Youth Occupational Injuries: Opportunities for Prevention

by

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ABSTRACT

There are approximately three million youths under the age of 18 in the United States (U.S.) labor force annually who have sustained a considerable number of preventable work related fatalities and injuries (Runyan, Bowling, Schulman, & Gallagher, 2005). Research regarding youth fatalities and injuries consisted of a literature review done through the University of North Carolina Health Sciences Library database, Internet search through Google, as well as informal observations of youth workers in various settings. Future research is imperative in light of the gaps in the literature about best practices to prevent occupational fatalities, illnesses, and injuries for youths, who are often confusingly referred to interchangeably as children, adolescents, or teen workers in the various studies. Major points of the literature review include, but are not limited to the following findings: youth workers have unique characteristics which make them especially vulnerable to health hazards on the job; current federal and state mandates are often outdated and poorly enforced; there is a paucity of research on the subject of best practices for prevention of occupational hazards for youth; and training can be improved by tailoring materials according to a youth’s specific age, developmental level, cultural viewpoints, and individual style of learning. Despite attempts to protect this population, the National Institute for Occupational Safety and Health (NIOSH) reports that approximately 100,000 youths annually seek treatment in an emergency room for a work-related injury, and that at least 70 die from their work (2005a). The time has arrived to standardize the definition of youths to minimize confusion about who they are;
establish a governmental agency specifically accountable for the protection of all youths working the U.S.; upgrade federal and state laws as well as safety regulations for this population; improve the quality of the research; apply the research findings of best practices to real world settings; improve fatality, illness, and injury surveillance techniques for all youth workers; improve existing educational and training programs; and empower youths and their guardians to exercise their rights. Occupational and environmental health nurses are perfectly poised to make a significant impact on this target population once they become more educated about and inspired by these quiet and steadfast workers.
ACKNOWLEDGEMENTS

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Dr. Carol Runyan, who is an expert in work-related hazards for youth, generously provided me with several of her articles and created an opportunity for me to communicate with an attorney to clarify an issue on undocumented youth workers. Mary E. Miller also provided additional insights about current child labor law issues.

I would like to thank my husband, Fernando D. Daguerre, who has spent countless hours keeping our baby daughter, Anna Monique, occupied so I could research the topic and write this paper, and for the sacrifices he has made for me to pursue graduate study.
# TABLE OF CONTENTS

Abstract................................................................................................................... ii  
Acknowledgements................................................................................................ iv  
List of Tables ........................................................................................................ vii  
List of Figures ...................................................................................................... viii  
Chapters:
1. INTRODUCTION .............................................................................................. 1  
2. LITERATURE REVIEW ................................................................................... 5  
   Definitions of Youths.......................................................................................... 5  
   Significance of Problem...................................................................................... 6  
   High Risk Industries ......................................................................................... 10  
   Characteristics of Youths................................................................................ 15  
   Impact of Work on Youths .............................................................................. 21  
   Current Government Mandates and Safety Regulations ................................... 23  
   Limitations of Government Laws and Safety Regulations ............................... 25  
   Current Initiatives to Prevent Injury ................................................................. 29  
   Barriers to Effectively Address Problem ......................................................... 33  
3. STRATEGIES TO REDUCE OCCUPATIONAL HAZARDS FOR YOUTHS .......................................................................................................... 36  
   Occupational and Environmental Health Principles ......................................... 36  
   Effective Education and Training Strategies for Youths ............................ 37  
   Prevention Strategies for Youth Workers ......................................................... 38  
   Benefits of Prevention of Occupational Hazards for Youths .................... 42  
   Role of Family .................................................................................................. 44  
4. ROLE OF OCCUPATIONAL AND ENVIRONMENTAL HEALTH NURSES ........................................................................................................... 46  
   Background of Occupational and Environmental Health Nursing ............. 46  
   Limited Role of OEHNs in Settings that Employ Youths ............................... 48  
   Potential Roles for OEHNs to Address Youth Workers ................................... 48  
   Future Roles for OEHNs to Support Youth Workers ........................................ 55
5. DISCUSSION AND RECOMMENDATIONS ........................................ 56
   Limitations of Paper ................................................................. 56
   Summary of Findings ............................................................... 56
   Limitations of Current Prevention Strategies ............................ 57
   Recommendations ................................................................. 58
   Future Implications ............................................................... 62
REFERENCES ............................................................................... 64
APPENDICES ............................................................................. 72
LIST OF TABLES

2.1: Common Hazards for Youth Workers ......................................................... 11

2.2: Frequency and Rate of Work-Related Highway Fatalities for Workers
     Ages 15 to 19, 1992-2000 ........................................................................ 16

4.1: Occupational History for the Teenage Worker ...................................... 53
LIST OF FIGURES

2.1: Number and Distribution of Fatal Occupational Injuries by Age Among Young Workers, 1992-2002 ............................................................... 8

2.2: Percentage of Work-Related Deaths by Industry: Workers Under Age 18 Compared With All Workers, United States, 1992–2000 ................. 12

2.3: Number and Distribution of Fatal Occupational Injuries Among Workers Ages 17 and Younger by Race/Ethnicity, 1992–2002 ................. 20
CHAPTER I
INTRODUCTION

It is well known that the work environment presents significant occupational health risks. Nothing could illustrate this fact better than the January 2006 tragic mine explosion in West Virginia that was covered in great detail by the media. Perhaps what is less illuminated or understood is the magnitude of risk that youths face daily in a variety of settings which employ them on a formal or informal basis. Simply put, the original research questions asked were what the extent of fatal and non-fatal injury is in this special population and what prevents occupational injury? One main problem associated with these hazards is the lack of research to test current interventions and strategies. Consequently, health hazards for working youths necessitating improved prevention strategies exist.

Recent literature supports the identification of occupational hazards for youths in many sectors. In fact, the National Institute for Occupational Safety and Health (NIOSH) has identified youth employment as a critical topic to address (Horwitz & McCall, 2005). This commitment is reflected by NIOSH’s National Occupational Research Agenda (NORA) which has targeted youths as “special populations at risk” as a research priority. Youths are included in this population, and many researchers have received grants to investigate further the topics related to occupational hazards for youths. According to West, deCastro, and Fitzgerald (2005), young workers are now recognized as a group needing public health intervention and Nester (2005) asserts that the steadfast injury rates for young
workers is an “unacceptable burden...and a crisis which society must acknowledge and address” (p. 295).

According to Linker, Miller, Freeman, and Burbacher (2005) however, a gap exists on “successful interventions to promote workplace safety within this unique population”. Runyan et al. (2005) suggest that additional research is needed to further address prevention strategies to protect youth workers from workplace violence in the retail sector in particular. Vela Acosta and Lee (2001) suggest that very “few preventive efforts to protect adolescent farm workers have been implemented or evaluated” (p. 8). Furthermore in 1999, the National Research Council’s comprehensive consensus report indicated that there is a paucity of information related to “childhood” occupational injuries and reported a need for further research in several areas to better develop “effective education, primary prevention, and intervention programs” (Ehrlich, McClellan, Hemkamp, Islam, & Ducatman, 2004, p. 768). Since employment data are neither consistently collected nor documented for youths (Evensen, Schulman, Runyan, Zakocs, & Dunn, 2000), a lack of concrete data further impedes the process of research for this population.

The problem is important to examine further because youth workers are a valuable resource to many industries, especially service related sectors. Youth injuries are costly both in terms of capital and of their future productivity as adult workers. Furthermore, they are unique because of their vulnerability and deserve special attention and protection as they are in every sense of the word, dependent. It is incumbent upon adults to protect their young.
The focus of this paper is limited to youth workers in the U.S. from 14-18 years and includes all youths regardless of immigration status. The rationale for exclusion of workers less than 14 years is based on the fact that the Bureau of the Census does not include these ages and there is a lack of sufficient data on this group (Zierold, Garman, & Anderson, 2004; Miller & Salazar, 2004). Young adults greater than 18 years are excluded because the current Fair Labor Standards Act (FLSA) or child labor laws do not apply to youths once they turn 18 years (U.S. Department of Labor [U.S. DOL], 2005a). Examples of prevention initiatives to reduce harm to working youths are only noted if they are recent (past 7 years) and therefore not all known federal or state-led programs are discussed in this paper.

