region of the state differentiated the child workers: 32 (71.1%) of those in the West were migrants, while 4 (2.6%) of those in the East were migrants ($p < .0001$). We selected work, wage, and job characteristics based on their variability and statistical independence. We do not report associations of gender with these characteristics because gender had a significant association with only one characteristic; a smaller percentage of girls (6.6%) than boys (19.1%) worked in sweet potatoes ($p = .014$).

Although the majority of all child farmworkers worked with at least one relative, more of those aged 10 to 13 years (97.7%) versus those aged 14 or 15 years (90.6%) and aged 16 or 17 years (80.0%) worked with a relative (Table VII). Most of the child farmworkers worked 3 to 5 days per week; fewer of those aged 10 to 13 years (11.6%) worked 6 or 7 days per week versus those aged 14 or 15 years (29.7%) and aged 16 or 17 (38.9%). Fewer of those aged 10 to 13 (41.9%) received their pay directly (versus having their parents receive their pay) versus those aged 14 or 15 (76.6%) and 16 or 17 (92.6%). Being paid in cash or by check, and working piece rate did not vary by age.

The great majority of migrant (94.4%) and seasonal (85.5%) child farmworkers worked with at least one relative. Many more migrant child farmworkers (61.1%) versus seasonal child farmworker (23.5%) worked 6 or 7 days per week. Fewer migrant child farmworkers (52.8%) versus seasonal child farmworkers (81.9%) were paid directly. Compared to seasonal child farmworkers, fewer migrant child farmworkers were paid in cash (69.4% versus 94.6%), more were paid by check (50.0% versus 12.1%), and more worked at piece rate (63.9% versus 27.1%).

Regional comparisons indicated the same pattern as did the migrant status comparison. Most child farmworkers in the West (93.3%) and East (85.4%) worked with at least one relative. More of those in the West (44.4%) than in the East (26.1%) work 6 or 7 days per week, although this difference in not statistically significant. Fewer child farmworkers in the West (55.6%) than in the East (82.8%) were paid directly. Compared to child farmworkers in the

East, fewer child farmworkers in the West were paid in cash (68.9% versus 96.2%), more were paid by check (46.7% versus 10.8%), and more worked at piece rate (62.2% versus 25.5%).

Fewer of those aged 10 to 13 worked in tobacco (32.6%) than those aged 14 or 15 (64.1%), or 16 to 17 (64.2%) (Table VIII). Fewer younger child farmworkers planted or cultivated any crop, or topped tobacco than did older child farmworkers. More of the younger child farmworkers harvested any crop than did older child farmworkers. Fewer migrant child farmworkers (11.1%) than seasonal child farmworkers (67.5%) worked in tobacco, but more migrant child farmworkers (83.3%) than seasonal child farmworkers (1.8%) worked in tomatoes. Fewer migrant child workers (2.8%) worked in sweet potatoes than did seasonal child farmworkers (16.9%). Compared with seasonal child farmworkers, fewer migrant child farmworkers cultivated any crop (19.4% versus 45.8%) and topped tobacco (8.3% versus 59.0%), but more harvested (77.8% versus 44.0%) and drove vehicles (27.8% versus 4.8%). Similarly, region of the state differentiated the child workers. Two (4.4%) of those in the West worked in tobacco, while 72.6% of those in the East had worked in tobacco; 71.1% of those in the West worked in tomatoes, while 0.6% of those in the East had worked in tomatoes; none of those in the West had worked in sweet potatoes, while 18.5% of those in the East had worked in sweet potatoes. Compared with child farmworkers in the East, fewer child farmworkers in the West cultivated any crop (20.0% versus 47.1%) and topped tobacco (4.4% versus 63.1%), but more harvested any crop (86.7% versus 39.5%) and drove (24.4% versus 4.5%).

4 DISCUSSION

This paper provides an overview of the research design we are using for a large, multicomponent study to document the work experiences of hired Latinx child farmworkers and to determine the associations of these work experiences with their health and developmental outcomes. It also provides a summary of the personal, educational, and occupational characteristics of the hired Latinx child farmworkers participating in this research. The community-based participatory framework[47] for this research ensures involvement by those providing services and advocating for child farmworkers, as well as those who were child farmworkers. This increases the likelihood that the research results will address the needs of child workers, advocates, and health and education providers.

