Nontraditional Work Factors in Farmworker Adolescent Populations: Implications for Health Research and Interventions

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SYNOPSIS

Agriculture has been documented to be one of the most hazardous work environments for both adults and children. Adolescents may be especially vulnerable to adverse health effects from agricultural exposures due to the rapid growth and development experienced during those years. Separating the occupational, economic, and social issues in this population is difficult. Weak regulatory protection, lack of compliance with existing regulations, and gaps in service provision characterize the working conditions of adolescent farmworkers. Although there is increasing research on the impact of work organization on mental and physical health in adult working populations, there is a scarcity of research focused on this concept in young workers—and it remains virtually unaddressed in young farmworkers.

Work characteristics of the informal work sector, better delineated in international literature, should be considered when planning research or interventions in this at-risk population. Further, the population of adolescent farmworkers is diverse, and research strategies and interventions need to be targeted and tailored to the heterogeneous groups. This article addresses some of the nontraditional work factors associated with the less-than-formal work organization and environments in the farmworker adolescent population and how these factors may inform the planning of research and interventions. Specifically, mobility, cultural patterns and social networks, alternative sampling strategies, alternative delivery of health care and education, and involvement of a wide range of players in the work environment of adolescent farmworkers should all be considered when conducting research or planning programs for this population.

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Studies focusing on the working circumstances and health risks of adolescent farmworkers are sparse and often supplemental to general farmworker studies,[1] yet identifying the distinct work patterns and physical, social, and organizational environments is critical to defining the problem. Furthermore, initiating traditional prevention activities and routine safety training may not be effective in this population.[1] Although descriptive data have been presented about (*1*) adolescent farmworkers overall,[2,3] (*2*) the unique risks and recommendations for needed interventions,[4] and (*3*) specific issues such as adverse educational impacts,[5] pesticide knowledge and risk perception,[6] and musculoskeletal disorders,[7] there is no consideration of the international relevance and benefit of examining the work environment of adolescent farmworkers in the framework of the informal sector. This article will address some of the nontraditional work factors associated with the less-than-formal work organization and environments in the farmworker adolescent population. In addition, this article highlights issues that may inform strategies for conducting research or planning interventions.

AGRICULTURE AS A HAZARDOUS INDUSTRY FOR ADOLESCENTS

Agriculture is one of the most hazardous work environments for children and adults in the U.S.[8–13] An estimated 1.8 million farmworkers work in U.S. fields each year; among these farmers, 126,000 children from age 14–17 worked each year between 1993 and 1998.[14] Data on fatal and non-fatal injuries among adolescent farmworkers do not exist. However, the hazardous nature of agricultural work has been documented in general, as well as specifically, for young workers. Work-related fatalities disproportionately affect young workers employed in agriculture; among 16- and 17-year-olds, 70 fatalities are estimated to occur each year.[15] Reviewing published and unpublished data, the Institute of Medicine estimated that 13,000 agricultural work-related injuries among children 10 years of age and older resulted in lost work time in 1993, and that more than 100,000 preventable agricultural-related (including work and nonwork) injuries per year occurred to young people in 1987–1992 in the U.S.[16]

Hazards specific to farmwork include machinery, falls from ladders, dehydration, heavy lifting and carrying, awkward work positions, repeated actions, pesticide exposure,[17,18] poor field sanitation, long and strenuous work hours, motor vehicle use, and child abuse.[16,19–23] The physical, psychological, and social development of adolescents needs to be taken into account when considering the impact of environmental exposures on health outcomes because the maturation of major organ systems including the reproductive, respiratory, skeletal, immune, and central nervous systems occurs during the adolescent period.[24] Because children and adolescents are in a developmental stage of intense biological changes, they are more vulnerable to developing acute or chronic health effects such as cancer, musculoskeletal disorders, and psychological problems.[25,26]

DESCRIPTION OF THE ADOLESCENT FARMWORKER POPULATION

The adolescent farmworker population is comprised of (*1*) emancipated minors, mostly undocumented transnationals, (*2*) those who work on their family's farm during the summer and sporadically during the year, and (*3*) the traditional "migrants" who travel along with their farmworker parents.[4] The best estimates of the composition of these groups are based on the National Agricultural Workers' Survey (NAWS), which reported that 47% of teen farmworkers live and work on their own without a parent (de facto emancipated minors), 29% are dependents of non-farmworkers, 18% are dependents of farmworkers, and 6%, other. Further, most teenage farmworkers are male (84%), and few are recipients of federal public assistance.[3,14] Approximately 70% of working farmworker families with U.S.-resident dependent children are classified as poor.[2] Most families are at the poverty level, making less than $7,500 per year.[2] These farmworker adolescents are at high risk of dropping out of school, an action which disproportionately affects migrant farmworkers.[14] Hard physical labor, unreliable transportation, exploitation, and nonexistent daycare are other stressors that a typical migrant family encounters.[27]