This paper does not address the problem of occupational illnesses as they are more difficult to measure and may not manifest until youths become adults. Furthermore, U.S. studies investigating disease and long term health outcomes associated with youth work are scarce (World Health Organization [WHO], 2005). There are no studies about the long term results of an injury from youth work experiences (Miller & Salazar, 2004). Also, non-occupational health issues of youth workers are not included. Laws that pertain to individuals 14-18 years will be referred to as child labor laws as they are commonly called by stakeholders in this area.

The purpose of this paper is to examine the significance of occupational fatalities and injuries to youths in the U.S.; better understand the laws, regulations, and strategies currently in place to prevent such incidents; and
recommend to occupational and environmental health nurses, employers, and other stakeholders updated approaches to better protect this vulnerable population. Despite the lack of concrete research findings for best practices to prevent injuries, information related to unique characteristics of youths coupled with many untested recommendations for improvement will be provided. The paucity of data in this area does not mean that employers and occupational health professionals cannot move forward with enhancing their workplaces and advocating for youth workers. It is hoped that this paper will keep the topic of youth worker injuries moving forward towards more concrete action.

For many reasons, it is critical to consider legal and other mandatory preventive strategies to protect the vulnerable population of youth workers. It is important to consider exemptions and loopholes of existing laws and safety regulations which allow for substandard work conditions that lead to preventable fatalities, injuries, and long term disabilities. Consequences of inaction in this endeavor are further tragedies for youths and their families as well as shame for the current public health experts and leaders who have the insight and skills necessary to act as advocates for this population. Not only is there a consensus among public health leaders that there is a need for more research in this area, but there is also an urgent need to apply the very few findings of sound research projects so that the latest information can impact changes at the worksite(s).
CHAPTER II
LITERATURE REVIEW

Definitions of Youths

Youth is vaguely defined by the Oxford American Dictionary as “being young,” and “the period between childhood and maturity, the vigor or lack of experience etc. characteristic of this” (Erhlich, Flexner, Carruth, & Hawkins, 1980, p. 810). One interesting problem that may stem from this imprecise definition and also contribute significantly to the challenge to better address the occupational hazards of youth workers is that there is not a standard definition of youths used as a clear reference point for governmental agencies or researchers. Nor is there a specific parameter of ages describing this population.

Adult workers are simply called adults and are described as such usually after 18 years of age. Children, adolescents, pre-adolescents, minors, pre-teens, teens, teenagers, young workers, and youths are all words interchangeably used to describe the population of individuals less than 18 years of age in current research. In the Occupational Safety & Health Administration’s (OSHA) Youth 2 Work website, youths are referred to as less than 20 years old (2005). In the NIOSH website, youth workers are defined as less than 18 years old which illustrates the fact that even among federal agencies there are varying definitions of the age parameters of youths. In the review of literature, studies did not provide clear definition of youths and in fact, rarely noted the age parameters that they were describing. In several instances where researchers did note parameters, the ranges varied widely. For example, Runyan et al. (2005) referred to youths as
teens and classified them as 14-17 years of age whereas Zierold et al. (2004) referred to youths as children and classified them as 10-14 years. Existing data collection systems of youths also use varying parameters to describe this population and occasionally include young adults over the age of 18 in their presentation of data as exemplified by NIOSH (2004c) where 19 year olds are included.

The following literature review refers to the youth worker population in a variety of ways. The information available is fragmented at best, and the most important universal points that apply to youths in general have been presented.

**Significance of Problem**

The U.S. is the highest ranked country in terms of employment of youths in the industrialized world (Miller & Salazar, 2004). Young workers typically “move in and out of employment, working in part-time, low-paying jobs” (Linker et al., 2005, p. 226). According to the U.S. DOL (2000), 2.9 million youths aged 15-17 worked during the school season, and 4.0 million worked during the summer season which is generally regarded as peak season for youths to work. While these statistics were derived from the Current Population Survey (CPS), it did not include data on workers aged less than 15 (Zierold et al., 2004). In addition, millions of young people work in violation of wage, hour, and safety regulations (Rubenstein, Sternbach, & Pollack, 1999). The 1997 National Longitudinal Survey of Youth (NLSY97) found that 30.6% of 12 year-olds worked, as did 36.9% of 13 year-olds, 35.4% of 14 year-olds, and 44.2% of 15 year-olds (West et al., 2005; U.S. DOL, 2000).
The aforementioned statistics may underestimate the actual number of working youths due to under-reporting by parents and guardians via census data (West et al., 2005) and limited data collection systems (Rubenstein et al., 1999). Additionally, informal jobs are not easily monitored and the WHO estimates that “in the U.S. 25-30% of children are working in the informal economy” (2005). Protection of youths in an informal or less structured environment is quite difficult (Runyan et al., 2005). While “the youth labor force,” defined as age 16-24 by the U.S. DOL, is expected to decrease its portion of the labor force to 13.7% by 2014 (U.S. DOL, 2005c), this population warrants our consideration for actions designed to protect them, regardless of that future downward projection. Young workers are injured in the work setting at double the rate of adult workers (Linker et al., 2005). According to Connecticut epidemiologist Estrada (2001), there are approximately 60-70 young workers who die from work-related injuries annually and tens of thousands who present to hospital emergency rooms. That means that approximately one youth worker perishes every 5 days in a work-related incident (CareerSafe, 2006). Distribution of age at time of death is illustrated in Figure 2.1. NIOSH estimates that in 1998, 77,000 young workers less than 18 years of age required emergency room treatment, and that national surveys reveal that only one third of work-related injuries are actually seen in emergency room settings; therefore, approximately 230,000 youths incurred work-related injuries that same year (Higgins, Tierney, Lins, & Hanrahan, 2004; Linker et al., 2005; NIOSH, 2003a).
FIGURE 2.1

Number and Distribution of Fatal Occupational Injuries by Age Among Young Workers, 1992–2002

It is important to note that the fatality and injury statistics are all estimates because of the current fragmented documentation. Countless surveillance gaps exist as illustrated by the following examples. The National Traumatic Occupational Fatality System (NTOF), which does not include workers less than age 16, used death certificates as sources for information on youth occupational deaths. However, because studies have concluded that approximately <21% of occupational deaths are not recorded as such, the NTOF data are inaccurate (Runyan & Zakocs, 2000). Runyan and Zacocs (2000) further assert that “no single national data system captures all cases of nonfatal worker injury” (p. 252). Furthermore, the Survey of Occupational Illnesses and Injuries (SOII), which is one of the primary sources of information about nonfatal injuries to young workers, has serious weaknesses as well. SOII data conducted by the BLS does not collect information on “young persons who are self-employed, who work in agricultural settings with fewer than 11 employees, and who are household workers” (West et al., 2005, p. 299). Additionally, BLS collects data about injuries resulting in lost work days (West et al., 2005). The Morbidity and Mortality Weekly Report (MMWR) does not include data on the incidence of youth injuries under the age of 15 in agriculture. This is due to the complexity of determining the amount of time youths work in a place where they simultaneously play and visit (Mason & Earle-Richardson, 2002). Even a state like Massachusetts, with its progressive surveillance programs and strategies for youth workers, fails to report sound injury data. While Massachusetts has mandated that physicians and hospitals report all occupational injuries to youths since 1992, it
continues to grapple with hospitals not consistently reporting the injuries (Massachusetts Department of Public Health, 2000). These examples of under-reporting reveal how challenging it is to create an effective documentation system both at the state or federal levels.

The types of occupational hazards youths face are infinite; however, some common hazards they face are illustrated in Table 2.1. More detailed discussion of hazards is found in the evaluation of high risk industries. Primary industries involved in high risk work for youths include agriculture, retail, construction, and transportation (NIOSH, 2003a). Figure 2.2 illustrates work-related deaths by industry.