The characteristics of the child farmworkers who participated in this study reflect those reported in earlier surveys conducted in NC among 10–17 year olds,[42] and among 14–18 year old farmworkers in Texas[39] and in Washington.[33] Most (about 80%) were born in the US, and they tend to be long term residents of the state in which they were interviewed. This differs from the California youth in the MICASA project,[36] 55.5% of whom were born in the US. English language use varied regionally; 84.2% of our participants spoke English and preferred being interviewed in English, while about 70% of the Washington[33] and California[36] participants preferred English. Among Texas child farmworkers, 18.1% preferred English and 38.5% equally preferred English or Spanish.[39]

The percent of girls employed as farmworkers was similar across studies. In our study, 37.6% of our participants were girls. In Texas, 40.7% of participants were girls[39] and in Washington, 39.3% of participants were girls.[33] In California, 37.6% of all participants were girls, with 28.6% of those who were employed as farmworkers in the past 12 months being girls.[36] McCurdy and Kwan's[26] analysis of Hispanic high school student agriculture workers differs from other studies, with only 17 of 212 (8%) of these students being girls. Our analysis found that gender was not related to any work characteristics that we examined; McCurdy and Kwan[25] reported a median of 624 hours per year worked by Hispanic boys, and of 189 hours per year for Hispanic girls. Our future analyses will examine potential gender differences in work experiences, including sexual harassment, and developmental and psychological outcomes.

Most of the child participants lived and worked with family members, as was the case with child farmworkers participating in other studies.[25,33,36,39] At the same time, almost 1-in-10 (8.9%) of the children participating in our study lived with neither parent, although most of these individuals lived with another relative. These 18 participants were unaccompanied minors.[5,32]

Unlike the studies conducted by Shipp et al.[39] and McCurdy and Kwan,[25] this study did not recruit participants through migrant education programs or general high school classes. Still, like the participants in the study by Hennessy-Burt et al.,[36] most of our participants were enrolled in school. Further analysis will consider changes in enrollment and educational success among those who continue in farm work. For example, 30.2% of the participants report having repeated a grade; this compares to 7% of US children, and 10% of NC children aged 6 to 17 who for 2015–16 had repeated a grade.[48]

Thirty-six (17.8%) of the child farmworkers participating in this study were migrant workers; they changed residence for agricultural employment. Many of these migrant child farmworkers stated that their permanent residence was in Florida. Shipp et al.[38] indicates that over 75% of their Texas child farmworkers were involved in migrant farm work for one or more years (with migrant farm work defined as spending at least one night away from the usual home to work). Other research with child farmworkers did not report migrant work status; this may result from their recruiting participants from schools[25] or from single locales with the potential for year round agricultural employment.[33,36] Migration increases the vulnerability of child farmworkers, particularly when they are unaccompanied.[32] All migrant child farmworkers experience repeated changes in school and health care providers; those who are unaccompanied may lack social support and experience the stresses of economic independence.[5]

It is difficult to compare the amount of work (days per week, hours per day) of NC child farmworkers with that of child farmworkers in other states due to variation in agricultural systems. The NC child farmworkers varied in the number of weeks worked in the past three months. This may be a reflection of when they were interviewed; those interviewed in June may not have had as much opportunity to work as those interviewed in August or September. Also, the number of weeks they worked may reflect when specific work tasks were needed; for example, harvesting tomatoes in the West, and topping tobacco in the East.

Hennessy-Burke et al.[36] reported that 40% of their participants worked 4 or fewer weeks; we found that 55% of our participants had worked 4 or fewer weeks when interviewed. We found that most of our participants worked three or more days per week, with almost one-third working 6 or 7 days per week. Most worked 32 or more hours per week, with one-third having worked more than 40 hours per week. McCurdy and Kwan[25] reported that Hispanic boys worked a median of 624 hours per year, and Hispanic girls worked a median of 189 hours per year.

One-third of the NC child farmworkers reported working piece rate, for which they were paid for the amount of crop harvested, rather than by the hour. Piece rate leads workers to work faster, take fewer breaks, and ignore safety in order to maximize income, and has been associated with increased injury.[49]

NC child farmworkers, like those in California[25] and Texas,[39] work at a variety of tasks and crops. The agriculture of each region differs, so crop comparisons are difficult. For example, about 15% of Texas child farmworkers harvested melons,[38] while 2.5% of the NC child farmworkers harvested melons. Contrary to denials from the tobacco industry,[50] many children in the 10–13 year and 14–15 year age groups reported working in tobacco. Far fewer of the NC child farmworkers drove or operated machinery or mixed or applied chemicals than did those in California.[25]

Two ideal types[51] for NC child farmworkers emerge from the data, one for the West and one for the East regions. These ideal types provide insight into important differences among hired child farmworkers, and needed differences in approaching problems experienced by these children. Child farmworkers in the West are more likely to be migrant and foreign born. They often work 6 or 7 days each week. Most work piece rate, with a substantial number having their pay given to a parent. Almost half are paid by check. About a quarter drive equipment at work. This profile indicates that they are at greater risk for school disruptions, and subject to more immigration problems. They are also at greater risk for occupational injuries due to their extensive work schedules, working piece rate, and to their driving farm equipment. Their pay going to a parent increases the risk of exploitation by their supervisors shorting the combined remuneration by manipulating the total hours worked or the pay rate.