Gaps in regulation

Hired farmworkers in the U.S. are inadequately protected by federal labor laws. Legal work protections for children in agriculture differ markedly from those for children working in other industries. Children as young as 12 years of age may legally work full-time in agriculture during school breaks, compared with age 14 in other industries.[14] Working with specific hazardous jobs or machinery is prohibited by the Federal Labor Standards Act for children younger than age 16 in agriculture compared with younger than age 18 in other industries. Further, there is no regulatory protection for young people working on their family's farm.[14] Even basic sanitation standards (handwashing, drinking water, and toilet availability) were not extended to agricultural workers until 1987, and the Worker Protection Standard mandating employer-provided pesticide safety training did not go into full effect until 1995.[28,29] Despite these improved regulations, there is widespread lack of compliance.[6,30,31]

Gaps in service provision

Only 17% of eligible farmworkers use any of the need-based federally funded programs.[10] Of these programs, food stamps are used by only 10% of farmworkers, the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) is used by only 10%, and Medicaid is used by only 13%.[10] Migrant workers rarely have health insurance; they encounter barriers to accessing state-based medical benefits and cannot afford health care. They also are afraid of losing their jobs when they leave work to seek health care and often do not have the transportation to get there.[32,33] Similarly, many of the migrant farmworker children with mental health problems do not receive treatment. Of these children, 70% to 80% often do not receive the services they

need.[34] Government-funded services, including more than 100 migrant health centers, have been established to assist migrant farmworkers and their families—assistance that is greatly needed due to the number of new workers coming to this country.[35]

WORKPLACE INTERVENTIONS AND ORGANIZATIONAL FACTORS

In general, the literature on interventions to improve the quality of any work environment encompasses macro and micro changes in the work setting, including implementation of industrial hygiene standards, adequate job design, and supportive work organization.[36–38] Ergonomic issues in the farmworker population have only begun to be addressed in the literature.[39] In addition, studies on the developmental appropriateness of farm tasks for children have targeted mainly family farms.[40] In a review of job stress and work organization, Semmer described the most desirable features of work based on theory and research.[36] These include that, ideally, a job should be challenging but not overly demanding, have variety, and encompass decision-making latitude and worker control. Further, the job should have clear role requirements, reasonable expectations of job tasks in terms of learning and career development, and satisfactory working conditions, including adequate work pace, breaks, and other ergonomic issues. The job should reward workers and offer security through strong leadership.[36,37] These job characteristics should be met particularly for children and adolescents because early job experiences may imprint and leave lifelong health and social consequences. However, all of these desirable components of healthy work seem nonapplicable, at least at present, to adolescent farmworker populations.

The work organization of adolescent farmworkers is influenced by a variety of factors that also may impact the health and psychological well-being of the population. It may be a risk factor on its own, but work organization also may be a dimension important to consider for research design or implementation of interventions. According to the National Institute for Occupational Safety and Health, "Work organization refers to the way work processes are structured and managed."[41] It is a multidimensional concept including job design, scheduling of work, technology changes, and organizational characteristics.[41] Similarly, management practices also have been proposed as a risk factor for farm injuries.[42] The interaction of occupational and organizational factors should not be overlooked when assessing workplace risk. The combined effect of occupational exposure and organizational factors has been shown to be significantly correlated with increased injury risk.[43] Research or implementation of interventions in the adolescent farmworker population becomes complicated when all aspects of the work organization and environment are considered. Although there is increasing research on the impact of work organization on mental and physical health in adult working populations,[44] there is a scarcity of research focused on this concept in young workers[45]—and it remains virtually unaddressed in young farmworkers.