**High Risk Industries**

Almost 2 million youths live or work on American farms (Reed & Kidd, 2004). Common hazards in this setting include machinery, confined spaces, elevated work stations, and work with animals (NIOSH, 2003a). Youths working in agriculture, which is the second most common employer of young workers, have more significant injuries and an uneven share of occupational fatalities compared with other industries (Vela Acosta & Lee, 2001). The majority of fatalities (42%) among youth workers occur in the agricultural setting (NIOSH, 2003a) and occur due to machinery-related incidents (Runyan & Zakocs, 2000). More specifically, Goldcamp, Hendricks, and Myers (2004) indicate the most prevalent reasons for death to youths playing or working on farms are: machinery (25%), motor vehicle (17%), drowning (16%), suicide (8%), and homicide (6%). About 45% of all occupational fatalities occur in youths less than 16 years of age.
TABLE 2.1
Common Hazards for Youth Workers

<table>
<thead>
<tr>
<th>Type of Work</th>
<th>Potential Hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>• Pesticides</td>
</tr>
<tr>
<td></td>
<td>• Ultraviolet (UV) exposure</td>
</tr>
<tr>
<td></td>
<td>• Heat stress</td>
</tr>
<tr>
<td></td>
<td>• Power machinery</td>
</tr>
<tr>
<td></td>
<td>• Heavy lifting</td>
</tr>
<tr>
<td></td>
<td>• Tractor accidents</td>
</tr>
<tr>
<td></td>
<td>• Falls</td>
</tr>
<tr>
<td></td>
<td>• Noise</td>
</tr>
<tr>
<td>Retail</td>
<td>• Heavy lifting</td>
</tr>
<tr>
<td></td>
<td>• Cuts and burns</td>
</tr>
<tr>
<td></td>
<td>• Repetitive strain</td>
</tr>
<tr>
<td></td>
<td>• Violent crime</td>
</tr>
<tr>
<td>Construction</td>
<td>• Falls</td>
</tr>
<tr>
<td></td>
<td>• Heavy lifting</td>
</tr>
<tr>
<td></td>
<td>• Blunt trauma</td>
</tr>
<tr>
<td></td>
<td>• UV exposure</td>
</tr>
<tr>
<td></td>
<td>• Temperature extremes</td>
</tr>
<tr>
<td></td>
<td>• Electrocution</td>
</tr>
<tr>
<td></td>
<td>• Trench cave-ins</td>
</tr>
<tr>
<td></td>
<td>• Noise</td>
</tr>
<tr>
<td></td>
<td>• Lead, asbestos exposures</td>
</tr>
</tbody>
</table>

FIGURE 2:2

Percentage of Work-Related Deaths by Industry: Workers Under Age 18 Compared With All Workers, United States, 1992–2000

Source: National Institute for Occupational Safety and Health, 2003b, p. 3.
(Goldcamp et al., 2004). This is interesting considering that the Fair Labor Standards Act (FLSA) child labor laws do not apply to workers less than age 16 who work on family-run farms. According to NIOSH (2003b), from 1992-2000 “76% of the fatal injuries to agricultural workers under age 16 involved work in a family business” (p. 4). A lack of regulatory vigilance coupled with the farm culture enforces the tradition of youth labor in agriculture (Reed & Kidd, 2004). Unfortunately there is limited information regarding young farm workers which can hinder attempts to improve their occupational health and safety needs (Vela Acosta & Lee, 2001). Additionally, the largest group of young farm workers is youths who have migrated from abroad, mostly from Mexico (Vela Acosta & Lee, 2001) which poses a special challenge to employers who should provide support and training in the workers’ native language(s).

More than 58% of working youths between 15-17 years of age work in the retail sector which accounts for the largest proportion of youths’ occupational nonfatal injuries (Zakocs, Runyan, Schulman, Dunn, & Evensen, 1998). Common hazardous exposures experienced in retail settings include food preparation tools, hot grease, and wet floors which can cause slips, trips, and falls (NIOSH, 2003b). NIOSH (2003b) also reports that the second highest number of youths’ occupational fatalities also occurs in the retail industry. Especially alarming is from 1992-2000, 63% of these deaths were homicides (NIOSH, 2003b). Homicide due to robbery is the most common cause of these deaths (NIOSH, 2003b; Runyan et al., 2005). “Handling cash, working alone or in small numbers, and working in the late evening and early morning hours may contribute
to workplace homicides (NIOSH, 2003b, p. 4).” According to a study on the retail industry (Runyan et al., 2005), a significant number of youth workers “report that they are not trained to deal with potentially violent circumstances at work and few teens expressed fear about this situation or taking action to avoid the risk” (p. 267). In terms of injuries, NIOSH (2003b) reports that greater than 60% of all nonfatal injuries occurred in eating and drinking establishments versus other retail settings (e.g., clothing stores). Examples of typical non-fatal injuries in the retail setting are cuts, burns, bruises, scrapes, and scratches (NIOSH, 2003b). NIOSH further reports that certain types of prohibited machinery for youth laborers are commonly found in the retail setting and that they may be instructed to use the machinery by an employer who is unfamiliar with current child labor laws.

The construction industry has many hazards. According to NIOSH (2004b), the construction industry, “which employs less than 3% of all young workers, ranks 3rd in the number of work-related fatalities to youth - at 14% of all occupational deaths to youth under 18” (p. 1). Child labor laws under the FLSA prohibit those less than age 16 from performing anything other than office work for a construction company and limiting several hazardous construction tasks for those aged 16-17 (NIOSH, 2004b). Despite this, significant occupational fatalities and injuries still occur in this industry. Fatalities in youth workers are more likely to happen in special construction trades such as roofing. Approximately 49% of fatal injuries occurred in situations where child labor laws and regulations were violated (Suruda, Philips, Lillquist, and Sesek, 2003).
Additional findings by Suruda et al. (2003) included the discovery that fatal injuries in youth workers were different from adults in that they were more likely to occur in small, non-union firms in which a significant number were exempt from existing federal child labor laws such as the FLSA and from routine OSHA inspections.

Motor vehicles and mobile machinery accounted for 45% of all fatal injuries to youth workers under age 18 from 1992-2000 (NIOSH, 2003a). “Despite current restrictions transportation-related fatalities and injuries among young workers continue to occur,” and in addition to being inexperienced in the workplace, young workers are also new to the experience of driving which increases their risk of injury significantly (NIOSH, 2003b, p. 5). Table 2.2 displays age-specific frequencies and rates of work-related highway fatalities among young workers. According to NIOSH (2003b), most of the work-related highway fatalities among workers aged 15 to 19 occurred within the industry divisions of retail trade, construction, and agriculture typically between 7am and 7pm.

**Characteristics of Youths**

There are distinctive features of youths that contribute to their vulnerability for occupational fatalities and injuries. According to Linker et al. (2005), characteristics and nature of employment are dual factors in their increased risk of illness or injury on the job. In the American Association of Occupational Health Nurses (AAOHN) and the National Association of School Nurses’ (NASN) position statement (2004a) on working youths, it was noted that
# TABLE 2.2

Frequency and Rate of Work-Related Highway Fatalities for Workers

Ages 15 to 19, 1992–2000

<table>
<thead>
<tr>
<th>Worker Age (Years)</th>
<th>Number of Fatalities</th>
<th>Percent</th>
<th>Rate/100,000 FTEs</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>12</td>
<td>3.7%</td>
<td>0.85</td>
</tr>
<tr>
<td>16</td>
<td>32</td>
<td>9.8%</td>
<td>0.77</td>
</tr>
<tr>
<td>17</td>
<td>45</td>
<td>13.8%</td>
<td>0.66</td>
</tr>
<tr>
<td>18</td>
<td>110</td>
<td>33.7%</td>
<td>1.03</td>
</tr>
<tr>
<td>19</td>
<td>127</td>
<td>39.0%</td>
<td>0.86</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>326</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>0.86</strong></td>
</tr>
</tbody>
</table>

“youths have a higher risk than adults for work injuries as a result of their lack of experience, as well as physical, cognitive and emotional development characteristics” (p. 2). This idea is further supported in the research (Estrada, 2001; Linker et al., 2005; Runyan & Zakocs, 2000).