Child farmworkers in the East are generally seasonal (they work in the area in which they live, and do not migrate for work), born in the US (making them citizens), and speak English (as well as Spanish). Most work 5 or fewer days per week. Overwhelmingly, they are paid in cash. They work in tobacco, often topping this crop. They seldom drive vehicles. These child farmworkers are at risk for few school disruptions. However, they are at risk for wage theft by their employers.[52] A majority work in tobacco, putting them at risk for tobacco-related occupational injury and illnesses, such as nicotine poisoning (green tobacco sickness).[53] Almost one-in-five work in harvest sweet potatoes, putting them at risk for substantial musculoskeletal disorder and pain.[54]

Despite the size and wide geographic reach of the sample, the current and extensive data, and repeated measures design of this study, it remains limited in several ways. Foremost is

the nature of the sample design. The number and location of child farmworkers across NC is not known, and limiting the sample to schools would not be efficient and would exclude migrant child farmworkers. Therefore, although the sample is not random, being based on the organizations that serve this population may make it more representative than a school-based sample. The response rate cannot be determined. However, comparison to other studies of child farmworkers provides some external validity for our sample. Other limitations, similar to other existing studies, are the focus on Latinx child farmworkers and to one state, limiting the generalizability of the results.

4.1 Conclusions

This research study has enrolled a large and diverse sample of NC child farmworkers. These child farmworkers are similar to those recruited for studies in Washington, California, and Texas. The data collected by the NC study expands examination of some participant characteristics, and, with the longitudinal data collection, will allow analysis of how this work affects child health and development.

This introduction to the study design and participant characteristics indicates several important issues for further analysis. These include the effect of migration on educational disruption and occupational injuries, the association of piece rate with occupational injuries, and the effects of tobacco work on child health. Ongoing analyses of these data will address these and other questions. In addition, the results of this study will be made available to policy makers to ensure that they are aware of the potential negative outcomes of paid child farm labor.[55]

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REFERENCES

1. Lee BC, Gallagher SS, Liebman AK, Miller ME, Marlenga B. Developing the 2012 national action plan for protecting children in agriculture. J Agromedicine. 2012;17:88–93. [PubMed: 22490023]
2. Marlenga B, Berg RL, Linneman JG, Brison RJ, Pickett W. Changing the child labor laws for agriculture: impact on injury. Am J Public Health. 2007; 97: 276–282 [PubMed: 17194860]
3. Miller ME. Historical background of the child labor regulations: strengths and limitations of the agricultural hazardous occupations orders. J Agromedicine. 2012;17:163–185. [PubMed: 22490029]
4. Wiggins M Farm labor and the struggle for justice in the eastern United States fields. In: Arcury TA, Quandt SA, eds. Latino Farmworkers in the Eastern United States: Health, Safety, and Justice. New York: Springer; 2009: Pp. 201–220.
5. McLaurin JA, Liebman AK. Unique agricultural safety and health issues of migrant and immigrant children. J Agromedicine. 2012;17:86–196.
6. US Department of Labor, Wage and Hour Division. Child Labor Bulletin 102. Child labor requirements in agricultural occupations under the Fair Labor Standards Act. WH1295 Washington,

DC: US Department of Labor, 2016 https://www.dol.gov/whd/regs/compliance/childlabor102.pdf. Accessed May 30, 2018].