Social and cultural context

It is difficult to separate the occupational, economic, and social issues in this population. Issues such as poor housing, education opportunities, health care access, poor field sanitation, as well as specific job tasks, all may impact health and should be considered when planning research and interventions that are clearly needed in this vulnerable population.[10,28] We know from the occupational injury and safety literature that cultural perceptions and shared beliefs among workers are directly related to workplace injury and play a significant role in workers' compliance with standard safety practices.[46–50] These constructs have been assessed in a range of workplace settings and industries; particularly relevant are studies in the health care and construction industries.[51–55] It can be argued that the construction industry workforce is similar to the migrant worker population in that a significant proportion of these construction workers are day laborers, often undocumented, and they migrate from job to job as seasonal trends in construction impact supply and demand for workers.[2,56,57] While these studies represent more formal work organizations, the relevance of shared cultural belief systems may be important when we consider the work issues of a predominantly culturally Hispanic workforce. As the number of Hispanics in the farmworker population grows, the relevance of these cultural issues becomes increasingly important.

Finally, the literature on safety culture and its relationship to occupational injury among health care workers in Central America also may be relevant to a discussion of the cultural perceptions of a Hispanic workforce. These studies support previous findings that indicate safety climate is repeatedly one of the most significant predictors of occupational injury and compliance with safety practices.[43,58,59] This suggests that culture and shared perceptions in the workforce are important aspects of workplace health and safety,[60] and they should be evaluated in the larger context of work factors and health.

Consideration of farmwork as reflective of informal work

The work factors described above relate more directly to the formal workforce. It may be more beneficial, when planning research and interventions in adolescent farmworker populations, to consider characteristics of the informal workforce, which have been better delineated in the international literature.[22,36,61–65] Along the spectrum of occupational safety and health in the farmworker population, the needs are more basic, the workforce less protected, and the existing laws less enforced than in the more formal workforce.

Traditionally, "standard" or formal work in the U.S. has been classified by full-time employment (at least 35 hours per week), for a full-year, with an expectation for continued work between the employer and employee.[66] The most widely used term for workers in nonstandard jobs in the U.S. is contingent workers; however, there is no standard definition of this group of workers. Originally defined to include temporary workers with little job security, the term has been expanded to include temporary, part-time, contract, and self-employed workers.[67,68] The broader term may encom-

pass common characteristics of informal work, but it does not appear to be synonymous with it. Contingent work is often regulated, and since 1995, it has been part of formal workforce surveillance such as the Bureau of Labor Statistics Current Population Survey.[68] Some U.S. authors have preferred the term "nonstandard work" and have included self-employed, temporary, and part-time employees. However, this work category is still less than useful for demographic, epidemiologic, or occupational health purposes, for it includes a range of workers from unskilled hourly workers and farmworkers to highly paid professionals such as doctors or lawyers.

The term "informal work" has been used to describe a large proportion of the workforce in developing counties who work outside of the formal labor market,[65] and the term usually comprises workers in small establishments, self-employed non-professionals, domestic workers, and individuals working without remuneration.[69] In some developing countries, informal work has increased to represent more than 50% of jobs. The predominant feature is work availability vs. establishing contracts and formal relationships between employers and employees.[70] Informal work, in addition to being un- or under-regulated, also lacks information about the size of its workforce, its demographics, working conditions, and health outcomes. This gap in data and regulation enables this workforce to remain relatively hidden with a general disregard for the health and safety of these workers. Migrant farmworkers, especially its young population, seem to share common characteristics of the informal workforce. As well articulated by Santana et al., informal work often emerges in an environment of poor economic conditions and by definition offers little or no protection through governmental regulations.[61] Informal work lacks benefits, and work opportunities and conditions depend on labor market demands and the convenience of employers. Further, the unfavorable characteristics associated with informal work disproportionately impact migrants, minorities, women, and young people—who even have been referred to as the "employed unemployed."[71] The work environment of migrant farmworkers is usually ill-defined and geographically scattered like that observed for urban informal workers.

Several studies show that workers having informal jobs are at increased risk of occupational injuries. In addition, these workers report having less training and supervision than those holding formal job contracts.[64] These workers suffer a disproportionately high injury rate that goes largely unreported due to the lack of formal administrative structures and reporting systems in the informal sector. A positive association has been reported between informal work and the number of reported psychological symptoms in Brazil[61] or common psychological disorders.[65] To understand the magnitude of the problem, consider that in 2004, the International Labour Organization estimated that 246 million workers were employed in the informal sector worldwide.[72] In Latin America, it is estimated that 34% to 57% of all workers are employed in the informal sector.[72] Given the similarities of the work profile of young farmworkers to that of the informal sector internationally, nontraditional occupational risk factors should be considered in this special population.