Another characteristic common to youth is their emotional behavior which may be impossible to predict (Vela Acosta & Lee, 2000). Additionally, immature “perceptions of invincibility” may influence young workers to attempt dangerous tasks and lack the foresight to refuse such tasks (Runyan & Zakocs, 2000; Estrada, 2001). Goldcamp et al. (2004) report that youths less than 16 years of age are more likely to die as a result of size, lack of strength, and lack of ability to recognize danger. The same is true for youths age 16-19 for reasons which “may be related to underestimation of a known danger” (p. 155).

Another consideration for youths is the need for adequate sleep which can be 7-9 hours a night (AAOHN, 2004a), and their inability to meet that requirement may heighten certain risks (Runyan & Zakocs, 2000). No studies have analyzed the extent to which these normal developmental characteristics actually impact the risks of occupational injuries for young workers (Runyan & Zakocs, 2000). Other factors that contribute to sleep deprivation include the combined hours of school, homework, and extracurricular activities that are common activities for youth (AAOHN, 2004a). Youths who attend school during the daytime might be extremely tired during nightshift duty which leads to increased risk and injury, and youths who work during the daytime might be susceptible to injury due to their unmet sleep needs, especially if working the 7am
shift (Horwitz & McCall, 2005). Work combined with school activities can lead to insufficient sleep.

Young workers are less likely to receive health and safety training (AAOHN, 2004a; Linker et al., 2005) and often lack supervision on the job which may be a risk factor (AAOHN, 2004a; Ehrlich et al., 2004; Runyan & Zakocs, 2000). Runyan and Zakocs (2000) indicate that several studies found that youths routinely work without supervision and alone. It is more common for youth males to work alone than youth females, and in a study of youth workers in the retail sector, 52% stated they worked alone in the daytime hours (Runyan et al., 2005). Ehrlich et al. (2004) found that young workers are most likely to be working in the evening hours after school when supervision is less probable and when they are probably most fatigued.

West et al. (2005) state that youths are unfamiliar with requirements for jobs and not educated about their legal rights from an occupational health and safety perspective. Although Linker et al. (2005) indicate that youths may lack the self-confidence and communications skills to effectively raise safety concerns to superiors, a Johns Hopkins study conducted in a high school found that young workers would voice concern about safety if one of their peers were hurt (West et al., 2005), indicating that youths are not completely passive in their ability to effect change. Mason and Earle-Richardson (2002) concluded that the frequency of problems with job appropriate ages suggests that some children on New York farms may be developmentally inappropriate for their assigned tasks. Reed and Kidd (2004) note that size and musculature of pubescent males can be misleading
because they lack strength and flexibility. For these reasons, strategies to reduce occupational hazards must take into consideration factors unique to young workers in terms of their actual development abilities and not just their age to provide effective protection. This vulnerable population of workers depends upon and deserves healthy and safe environments.

The higher rates of injury for young male workers may be explained by varying work patterns. For example, in rural areas more males than females are likely to work in agriculture (Runyan & Zakocs, 2000). Zierold et al. (2004) also found that males may be injured more frequently and seriously than females because the tasks they perform are more dangerous. Older youths may be more prone to injury than younger ones because the FLSA allows individuals older than 15 to work longer hours and be exposed to more dangerous work roles (Runyan & Zakocs, 2000). Race also appears to impact level of risk associated with occupational injuries. The distribution of occupational fatalities by race is illustrated in Figure 2.3. Larger proportions of Caucasian youths experience occupational fatalities than minority youths; however, non-Caucasian youths are more frequently unemployed (Runyan & Zakocs, 2000). While Brown (2001) reports that Caucasian youths are more likely to be employed, minority youths work more hours per week.

Another key consideration in regards to youths’ characteristics is literacy and the ability to speak English. “Illiteracy and limited English skills affect health and safety training programs” (Rogers, 2003, p. 711). According to Delisio
FIGURE 2.3

Number and Distribution of Fatal Occupational Injuries Among Workers Ages 17 and Younger by Race/Ethnicity, 1992–2002

White, non-Hispanic 73.6%

Black, non-Hispanic 5.5%

Hispanic 16.1%

American Indian or Alaska Native 1.0%

Asian or Pacific Islander 2.5%

Other or unspecified 1.3%

(2004), the National Assessment of Educational Progress (NAEP) exams from 2002 found that 25% of eighth graders (ages 13-14) and 26% of 12th graders (ages 17-18) were reading at a substandard level and only about 70% of U.S. high school seniors graduate. Youths with poor English ability in addition to experiencing social isolation may be unable to read critical safety instructions or comprehend verbal commands (Vela Acosta & Lee, 2001). For example:

Limited English proficiency may contribute directly to workplace fatalities. For example, the U.S. Chemical Safety and Hazard Investigation Board identified language barriers in worker training as a key factor in a January 7, 1998, explosion at a chemical company in Mustang, Nevada, that killed four immigrant workers and injured another six. (Sokas, 2002, Immigrant Worker Demographics Section, Paragraph 9)

Ethnic diversity, language obstacles, and substandard educational achievement create more difficulty to improve occupational and environmental health services to this working population (Salazar, Napolitano, Scherer, & McCauley, 2004).

**Impact of Work on Youths**

The impact of work on youths' health and prosperity has fueled wide research and controversy (Evensen et al., 2000). According to Estrada (2001), work can be meaningful for youths because they learn key job skills and explore different career fields. Additionally, employment offers many possible benefits to teenagers, including opportunities to earn money for self and family; develop valuable time management, social and occupation-specific skills; develop strict work ethics; and improve self-confidence and self-worth (Rubenstein et al.,
In contrast to the studies that focus on the negative aspects of youth employment, a study of employed youths by Mortimer and Staff (2004) found that moderate levels of stressors in the work environment actually enhance coping abilities with work-related stress later in life. Brown (2001) asserts that youth who fail to make the transition into the workforce have a greater propensity to utilize welfare programs, and thus work is also a positive vehicle to decrease dependency on government assistance programs.

Although some amount of paid formal employment can correlate to positive outcomes long term, youths have minimal control in the workplace and their jobs lack challenge but expose them to substantial time pressure and stress (Evensen et al., 2000). Therefore, despite the many advantages of work for youths, it also has tremendous risks that must be considered (NIOSH, 2005a).

Working too many hours during the school season has been associated with behavioral problems such as drug and alcohol abuse, sleep deprivation, and decreased commitment to educational endeavors (AAOHN, 2004a; Estrada, 2001). Currently many jobs designated for youths “lack the skill-enhancing features that underlie the pro-work advocates’ recommendations” (Evensen et al., 2000, p. 558). Kelly (1998) found that young workers who worked in excess of 20 hours experienced more psychological symptoms such as anxiety, depression, and fatigue. This led researchers to understand that the disadvantages of youth employment are a reality. Mortimer and Staff (2004) report that respected developmental psychologists think that early work experiences put youth at risk, negatively impacting their mental health as well as their future opportunities in
life. Youths’ unique weaknesses together with the inevitable pressure in their duties result in a mixture of negative behavioral, social-psychological, and health results (Evensen et al., 2000).

**Current Government Mandates and Safety Regulations**

The main federal law that governs workers less than 18 years of age is the FLSA which came about in 1938 and was “intended to protect the educational opportunities of minors and prohibit their employment in jobs and under conditions that may be detrimental to their health” (U.S. DOL, 2006a, p. 1). This law, enforced by the Wage and Hour division of the U.S. DOL, regulates the number of hours young workers can work based in their ages and restricts specific hazardous operations (HOs) for both nonagricultural work as well as agricultural work (HO/As) through clear provisions (See Appendices A & B). According to West et al. 2005, this law applies strictly to businesses involved in interstate commerce with annual gross incomes greater than $500,000. Under federal law, students less than 16 years cannot work greater than 3 hours on a school day and 18 hours in a week (U.S. DOL, 2005b). The U.S. government has not set guidelines for 16 and 17 year olds on permissible hours of work, although many states have made their own restrictions for older youths (Kelly, 1998).

In addition to federal laws, each state has its own labor standards which expand upon the previously noted provisions. States can create more laws that are either weaker or stronger than federal laws (Runyan & Zakocs, 2000). West et al. (2005) further state that the FLSA requires that the more stringent laws take precedence. Several states also require a work permit or proof of age.
(Windau and Meyer, 2005), and this may or may not require a physician’s signature.