7. National Institute for Occupational Safety and Health. Agricultural Safety. 2018 https://www.cdc.gov/niosh/topics/aginjury/. Accessed July 3, 2018.
8. Goldcamp M, Hendricks KJ, Myers JR. Farm fatalities to youth 1995–2000: A comparison by age groups. J Safety Res. 2004;35:151–157. [PubMed: 15178233]
9. Hard DL, Myers JR. Fatal work-related injuries in the agriculture production sector among youth in the United States, 1992–2002. J Agromedicine. 2006;11:57–65. [PubMed: 17135143]
10. National Children's Center for Rural and Agricultural Health and Safety. 2017 Fact Sheet: Childhood Agricultural Injuries in the U.S. 2018 http://www.marshfieldresearch.org/nccrahs. Accessed July 3, 2018.
11. Zaloshnja E, Miller TR, Lawrence B. Incidence and cost of injury among youth in agricultural settings, United States, 2001–2006. Pediatrics. 2012;129:728–734. [PubMed: 22412022]
12. Allread WG, Wilkins JR 3rd, Waters TR, Marras WS. Physical demands and low-back injury risk among children and adolescents working on farms. J Agric Saf Health. 2004;10:257–274. [PubMed: 15603225]
13. Bartels S, Niederman B, Waters TR. Job hazards for musculoskeletal disorders for youth working on farms. J Agric Saf Health. 2000; 6:191–201. [PubMed: 11202113]
14. Bonauto DK, Keifer M, Rivara FP, Alexander BH. A community-based telephone survey of work and injuries in teenage agricultural workers. J Agric Saf Health. 2003;9:303–317. [PubMed: 14679878]
15. Chapman LJ, Newenhouse AC, Meyer RH, Karsh BT, Taveira AD, Miquelon MG. Musculoskeletal discomfort, injuries, and tasks accomplished by children and adolescents in Wisconsin fresh market vegetable production. J Agric Saf Health. 2003; 9:91–105. [PubMed: 12827856]
16. Darragh AR, Stallones L, Sample PL, Sweitzer K. Perceptions of farm hazards and personal safety behavior among adolescent farmworkers. J Agric Saf Health. 1998; Special Issue (1): 159–169.
17. Lander LI, Rudnick SN, Perry MJ. Assessing noise exposures in farm youths. J Agromedicine. 2007;12(2):25–32.
18. Lee BC, Jenkins LS, Westaby JD. Factors influencing exposure of children to major hazards on family farms. J Rural Health. 1997;13:206–215. [PubMed: 10174611]
19. Marlenga B, Pickett W, Berg RL. Agricultural work activities reported for children and youth on 498 North American farms. J Agric Saf Health. 2001; 7:241–252. [PubMed: 11787753]
20. Mason C, Earle-Richardson G. New York State child agricultural injuries: how often is maturity a potential contributing factor? Am J Ind Med. 2002;Suppl 2:36–42. [PubMed: 12210680]
21. Neufeld S, Wright SM, Gaut J. Not raising a "bubble kid": farm parents' attitudes and practices regarding the employment, training and supervision of their children. J Rural Health. 2002; 18:57–66. [PubMed: 12043756]
22. Schulman MD, Evensen CT, Runyan CW, Cohen LR, Dunn KA. Farm work is dangerous for teens: Agricultural hazards and injuries among North Carolina teens. J Rural Health. 1997; 13:295–305. [PubMed: 10177151]
23. Westaby JD, Lee BC. Antecedents of injury among youth in agricultural settings: a longitudinal examination of safety consciousness, dangerous risk taking, and safety knowledge. J Saf Res. 2003; 34:227–240.
24. McCurdy SA, Xiao H, Kwan JA. Agricultural injury among rural California public high school students. Am J Ind Med. 2012; 55:63–75. [PubMed: 21882215]
25. McCurdy SA, Kwan JA. Agricultural injury risk among rural California public high school students: prospective results. Am J Ind Med. 2012a; 55: 631–642. [PubMed: 22069123]
26. McCurdy SA, Kwan JA. Ethnic and gender differences in farm tasks and safety practices among rural California farm youth. J Occup Environ Hyg. 2012b; 9:362–370. [PubMed: 22554116]
27. Gorucu S, Murphy D, Kassab C. Occupational and nonoccupational farm fatalities among youth for 2000 through 2012 in Pennsylvania. J Agromedicine. 2015;20:125–39. [PubMed: 25906271]
28. Jinnah HA, Stoneman Z. Influence of permissive parenting on youth farm risk behaviors. J Agromedicine. 2016;21:244–252. [PubMed: 27135252]