NONTRADITIONAL WORK FACTORS

The most pertinent nontraditional work factors that affect the farmworker adolescent population include: (*1*) scheduling of work and required mobility (in the case of migrant farmworkers), (*2*) job demands, (*3*) unique educational needs of young farmworkers, (*4*) health concerns and lack of health care access, (*5*) work protection exclusions or weak adherence, (*6*) nontraditional housing, and (*7*) poverty. These factors, although not exclusively limited to nontraditional work, are quite different than work factors in the more standard full-time/full year work of the formal work sector. In addition, these work factors are disproportionately associated with adolescent farmwork.

Farm labor is seasonal and intense and includes work in all weather conditions with job demands that may exceed adolescent physical and psychological development.[73,74] Karasek's demand-control model states that jobs are potentially hazardous if they have high psychological demands and the workers have low decision-making latitude.[75] The lower social status, low wages, employment insecurity, and lack of control over working conditions may lead to psychological stress among farmworkers, similar to studies conducted in Brazil.[65] Karasek's definition of "potentially hazardous" also fits the work that many migrant farmworker adolescents do, although this model was developed and is associated with a more formal work organization.

For the migrant farmworker adolescent population, mobility also creates problems—socially, educationally, and physically. The academic performance of migrant students is generally lower than in other students by as much as 10% to 30%.[76] In order to allow parents to work when child care is not available, older siblings or other family members will often babysit younger children and take care of other household chores.[77] Many migrant farmworker children often have more medical problems than other children their age. Smith found poverty status and lacking insurance as positively related to inattention to a child's health care.[78] Also, substance abuse is often more likely in this population due to poverty, stress, early contact with adult cultural environments, mobility, and lack of recreational opportunities.[79,80] Further, the high-risk nature of their work impacts their health with injuries.[80] Although never examined in young migrant farmworkers, one of the only published studies to ever focus on job strain in working youth found a significant association between work injuries and psychological and physical job demands.[45]

RECOMMENDATIONS FOR RESEARCH AND INTERVENTIONS

Many of the health, psychological, and educational risks of this population need to be addressed through research and implementation of interventions, although the unique aspects of this less-than-formal workforce should be considered in the planning. Despite their mobility, migrant families do have a residential and social infrastructure in place that may make it possible to establish relationships needed for research and prevention programs (they just may not be the traditional ones associated with the formal labor force).

For example, cultural characteristics that are shared among many in this population include religion, Spanish language, extended family, gender roles, and belief in folk medicine.[81] Organizational safety culture, which is defined as the shared perceptions and beliefs about safety in the workplace,[46] has been a consistently significant factor in predicting workplace injury and compliance with risk-reduction strategies, including use of Personal Protective Equipment (PPE) and standard safety practices.[51,52] These constructs have been assessed in both multicultural populations in the U.S. as well as in worker populations in Central America.[58] These findings may have relevance to the largely Hispanic farmworker population in the United States. If successful research and interventions are to be established, these commonalities need to be fully understood and respected in order to create the trusting relationships that will be needed.

Previous work with farmworkers along the Texas-Mexico border and in California has demonstrated the ability to access, trace, interview, and collect meaningful information from this previously understudied population.[33,82,83] These findings support the feasibility of conducting future epidemiologic studies among adolescent farmworkers and their families, as well as implementing interventions. Migration time patterns often are predictable, although the geographic mobility may be less so. Therefore, interventions with workers while they are living in their home state may be the easiest to achieve. This would make available a physical or enumeration infrastructure and allow for a relationship to be established in an environment to which the children would be likely to return. One strategy for intervention would be to set up programs during the time that children are in school in their home state or recruit students to participate in research (e.g., through Migrant Education). Also, because many children are forced to work during the day for their families to survive, they may need to attend a special evening school, a concept that is being introduced in a large school district in Texas.[84] Recent studies conducted in the State of São Paulo, Brazil, showed that many high school students work full-time jobs and attend evening classes.[22,73] Sampling strategies should cover these special night schools as well. Preventive health care can also be aimed at children during the time they are in school. However, alternative approaches, as described below, should be considered to include the adolescents who are no longer in school.