The OSHA within the U.S. DOL is the main federal agency in charge of ensuring the safety of all workers, including youths. The main standard derived from the 1970 OSH Act that indirectly pertains to youths is the General Duty Clause which states that employers “shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees” (Occupational Safety and Health Administration [OSHA], 2004, Section 5, Paragraph 1). NIOSH, although not a regulatory agency, also plays a vital role in safety regulations in regards to youth workers. This federal research agency is part of the Centers for Disease Control and Prevention (CDC) and conducts research for the prevention of occupational health hazards. Their research findings often contribute to the improvement of existing safety regulations or the creation of new ones. In 2003, NIOSH also became one of 26 federal agencies involved in a workgroup established by the OSHA to optimize the influence of federal resources in dealing with young worker injuries. This group developed an occupational safety and health training curriculum focused on the needs of young workers which was adopted by the Job Corps (International Labour Organization [ILO], 2004).

Despite the laws, regulations, and research agendas that are available today, much work needs to be done to improve the working conditions of youths.
West et al. (2005) suggest that despite the fact that regulations have changed the nature of work conditions and contributed to a decline in occupational fatalities and injuries for youths, this "continues to be a public health problem" (p. 299).

**Limitations of Government Laws and Safety Regulations**

There are notable limitations of existing laws and regulations. The FLSA provisions have many exemptions or loopholes through which youths can still suffer workplace abuses. These loopholes include (1) children under 16 employed by their parents in occupations other than manufacturing or mining, or occupations declared hazardous by the Secretary of Labor, (2) children employed as actors or performers in motion pictures, theatrical, radio, or television productions, (3) children engaged in newspaper delivery to the consumer, and (4) home workers engaged in the making of wreaths composed principally of natural holly, pine, cedar, or other evergreens (including the harvesting of evergreens) (U.S. DOL, 2005a).

In addition to these exemptions, the FLSA's HOs apply only to 14 and 15 year old youths and allow young workers more freedom to participate in more hazardous work than youths in non-agricultural settings (Miller & Bush, 2004). The HO regulations contain several inconsistencies. For example, a 16 year old in the agricultural industry can operate a power saw, however its use is banned in all other sectors unless an individual is 18 years (Adkins, Leonard, Maki, Mull, Nowell, Schoof, Strauss, & Woodhead, 2005). Federal OSHA regulations are also hampered in the range of work establishments they cover. According to Suruda et al. (2003), companies with less than 11 employees are exempt from routine
OSHA inspections. Incredibly, the 1970 OSH Act which is meant to protect all workers “has no special provisions for the health and safety of working youths” (AAOHN, 2004a, p. 3).

Government laws at the state level also have the potential to miss or meet the opportunity to protect youth workers. There is variability state to state in establishing a priority to protect youth workers. Maine updated its child labor laws by prohibiting those under the age of 18 from driving on the job or working alone in a cash business in which there is a high risk of robbery (NIOSH, 2005a). Indiana passed Public Law 199 in 2003 which prohibits employees younger than 18 years of age from working past 10pm, before 6am, and in an open public business when not with another employee who is 18 years of age or older (Indiana Department of Labor, 2003). North Carolina has not passed similar laws which could increase protection of young workers (North Carolina Department of Labor [NCDOL], 2005). Additionally, many states exempt or do not identify agriculture as a place of employment and some states have no restrictions for employers if they are growing a certain crop (Windau & Meyer, 2005).

Of special note is how current laws and regulations fail to properly protect vulnerable youth sub-groups such as individuals under the ages of 14, illegal or undocumented young immigrant workers, and young seasonal migrant workers. At the state and federal levels, youths less than 14 years have “likely been overlooked to a large extent because their participation in paid work activities has been unrecognized” (Miller & Salazar, 2004, p. 463). Zierold et al. (2004) note that while youths of this age are prohibited from work under the FLSA, they are
actively engaged in informal work such as newspaper delivery and family-related work in businesses and farms where significant rates of injury are occurring. In fact, the NLSY97 revealed that by age 12, approximately 50% of American youths engage in some form of work (Brevard, Calvert, Blondell, & Mehler, 2003).

While there are approximately 11 million total illegal immigrant workers in the U.S. (Passel, 2005), there is an apparent lack of open discussion of illegal immigrant youth worker’s rights under the current child labor mandates and regulations. It is difficult to know the exact number of undocumented youths who are employed as there is no official estimate; however Passel (2005) from the Washington D.C. based Pew Hispanic Center indicates that ‘Although most undocumented migrants are young adults, there is also a sizeable childhood population. About one-sixth of the population some 1.7 million people is under 18 years of the age’ (p. 4). According to Harris, an attorney with former work experience in the U.S. DOL:

The U.S. and N.C. child labor regulations apply to all employees under 18 working in the U.S. and N.C. respectively, regardless of their nationality or immigration status. A major problem, of course, is that illegal immigrants are often hesitant to speak up to the employer about safety issues or report violations to the authorities out of fear of the repercussions to themselves. (T. Harris, personal email, January 6, 2006)

Seasonal or migrant agricultural workers have additional risks that place them in danger. Since the majority (81%) of farm workers are foreign-born for example,
youths working in this sector with limited English language ability are unable to effectively learn about laws that can protect them (Vela Acosta & Lee, 2001).

Finally, only two of the HOs from the FLSA have been revised since 1970 (Miller & Bush, 2004) which reveals the critical need to quickly craft more progressive laws that consider the dramatic changes that have occurred in the workplace since the HOs were first developed. Miller and Salazar (2004) emphasize that the working world continues to evolve with new technologies, dangers, exposures, as well as other changes. In 2002, NIOSH presented a report to the U.S. DOL entitled NIOSH Recommendations to the US Department of Labor for Changes to Hazardous Orders which provided recommendations for changes in the federal laws pertaining to youth labor (Miller & Bush, 2004). The report suggests 37 modifications to be made to existing HOs (in both the agricultural and non-agricultural occupations), as well as recommending 17 new HOs (Child Labor Coalition [CLC], 2002).

In 2003, the Young Worker Safety and Health Network from the American Public Health Association’s Occupational Health and Safety Section also contributed feedback to the U.S. DOL including remarks that “workplace violence, bloodborne pathogen exposures, firefighting, youth peddling, and weight restrictions for lifting were omitted and needed to be addressed” (Miller & Bush, 2004, p. 220). “At the present time, the NIOSH report and our recommendations and the commentary are used by others to help move things along. It may take awhile, but at least the information is out there” (M.E. Miller, personal email, January 18, 2006). The U.S. DOL has not taken any concrete
action on them (Adkins et al., 2005) other than possibly examining them more closely.

A workplace may be in accordance with OSHA regulations and still put young workers at risk of injury if Federal and State child labor laws are not followed (NIOSH, 2003b). “Enforcement of federal FLSA regulations is minimal” (Runyan & Zakocs, 2000, p. 262). A 2004 U.S. DOL report found that the time spent by investigators decreased by 21.6% and that approximately 34 full-time inspectors are available to enforce the law which equates to roughly one investigator per 95,000 working youths (Adkins et al., 2005). Adkins et al. (2005) also report that in 2004 the maximum average fine imposed by the U.S. DOL to violators was $717.78 with little deterrent effect, even though a maximum of $11,000 is permissible.

**Current Initiatives to Prevent Injury**

Several initiatives, strategies, and training programs are in force, however there is limited research dedicated to evaluating which, if any of these, is effective. Runyan and Zakocs (2000) urge more detailed attention to evaluation studies which could address a wide range of interventions. Linker et al. (2005) also note that there is minimal research on helpful interventions to promote occupational safety within this unique group of workers. Despite lack of information about what is working, many stakeholders have provided leadership to reduce injuries to youth workers. Several such initiatives will be highlighted.