29. Summers P, Quandt SA, Spears Johnson CR, Arcury TA. Child work safety on the farms of local agricultural market producers: Parent and child perspectives. J Agromedicine. 2018;23:52–59. [PubMed: 28976287]
30. Kim K, Beach J, Senthilselvan A, et al. Agricultural injuries among farm and non-farm children and adolescents in Alberta, Canada. Am J Ind Med. 2018 7 12. doi: 10.1002/ajim.22872. [Epub ahead of print].
31. Gabbard S, Georges A, Hernandez T, Sum C, Carroll D. Findings from the National Agricultural Workers Survey (NAWS) 2000–2009: Profiles of Youth, Parents, and Children of Farm Workers in the United States Research Report 10. Washington, DC: US Department of Labor, Employment and Training Administration, Office of Policy Development and Research, 2014.
32. Peoples JD, Bishop J, Barrera B, et al. Health, occupational and environmental risks of emancipated migrant farmworker youth. J Health Care Poor Underserved. 2010;21:1215–1226. [PubMed: 21099073]
33. Perla ME, Iman E, Campos L, et al. Agricultural occupational health and safety perspectives among Latino-American youth. J Agromedicine. 2015;20(2):167–77. [PubMed: 25906275]
34. McCauley LA, Sticker D, Bryan C, Lasarev MR, Scherer JA. Pesticide knowledge and risk perception among adolescent Latino farmworkers. J Agric Saf Health. 2002; 8:397–409. [PubMed: 12549244]
35. Salazar MK, Napolitano M, Scherer JA, McCauley LA. Hispanic adolescent farmworkers' perceptions associated with pesticide exposure. West J Nurs Res. 2004;26:146–166. [PubMed: 15005979]
36. Hennessy-Burt TE, Stoecklin-Marois MT, McCurdy SA, Schenker MB. Factors associated with agricultural work performed by adolescents from an immigrant farm worker population (MICASA study). J Agric Saf Health. 2013;19:163–173. [PubMed: 24400421]
37. Shipp EM, Cooper SP, del Junco DJ, Bolin JN, Whitworth RE, Cooper CJ. Pesticide safety training among farmworker adolescents from Starr County, Texas. J Agric Saf Health. 2007a; 13:311–321. [PubMed: 17892073]
38. Shipp EM, Cooper SP, Del Junco DJ, Delclos GL, Burau KD, Tortolero SR. Severe back pain among farmworker high school students from Starr County, Texas: Baseline results. Ann Epidemiol. 2007b;17:132–141. [PubMed: 17027295]
39. Shipp EM, Cooper SP, del Junco DJ, Cooper CJ, Whitworth RE. Acute occupational injury among adolescent farmworkers from South Texas. Inj Prev. 2013;19:264–270. [PubMed: 23143346]
40. Whitworth KW, Shipp EM, Cooper SP, Del Junco DJ. A pilot study of symptoms of neurotoxicity and injury among adolescent farmworkers in Starr County, Texas. Int J Occup Environ Health. 2010;16:138–144. [PubMed: 20465058]
41. Spears CR, Kraemer Diaz AE, Bailey M, King K, Arcury TA. Empowering Latino youth farmworkers as youth health educators for occupational heat-related illness safety education in Eastern North Carolina. Practicing Anthropology 2013; 35:38–43.
42. Arcury TA, Rodriguez G, Kearney GD, Arcury JT, Quandt SA. Safety and injury characteristics of youth farmworkers in North Carolina: A pilot study. J Agromedicine. 2014;19:354–363. [PubMed: 25275401]
43. Arcury TA, Kearney GD, Rodriguez G, Arcury JT, Quandt SA. Work safety culture of youth farmworkers in North Carolina: A pilot study. Am J Public Health. 2015;105:344–350. [PubMed: 25521896]
44. Kearney GD, Rodriguez G, Arcury JT, Quandt SA, Arcury TA. Work safety climate, safety behaviors, and occupational injuries of youth farmworkers in North Carolina. Am J Public Health. 2015;105:1336–1343. [PubMed: 25973817]
45. Arnold TJ, Malki A, Leyba J, Ibarra J, Daniel SS, Ballard PJ, Sandberg JC, Quandt SA, Arcury TA. Engaging Youth Advocates in Community Based Participatory Research on Child Farmworker Health in North Carolina. Prog Community Health Partners. In press.
46. Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap) - A metadata-driven methodology and workflow process for providing translational informatics support. J Biomed Inform. 2009;42:377–381. [PubMed: 18929686]

47. Arcury TA, Quandt SA. Community-based participatory research and occupational health disparities: pesticide exposure among immigrant farmworkers In: Leong FTL, Eggerth DE, Chang DH, Flynn MA, Ford, Martinez RO, eds. Occupational Health Disparities: Improving the Well-Being of Ethnic and Racial Minority Workers. Washington, DC: APA Press; 2017:89–112.