Sampling strategies to ascertain participants for studies or programs need to take into account the attributes often associated with informal work. Although shelter is a most basic human need, the implications of housing extend to social issues and affect the design of studies and interventions.[63] A recent U.S. General Accounting Office report documented the challenges involved with enumerating farmworkers and their subsequent undercounting in the 2000 census.[85] Nontraditional housing may require special enumeration and sampling techniques. There may be multiple families living in single family dwellings, dwellings without official postal addresses, or multiple dwellings with a single postal address or post office box. Researchers may have to canvas all possible dwellings in a particular area to enumerate the entire population. This type of methodology has been demonstrated to be effective in California and Colorado.[86] Many farmworkers' homes may be located in unincorporated areas that are not mapped. For these reasons, as well as to capture students who have dropped out or never attended school and to take advantage of social networks, mapping and geographic area sampling may be necessary.[87]

A variety of strategies should be tried to enhance access to health care, education, and social services. One strategy to consider is fully educating the migrant families about which government sponsored programs they are eligible for and which their children are eligible for. Educational programs administered through churches directed to either the parents or children may be another way to reach this population. Although migrant health centers also have been used as a source to ascertain farmworkers for research purposes,[88] many of these communities are lacking the infrastructure for health care intervention.[35] Other possible strategies for interventions are the mobile health care units that provide preventative health care as well as treatment[89] or to bring services to children's homes.[90] Migrant Head Start, under the direction of the Texas Migrant Council, has an innovative program, using the model of moving with their clients and continuing to provide services while migrating.[91] Other successful programs include the promotora model for migrant farmworkers, which has increased the quality of life in this population.[35] This model is based on a promotora (promoter) who is from the community that he or she works in. The promotora is trained to provide health-related information and support to the people in his or her community.[92] These trusted community health workers may sometimes be the main or only link to the health care system and health education.[93]

The ultimate goal of these research and intervention suggestions—that consider the characteristics of the informal nature of adolescent farmworker employment—is to improve the health, safety, and well-being of this at-risk population. In a weakly regulated work environment where even existing laws are not well-enforced or adhered to, alternative strategies should be considered in protecting these young workers.[94] However, these strategies are not intended to exclude the responsibility of the government or the complex employment web of growers and contractors to meet the Occupational Safety and Health Act mandate "to assure safe and healthful working conditions for working men and women"[95]—and by extension, children. Interventions on the government and employer side of the equation must be considered within the context of more complex social, political, and economic environments. A network of multidisciplinary professionals, communities, and the workers themselves need to be involved to address the multi-faceted issues of health and safety of adolescent farmworkers.[4] Guidelines for physicians have been published for the health care of the children of migrant farmworkers,[23] as well as a review of the work hazards and safety and health communication needs of Spanish-speaking children who work or live on farms.[96] A better paid adult workforce and incentives for school attendance, perhaps including scholarships, may ultimately reduce the need for youth employment—which may be the best intervention to address the educational needs and work hazards of this vulnerable workforce.[97] A model national program initiative in Brazil, which provides scholar-

ships to families for regular school attendance instead of employment, has been quite successful and is being adopted by other Latin American Countries.[98]

Finally, interventions will need to be targeted and tailored to the heterogeneous groups of adolescent farmworkers. Most of these recommendations pertain to migrant farmworkers whose permanent residence is in the United States. However, since many adolescent farmworkers, often traveling alone, come from Mexico, considerations should be given to better identifying these populations, to taking advantage of informal networks and linked communities, and jointly planning programs with health care and social service providers, researchers, and educators in Mexico.[4,83]

CONCLUSIONS

Mobility, cultural patterns and social networks, alternative sampling strategies, alternative delivery of health care and education, and involvement of a wide range of players in the work environment of adolescent farmworkers (i.e., young workers, parents, agricultural employers, contractors, physicians, educators, consumers, occupational health professionals, and policy makers) should all be considered when conducting research or planning programs for the adolescent farmworker population. Many of the work factors that need attention are related to the informal, under-regulated nature of farm work. The need for intensive manual labor is expected to grow in the U.S.;[5] this only intensifies the need to study and intervene in the health risks of adolescents who work in the fields. From an international perspective, agriculture is the world's largest economic activity, involving more than half of the population in many developing nations and large numbers of children.[99] Therefore, consideration of the implications for nontraditional work factors on adolescent farmworkers in this country may have global implications; similarly, the U.S. can learn from the more extensive consideration of these factors that has already taken place internationally.

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