Since 2000, several states in the Northeastern section of the U.S. have favorably employed the state team approach to improve their ability to protect
young workers (NIOSH, 2005a). This approach is defined as using a coalition of agencies and organizations whose aim is to protect the wellbeing of youth workers through concrete projects (NIOSH, 2005a). Teams such as those in New Hampshire and Connecticut employ a variety of strategies which include teaching youth about workplace safety; educating parents, employers, health care providers, educators, and officials from the government; collecting and evaluating data; and improving and enforcing laws that pertain to youth workers (NIOSH, 2005a). One of the successful outreach programs related to education for parents was Massachusetts’ idea to create a guide for parents about how to protect their children (NIOSH, 2005a). This may be effective because several youths noted that their main source of information about health risks and safe work habits were from family members, mostly their parents (Salazar et al., 2004).

Another initiative that involves state stakeholders is the Health and Safety Awareness for Working Teens (HSAWT) operated by the Department of Environmental Health at the University of Washington in Seattle, Washington. Instead of focusing on teaching specific skills or targeting specific industries, HSAWT uses an interactive curriculum to help youths in grades 9-12 acquire skills in critical thinking that can be applied to a variety of workplaces (Linker et al., 2005). In the process of developing the curriculum for this program, representatives took into consideration factors that are unique to youths. For example, according to the Transtheoretical model, many young workers can be classified into a state of precontemplation or contemplation which means that they have no awareness of the issue or they have awareness and intend to make a
change. As a result, the program uses scenarios that are engaging and realistic for a youth audience (Linker et al., 2005). This program is a model example of an opportunity for collaboration between a state agency that regulates youth labor and an academic occupational health program.

Another effective initiative is the Fatality Assessment and Control Evaluation (FACE) Program which is located in the Division of Safety Research within NIOSH (Higgins, Tierney, & Hanrahan, 2002). The primary goal is to prevent occupational deaths by identifying particular work sectors and workers at elevated risk for fatal injuries, investigating worksites where occupational fatalities happen, and creating and spreading prevention strategies to those who have the authority to make changes (Higgins et al., 2002). The FACE website lists extensive in-house case reports with details of investigations and resulting recommendations. One such case report notes:

On March 9, 2005, a fourteen-year-old male Hispanic laborer (the victim) died from injuries sustained after coming in contact with the blade inside a Densifier. A Densifier is a machine used to shred and grind plastic bags into a recyclable product. (NIOSH, 2005b, p. 1)

Higgins et al. (2002) assert that the FACE investigations thus far prove that youth workers are killed at work while doing jobs that are in violation of federal labor laws and most striking is that in some instances young workers die performing duties that are not covered by OSHA or the FLSA.

OSHA has a Youth 2 Work website that provides youths with e-tools which are educational modules designed to be informative and interesting.
Additionally, the U.S. DOL started a website *YouthRules!* in 2002 to increase public education about Federal and State laws and regulations concerning youth workers (U.S. DOL, 2006b). Through this initiative the U.S. DOL, in partnership with several states and many organizations such as the CLC and National Grocers Association among others, hopes to promote improved working conditions for this century (U.S. DOL, 2006b). The U.S. DOL is also involved in FACE activities according to Higgins et al. (2002) who indicate that the U.S. DOL’s Employment Standards Administration’s Wage and Hour Division has been reporting young worker deaths to NIOSH.

Many efforts have been started to encourage occupational safety and health (OSH) awareness in vocational and technical education (Schulte, Stephenson, Okun, Palassis, & Biddle, 2005). In fact NIOSH (2004a) has even provided 80 safety checklists to keep classrooms, shops, and laboratories safe for instructors and students in career technical education. One worthwhile initiative is the pilot program in Texas by the Texas Engineering Extension Service named TEEX which involves using trained vocational instructors as OSHA construction outreach OSH trainers (Schulte et al., 2005). In 2003, TEEX successfully introduced its CareerSafe *Online* OSHA 10-Hour Course which is an Internet based, interactive designed course that teaches fundamental safety knowledge (CareerSafe, 2006). Upon completion of this course, a student receives a wallet card and a “safety mindset” that will be helpful to them at work and in their personal lives (CareerSafe, 2006). Schulte et al. (2005) point out that the majority
of European Union member states have committed more energy than the U.S. in terms of bringing OSH issues into education.

Healthy People 2010 provides a complete picture of the health status of the U.S. including occupational health and safety topics, and provides national health objectives to improve health and decrease disease (Rogers, 2003). The U.S. Public Health Service has a Healthy People 2010 objective to reduce youth emergency department injury rates from 5.2 injuries/100 full-time equivalents in 1999 to 3.4 injuries/100 full-time equivalents by 2010 according to NIOSH (n.d.a).

There are countless initiatives, strategies, and varieties of training programs that exist in the United States. However the problem is our lack of understanding about which initiatives are truly effective. Runyan and Zakocs (2000) note that “sparse as the literature is on risk factors underlying adolescent worker injury, the literature on interventions is even more limited” (p. 261).

**Barriers to Effectively Address Problem**

Several factors may impede progress to prevent occupational injuries to youth workers. Pickett, Marlenga, and Berg (2003) note that typical approaches to occupational hazard prevention include education to raise awareness, changes to the actual work environment to protect the worker, and enforcement of OSH regulations. NIOSH (2003b) notes that “employers, educators, parents, and young workers may not be aware of safety and health laws designed to protect young workers on the job” (p. 8), therefore an extensive lack of education may be one significant obstacle. Zakocs et al. (1998) found that the training of young
workers needs significant improvement; therefore one can conclude that absent or sub-standard training processes are a potential barrier. Another problem may be the real and perceived costs involved in compliance with safety laws and regulations. The activation of strategies to impact compliance with rules may present a big economic burden on both business and industry (Rogers, 2003). In fact, the agricultural industry has historically fought against legislated safety standards (Pickett et al., 2003).

Further obstacles to improving health and safety of young workers may include the rapid paced nature of work which lends itself to injuries, young workers’ feelings of lack of control over their work environment, and employers or managers avoidance of the responsibility to create a safer work environment (Zakocs et al., 1998). Also troubling is the missed opportunity to provide improved engineering controls in high risk settings for youth workers. For example, OSHA (1998) provided clear guidelines for retail establishments to improve engineering controls such as bullet-resistant barriers, and the possible lack of attention to such preventive measures creates an atmosphere where fatal injuries can occur. According to a Wisconsin FACE report on December 10, 1999, a 16 year old cashier died when she was shot during a robbery attempt in her family's restaurant (NIOSH, n.d.b). Among the many recommendations from that report was the suggestion that physical barriers such as the use of bullet-resistant protection may decrease risks of injury to employees (NIOSH, n.d.b).

A lack of effective enforcement will continue to be a problem unless dramatic reform takes place in enforcement tactics. Runyan & Zakocs (2000)
stress that enforcement of FLSA regulations is minimal and that there are multiple flaws in the current structure of policing in terms of inadequate number of inspectors as well as weak penalties. Zakocs et al. (1998) state that “relatively little is known about how teens’ view their work environments” (p. 343), therefore strategies without input from these vital stakeholders may be ineffective.
CHAPTER III

STRATEGIES TO REDUCE OCCUPATIONAL HAZARDS FOR YOUTHS

Occupational and Environmental Health Principles

The goals of occupational and environmental health practice were originally defined in 1950 by the Joint ILO/WHO Committee on Occupational Health and stated:

Occupational health should aim at the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations; the prevention amongst workers of departures from health caused by their working conditions; the protection of workers in their employment from risks resulting from factors adverse to health; the placing and maintenance of the worker in an occupational environment adapted to his physiological and psychological capabilities; and, to summarize: the adaptation of work to man and of each man to his job. (Fedotov, Saux, & Rantanen, 1998, Objectives of Occupational Health Practice Section, Paragraph 2)

In the U.S. young workers have rights of which they are often not aware. Occupational and environmental health professionals are poised to assist workers in exercising their rights and are ethically bound to do so. According to OSHA’s Youth 2 Work website (2005), worker rights include a right to a safe and healthful workplace free of recognized hazards through the OSH Act of 1970; a right to refuse to work in dangerous conditions; a right to report safety hazards to supervisors and/or OSHA; a right to work only the hours permitted by law; a right
to use appropriate personal protective equipment (PPE); a right to receive health
and safety training; a right to proper payment under the law; a right to request
workers’ compensation if ill or injured on the job; and a right to work without
racial or sexual harassment.