48. Annie E Casey Foundation Kids Count Data Center. Children ages 6 to 17 who repeated one or more grades since starting kindergarten. https://datacenter.kidscount.org/data/tables/9713-children-ages-6-to-17-who-repeated-one-or-more-grades-since-starting-kindergarten?loc=1&loct=2#detailed/2/2-52/true/1539/any/18958,18959. Accessed July 23, 2018.

49. Johansson B, Rask K, Stenberg M. Piece rates and their effects on health and safety - a literature review. Appl Ergon. 2010;41:607–614. [PubMed: 20106469]

50. Wurth M, Buchanan J. Human Rights Watch. Teens of the Tobacco Fields: Child Labor in United States Tobacco Farming. Human Rights Watch 2015 https://www.hrw.org/report/2015/12/09/teens-tobacco-fields/child-labor-united-states-tobacco-farming. Accessed July 23,2018.

51. Weber M Objectivity in social science and social policy IN Shils EA, Finch HA, eds. and trans. The Methodology of the Social Sciences,E New York: Free Press; 1904/1949:49–112.

52. Robinson EN, Nguyen HT, Isom S, Quandt SA, Grzywacz JG, Arcury TA. Wages, wage violations, and pesticide safety experienced by migrant farmworkers in North Carolina. New Solut. 2011;21:251–268, 2011. [PubMed: 21733804]

53. Arcury TA, Quandt SA. Health and social impacts of tobacco production. J Agromedicine. 2006;11:71–81. [PubMed: 19274899]

54. Kearney GD, Allen DL, Balanay JA, Barry P. A descriptive study of body pain and work-related musculoskeletal disorders among Latino farmworkers working on sweet potato farms in eastern North Carolina. J Agromedicine. 2016;21:234–243. [PubMed: 27081751]

55. Arcury TA, Wiggins MF, Brooke C, et al. Using “policy briefs” to present scientific results of CBPR: Farmworkers in North Carolina. Prog Community Health Partnersh. 2017;11:137–147. [PubMed: 28736406]

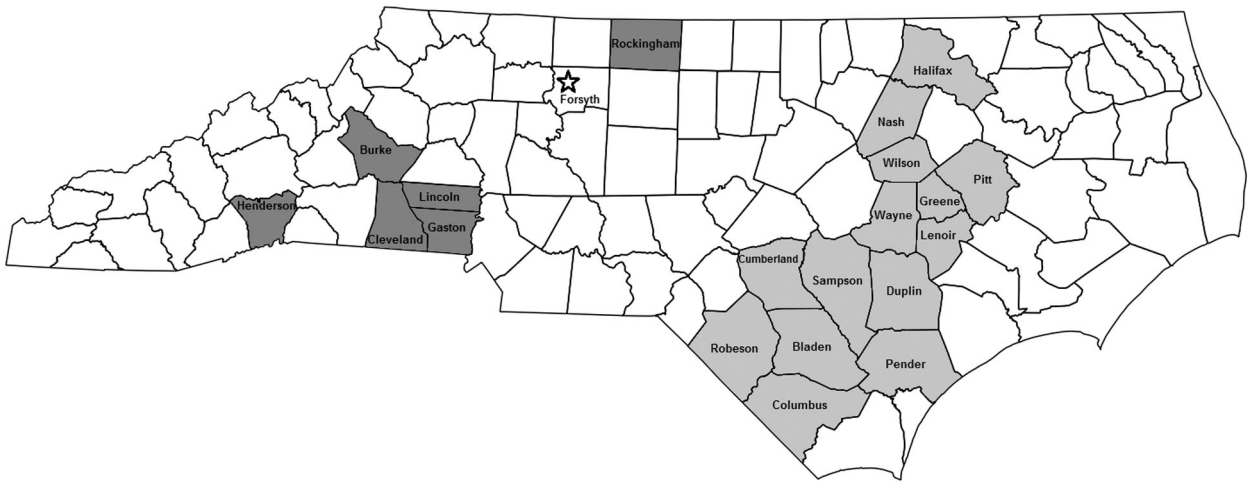

Figure 1.

Map of North Carolina showing location of Wake Forest School of Medicine (star), East counties in which participants were interviewed (light gray), and West counties in which participants were interviewed (dark gray).

Table I:

Participant Recruitment by Month, Latinx Child Farmworkers in North Carolina, 2017 (N=202).

Month	n	%
May	9	4.5
June	19	9.4
July	63	31.2
August	35	17.3
September	31	15.4
October	33	16.3
November	12	5.9

Table II:

Participant Personal Characteristics, Latinx Child Farmworkers in North Carolina, 2017 (N=202).