Effective Education and Training Strategies for Youths

Education about safe working conditions, according to Higgins et al. (2002), is a critical complement to enforcement of child labor laws as well as OSHA laws and regulations. Zierold et al. (2004) found that both middle and high school students received minimal health and safety training before initiation into the work world and when students did receive training, they were not better protected from injury than working peers. Zierold et al. (2004) suggest strategies to improve training such as the development of age and developmental appropriate safety curriculum and to include safety education and training into the school course of study. Sitzman (2002) states that age appropriate education has the potential to enhance health and safety manners. Young workers need to be taught in a way that is appropriate not only for age, but also for awareness level about their talent to influence issues related to workplace safety (Linker et al., 2005).

Key strategies, according to Sitzman (2002), for health and safety education of youths include the following suggestions: use peer teaching sessions because youth gain advantage from exposure to other youths who have successfully coped with similar issues; use group discussion, role playing, and gaming which help youths feel they fit in and are actively engaged; and use the
latest technology such as interactive computer games because youths are at ease with this technology secondary to their probable exposure to it. Linker et al. (2005) stress the importance of providing hand-on teaching activities so that the audience does not become bored, and to design simple materials for teachers to use so that the most important content pieces are delivered.

It is critical to apply the latest research findings to the planning and implementation of education and training programs. It is also important to create effective curricula by garnering support from stakeholders such as workers, parents, teachers, and employers (Linker et al., 2005). Reed and Kidd (2004) found that involving students and teachers in the planning stages of curriculum development resulted in modules that were true to nature, excellent quality, and appropriate to work done by students. Zakocs et al. (1998) stress that building on youths' anxieties and ideas for improving the safety culture may improve training relevance and in the long-term lead to better approaches to intervene. It is also crucial to consider organizational, social, and cultural obstacles that prevent young workers from working safely when designing training programs instead of solely focusing on theoretical models of individual change or personal behaviors (Salazar, et al., 2004). Horwitz and McCall (2005) suggest that a special focus on providing rigorous training and apprentice programs would be suitable in high risk work settings.

**Prevention Strategies for Youth Workers**

Before safety strategies to reduce occupational injuries for young workers can be addressed, an understanding of what circumstances or risk factors are
present when youths are injured or killed on the job is necessary. The workplace setting and young worker characteristics play a role in injuries. It should be noted that very few interventions or strategies to reduce young worker hazards have been tested (Runyan & Zakocs, 2002; Salazar et al., 2004). In fact Salazar et al. (2004) state that in order to be genuinely successful in efforts to protect this vulnerable population, strategies must be evaluated. Nonetheless, governmental agencies and researchers alike generally provide suggestions of preventive approaches. NIOSH (2003b) reports that the following general issues increase the chances for fatalities and injuries in all sectors for young workers. Young workers may: have inadequate training; take the risk (risk-taking) to perform tasks not assigned to them; lack proper supervision; lack an understanding of hazards related to work processes; lack emergency response skills; and young workers along with their families and employers may avoid compliance or be unaware of child labor laws. In addition to these factors, Mason and Earle-Richardson (2002) note that a lack of engineering controls also poses a major hazard.

Higgins et al. (2002) report that another common contributor to youth worker deaths specifically was young workers acquiring dangerous behavior by observing co-workers. Westaby & Lowe (2005) found that “social perceptions about supervisors, coworkers, and parents are important factors underlying youths' risk-taking orientation at work, with coworkers' risk taking demonstrating a relatively strong effect” (p. 1034). Furthermore, Westaby & Lowe (2005) note that risk-taking orientation led to work injury. Evensen et al. (2000) found that
aspects of the workplace and labor process influence injury more than personal characteristics of youths, and they report that "Regardless of the complexity of hazard exposure in the workplace, being rushed significantly increases teens' burden of injury" (p. 557). Runyan and Zakocs (2000) found that certain high risk industries predispose the young worker to an increased risk of injury. These high risk industries previously noted include agriculture, retail, and construction.

In response to the risk factors associated with occupational injuries for young workers, a variety of prevention strategies are available. For retail related injuries, it may be suitable to institute a work restriction for youths to decrease their exposure to dangerous work settings. This could be done by stopping employment in high risk environments such as late night convenience stores, locations known to be high crime zones, and conditions where workers are alone or work high risk hours after dark (Runyan et al., 2005). According to Higgins et al. (2002), the following prevention strategies were derived from young worker FACE investigations in 26 states from 1992-1998: employers should have a thorough injury prevention program which includes clear procedures for identifying and remedying safety problems; employers should provide appropriate safety training, supervision, PPE, and safe equipment; employers should strictly follow all current occupational safety and health requirements by law; employers should educate themselves about child labor laws; and government agencies, school officials, and health and safety organizations should continue to educate the public about child labor laws. NIOSH (2003b) recommends that young workers take the initiative themselves to know about and adhere to safe work
practices, inquire about training, ask about potential hazards, and be aware of their rights and current laws. NIOSH (2003b) also recommends that employers take the initiative to recognize potential hazards, appropriately supervise young workers, provide sound training, comply with laws, and develop a comprehensive injury prevention program.

Zakocs et al. (1998) suggest that employers should schedule more employees during busy times to reduce injuries, however acknowledge that realistically this would not happen unless a cost-benefit analysis is conducted to prove that this strategy would save money by reducing expenses associated with workers’ compensation. In order to empower young workers and diminish their feelings of powerlessness in the work setting, managers also need to communicate and interact with them in less threatening ways (Zakocs et al., 1998). To reduce dangerous risk taking behaviors of young workers, Westaby and Lowe (2005) recommend that organizational level initiatives that stop coworker risk taking may be very useful for lessening the severity of youths' risk taking orientation. As an example, Westaby and Lowe (2005) indicate that “management could publicly encourage work groups to not engage in nonessential risk activity, which should impact group norms. However, because many jobs require calculated risks, management should be explicit about who is allowed to take such risks when necessary” (p. 1032).

Zakocs et al. (1998) and West et al. (2005) suggest that employers who comply with child labor laws and improve working conditions for youths should receive incentives and recognition for their efforts. These companies can serve as
role models to teach other employers the benefits of changing the workplace environment.

**Benefits of Prevention of Occupational Hazards for Youths**

One striking advantage of eliminating and reducing injuries to youth workers pertains to the costs associated with young worker injuries. It has been estimated that both direct and indirect costs of work-related injuries for youths are approximately $5 billion yearly (Runyan & Zakocs, 2000; Schulte et al., 2005). According to Runyan and Zakocs (2000), costs associated with youth workers’ injuries represent a smaller fraction of total injury expenses than the costs for the general population (3% vs 8%). Nonetheless, the costs of their injuries make an impact and are worth serious consideration. In 2003, the American Society of Safety Engineers (ASSE) remarked that from a business angle, investing and using sound occupational safety, health, and environmental programs is not only beneficial for young workers, but also good for the “bottom line”. Furthermore ASSE (2003) noted that employers and industries that invest in prevention of occupationally related injuries, illness, and fatalities earn significant savings as both their medical and workers’ compensation costs decrease. These employers realized more savings and profit through reduced absenteeism, lower turnover rates, higher productivity, increased employee morale and a positive brand image” (ASSE, 2003, Paragraph 7).

According to Conte (2000), youths represent just 5% of all workers; however several industries could not survive without their skills. Conte (2000) notes, for example, that according to the National Restaurant Association more
than 25% of all restaurant and food preparation employees are youths. “Twenty percent of all grocery workers and 15% of department store employees are between the ages of 16 and 19, according to the U.S. Bureau of Labor Statistics, and young people also have 16.2% of the entertainment industry jobs” (Conte, 2000, Paragraph 9). It is clearly advantageous for the U.S. economy to keep young workers in these business sectors. Interestingly, a further advantage is that youths would support the Social Security system. According to Osio (2004), the baby boomer generation in the U.S. is getting closer to retirement and since it is projected that the Social Security system will be supported by fewer young workers at that time, Hispanic youths, as part of a growing influx of immigrants, will be a significant part in countering dwindling funds in that system. One logical conclusion is that keeping young workers healthy and safe on the job can only enhance the Social Security system.