Personal Characteristics	n	%
Gender		
Female	76	37.6
Male	126	62.4
Age (in years)		
10–13	43	21.3
14–15	64	31.7
16–17	95	47.0
Race		
White	113	55.9
Black	2	1.0
American Indian	3	1.5
Other	84	41.6
National origin		
United States	164	81.2
Mexico	26	12.9
Central American nation	12	5.9
Speaks English	170	84.2
Speaks Spanish	201	99.5
Speaks indigenous language	12	5.9
Permanent residence		
North Carolina	171	84.7
Florida	27	13.4
Other	4	2.0
Region of North Carolina		
East	157	77.7
West	45	22.3
Years resided in North Carolina		
1	41	20.3
2–10	26	12.9
11–15	89	44.1
16–17	46	22.8
Lived entire life in North Carolina	115	56.9
Household parental presence		
Mother and father	121	59.9
Mother only	56	27.7
Father only	7	3.5
Neither father nor mother	18	8.9
Other relatives under 18 in household	162	80.2
Other relatives at least 18 in household	109	54.0

Personal Characteristics	n	%
Non-relatives in household	36	17.8

Table III:

Participant Educational Characteristics, Latinx Child Farmworkers in North Carolina, 2017 (N=202).

Educational Characteristics	n	%
Currently enrolled in school	192	95.1
Last grade completed		
3–5 (elementary school)	8	4.0
6–8 (middle school)	71	35.1
9–11 (high school)	111	55.0
12 (high school graduate)	12	5.9
School location (for those enrolled in school)		
North Carolina	172	89.6
Another state	31	16.2
Another nation	5	2.6
Programs attended (for those enrolled in school)		
Summer school	53	27.6
After school program	80	41.7
Summer camp/program	35	18.2
Migrant education	36	18.8
Work and school (for those enrolled in school)		
Worked during fall semester when school was in session	47	24.5
Worked on school day (for those working during fall semester)	2	4.3
Worked during spring semester when school was in session	62	32.3
Worked on school day (for those working during spring semester)	0	
Worked during summer break	187	97.4
Worked during school holidays	43	22.4
Missed school due to work (for those enrolled in school)	6	3.1
Missed programs due to work (for those enrolled in at least one program, n =112)	12	10.7
Repeated a grade	61	30.2

Table IV:

Participant Work Characteristics, Latinx Child Farmworkers in North Carolina, 2017 (N=202).

Work Characteristics	n	%
Migrant worker	36	17.8
Years worked in agriculture		
1	70	34.7
2	53	26.2
3	42	20.8
4	18	8.9
5 or more	19	9.4
Work with at least one relative	176	87.1
Family co-workers		
Father	49	24.3
Mother	90	44.6
Siblings	113	55.9
Aunt or uncle	58	28.7
Cousins	77	38.1
Other relative	18	8.9
Weeks worked in last 3 months		
1–2 weeks	40	19.8
3–4 weeks	71	35.2
5–7 weeks	56	27.7
8–11 weeks	23	11.4
12 weeks	12	5.9
Days worked per week		
1–2 days	27	13.4
3–5 days	114	56.4
6–7 days	61	30.2
Hours worked in the last week worked *		
3–20 hours	65	32.5
21–31 hours	32	16.0
32–40 hours	35	17.5
41–69 hours	68	34.0

* Missing values

Table V.

Participant Wage Characteristics, Latinx Child Farmworkers in North Carolina, 2017 (N=202).

Wage and Benefit Characteristics	n	%
Who received pay		
Self	155	76.7
Parents	47	23.3
Pay		
Ever cash	182	90.1
Ever check	38	18.8
Piece rate	68	33.7
Hours worked recorded (for those paid piece rate)	34	50.0
Paid minimum wage (for those with hours recorded)	29	85.3
Paid by hour	139	68.8
Hourly pay in dollars (for those paid by the hour) *		
Less than 7.25	5	3.6
7.25 – 7.99	9	6.6
8.00–8.99	76	55.5
9.00–9.99	42	30.7
10.00 or greater	5	3.6
Unpaid work time (for those paid by the hour)		
Traveled field to field	110	79.1
Paid	86	78.2
Waited for crops to dry	27	19.4
Paid	14	51.9
Waited for equipment repair	22	15.8
Paid	16	72.7
Worked more than 40 hours per week (for those paid by the hour)	71	51.1
Paid overtime	9	12.7

* Missing values

Table VI.

Participant Job Characteristics, Latinx Child Farmworkers in North Carolina, 2017 (N=202).

Job Characteristics	n	%
Crops worked in past week		
Tobacco	116	57.4
Berries	52	25.7
Tomatoes	33	16.3
Sweet potatoes	29	14.4
Green peppers	13	6.4
Squash	8	4.0
Hot peppers	7	3.5
Cucumbers	6	3.0
Melons	5	2.5
Other	21	10.4
Tasks in past week		
Harvesting or picking	101	50.0
Topping tobacco	101	50.0
Pulling weeds or cultivating	83	41.1
Loading	55	27.2
Planting	30	14.9
Driving vehicle (other than a tractor)	15	7.4
Setting up sticks	14	6.9
Barning tobacco	8	4.0
Driving tractor	6	3.0
Irrigating	5	2.5

Table VII.

Association of Selected Work, and Wage and Benefit Characteristics with Personal Characteristics, Latinx Child Farmworkers in North Carolina, 2017 (N=202).

Personal Characteristics	Works with at Least One Relative	Days Worked Per Week			Child Farmworker (vs. Parent) Receives Pay	Paid in Cash	Paid by Check	Works Piece Rate
		2 or fewer	3–5	6–7				
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Age (in years)								
10–13	42 (97.7)**	13 (30.2)	25 (58.1)	5 (11.6)***	18 (41.9)***	39 (90.7)	9 (20.9)	20 (46.5)
14–15	58 (90.6)	9 (14.1)	36 (56.2)	19 (29.7)	49 (76.6)	58 (90.6)	14 (21.9)	21 (32.8)
16–17	76 (80.0)	5 (5.3)	53 (55.8)	37 (38.9)	88 (92.6)	85 (89.5)	15 (15.8)	27 (28.4)
Migrant status								
Migrant	34 (94.4)	3 (8.3)	11 (30.6)	22 (61.1)***	19 (52.8)***	25 (69.4)***	18 (50.0)***	23 (63.9)***
Seasonal	142 (85.5)	24 (14.5)	103 (62.0)	39 (23.5)	136 (81.9)	157 (94.6)	20 (12.1)	45 (27.1)
Region								
West	42 (93.3)	6 (13.3)	19 (42.2)	20 (44.4)†	25 (55.6)***	31 (68.9)***	21 (46.7)***	28 (62.2)***
East	134 (85.4)	21 (13.4)	95 (60.5)	41 (26.1)	130 (82.8)	151 (96.2)	17 (10.8)	40 (25.5)

† p<.10

* p<.05

** p<.01

*** p<.001

Table VIII.

Association of Selected Job Characteristics with Personal Characteristics, Latinx Child Farmworkers in North Carolina, 2017 (N=202).

	Crop					Task			
Personal Characteristics	**Tobacco**	**Berries**	**Tomatoes**	**Sweet Potatoes**	**Plant**	**Cultivate / Weed**	**Harvest**	**Top Tobacco**	**Drive**
	n (%)	**n (%)**	**n (%)**	**n (%)**	**n (%)**	**n (%)**	**n (%)**	**n (%)**	**n (%)**
Age (in years)									
10–13	14 (32.6)***	16 (37.2)	9 (20.9)	3 (7.0)	4 (9.3)*	10 (23.3)**	27 (62.8)†	13 (30.2)*	2 (4.7)†
14–15	41 (64.1)	15 (23.4)	8 (12.5)	9 (14.1)	5 (7.8)	22 (34.4)	33 (51.6)	36 (56.3)	3 (4.7)
16–17	61 (64.2)	21 (22.1)	16 (16.8)	17 (17.9)	21 (22.1)	51 (53.7)	41 (43.2)	52 (54.7)	13 (13.7)
Migrant status									
Migrant	4 (11.1)***	5 (13.9)†	30 (83.3)***	1 (2.8)*	6 (16.7)	7 (19.4)**	28 (77.8)***	3 (8.3)***	10 (27.8)***
Seasonal	112 (67.5)	47 (28.3)	3 (1.8)	28 (16.9)	24 (14.5)	76 (45.8)	73 (44.0)	98 (59.0)	8 (4.8)
Region									
West	2 (4.4)***	11 (24.4)	32 (71.1)***	0**	7 (15.6)	9 (20.0)**	39 (86.7)***	2 (4.4)***	11 (24.4)***
East	114 (72.6)	41 (26.1)	1 (0.6)	29 (18.5)	23 (14.7)	74 (47.1)	62 (39.5)	99 (63.1)	7 (4.5)

† p<.10

* p<.05

** p<.01

*** p<.001