There are positive aspects to maintaining healthy, safe working environments for the workers themselves. One key aspect is that youths are our future workers, so health and safety education learned early can prepare them for effective long term work safety habits as adult workers. Conversely, work environments without proper training on health and safety set the tone for possible future adverse outcomes as adults. “Educating teens while they are new to the world of work also can potentially decrease occupational injuries when they become adults and consequently, have lifelong benefits for teens” (Linker et al., 2005, p. 236). Miller and Salazar (2004) assert that “an approach to preventing these injuries for young workers, the future adult workforce, also may have more
far reaching effects than we know” (p. 463). Mason and Earle-Richardson (2002) found, in a New York agricultural study, that adults could pass down unsafe work habits to their children. Once youths become parents, it is hoped that they would teach their own children about safe work practices. Therefore investing in safe work practices should create dividends for tomorrow’s youth workers.

**Role of Family**

The role of the family or guardians in influencing future youth work behaviors and decisions cannot be underestimated. Recent research by Gardner and Schnabel (2006) suggest that youths' perceptions of parents' jobs have implications for their adulthood experiences. Westaby and Lowe (2005) evaluated the level of influence of parental risk taking on youths' risk awareness and found a positive link between perceived parental risk taking and youths' risk taking. Therefore, Westaby and Lowe (2005) suggest that:

Reducing parents' modeling of high-risk behaviors would mitigate their children's tendencies for global risk taking. However, because there are many family events that have reasonable risks relative to the enjoyment associated with the activities (e.g., in-line skating), parents should, at a minimum, attempt to model injury prevention strategies (e.g., wearing protective equipment). (p. 1032)

FACE recommendations reveal that parents should talk about employment decisions with their children and ask about the workplace characteristics of the jobs such as the type of work they are assigned, the types of equipment used, and
the extent of supervision and training they receive (Higgins et al., 2002). Higgins et al. (2002) also suggest that parents should take the initiative to contact appropriate governmental agencies when they have questions about their children’s work. Unfortunately, Zierold et al. (2004) noted that many students as well as their parents are not aware of child labor laws, when a work permit is needed, and even what steps should be taken if an injury occurs. Therefore, it is unlikely parents would be savvy enough to reach out to governmental agencies such as OSHA or the U.S. DOL’s Wage and Hour Division.

On a final note, Salazar et al. (2004) warn that health and safety professionals can neither assume that parents of young workers will teach safety principles, nor convey to their children the specific points of all the health and safety regulations that apply to them. This is especially true in the agricultural setting, where approximately 80% of young farm workers are emancipated minors living independently (Vela Acosta & Lee, 2001). Where parent(s) or guardians are available, however, they should take an active approach in their child’s work (West et al., 2005).
CHAPTER IV

ROLE OF OCCUPATIONAL AND ENVIRONMENTAL HEALTH NURSES

Background of Occupational and Environmental Health Nursing

The origins of occupational and environmental health nursing, which was originally referred to as industrial nursing, has been traced back to late 19th century England where a woman named Phillipa Flowerday served the needs of workers in the J & J Coleman mustard factory (Institute of Medicine [IOM], 2000). The purpose of this specialty area is to apply nursing and public health principles towards the conservation of the health of workers in all occupations in rapidly changing work systems (Levy & Wegman, 2000). Historically, early industrial nurses as they were called treated the whole community and family when they would visit workers’ homes (Rogers, 2003). Occupational and environmental health nurses (OEHNs) and related safety professionals are in a position to reduce work-related injuries by nature of their specialty. Miller and Salazar (2004) note however, that traditionally most occupational health and safety measures have targeted adults, while injury prevention initiatives for young individuals rarely considered occupation as the cause of injury.

The primary responsibility for OEHNs is to improve the quality of life for the worker, and in collaboration with others, reduce work-related illnesses and injuries. Secondary responsibilities include reduction of healthcare and other operating costs for companies, participation in the development of programs to fulfill federal and state regulations, improvement of community health, and
countless other opportunities for public health improvements and promotion. One definition that provides a better understanding of the breadth of the OEHN role is:

Occupational and environmental health nursing is the specialty practice that focuses on the promotion, prevention, and restoration of health within the context of a safe and healthy environment. It includes the prevention of adverse health effects from occupational and environmental hazards. (Rogers, 2003, p. 52)

Further insight about the essence of this field of nursing is found in the Code of Ethics developed by the American Association of Occupational Health Nurses (AAOHN) which is the professional association which guides and supports OEHNs (AAOHN, 2003; Rogers, 2003). Ethics are not law, but a guide for moral action (Rogers, 2003). Rogers (2003) states that “the nurse as a moral agent is concerned with the values, choices, and duties related to the good of individuals and larger societies and with upholding and advancing the standards and codes of the profession” (p. 669). Furthermore, OEHNs should use an ethical guide in their practice in order to provide sound practice and protect workers from health hazards (Rogers, 2003).

According to OSHA’s General Duty Clause, the employer (and OEHNs as agents of the employer) has an obligation to provide a safe workplace for all workers (Sever, 2000). While OEHNs have traditionally focused on the general safety needs of adults in particular, they also focus on high-risk groups, such as young workers (West et al., 2005). NORA’s latest research agenda further implores this field of nursing to evolve their area of expertise into the realm(s) of
vulnerable populations such as youth.

**Limited Role of OEHNs in Settings that Employ Youths**

The Health Resources and Services Administration (HRSA) reports that roughly 20,040 registered nurses (RNs) are currently working in the field of occupational and environmental health nursing with a future need estimated at 22,390 by the year 2020 (Palmer, 2003). In light of the current and projected nursing shortage of 400,000 full time equivalent RNs by 2020 (Palmer, 2003), it will become imperative for OEHNs to collaborate with other stakeholders interested in the protection of young workers as they will be called on to “perform more with less.” Especially troubling for youths is that “more frequently, occupational nurses oversee the work settings where adult workers are employed” (Higgins et al., 2002, p. 514) rather than where young workers are employed. For example, it would be uncommon to find OEHNs in small retail shops. OEHNs will have to develop strategies to approach this problem creatively. One measure is that nurses can educate and influence adult workers who are parents or grandparents to become more involved with the decisions children make about employment settings (Higgins et al., 2002). In fact, there are several roles that OEHNs can play to impact this known public health problem.

**Potential Roles for OEHNs to Address Youth Workers**

Practice roles vary for OEHNs and are dependent on the environment in which they work. These roles also require various levels of functioning. Some major roles include: Clinician/Practitioner, Case Manager, Health Promotion Specialist, Manager, Educator, Researcher, and Consultant (Rogers, 2003).
et al. (2005) recommend that measures to assist young workers can be classified into four areas: surveillance, education and outreach, advocacy, and research.

Surveillance is defined by Rogers (2003) as “The ongoing systematic collection, analysis, and interpretation of health data essential to the planning, implementation, and evaluation of public health practice and dissemination of information” (p. 305). The collection of data on occupational injuries and fatalities needs to be widened and coordinated to include a focus on young workers and their exposures, and OEHNs are in a position to coordinate this process on many levels (West et al., 2005).

Education is a key strategic tool to reach young workers as well as those who interact with them in the home, school, or work environments. Age appropriate or tailored education could improve the health and safety outlook for youths (Sitzman, 2002). Tailoring education to an individual’s language and reading abilities is crucial as America becomes increasingly diverse, and a significant number of youths are functionally illiterate. Rogers (2003) notes that it is critical for OEHNs to develop partnerships with English as a Second Language (ESL) and literacy teachers to enhance their ability to develop effective literacy programs. It makes sense for nurses to serve as leaders in the development and distribution of health related safety messages since they have credibility (Reed & Kidd, 2004). It is important for OEHNs to provide educational materials to parents so that they may become more enlightened about the regulations that guide the activities and work hours of their children as well as their right to file for workers’ compensation in the event of an injury.
(Miller & Salazar, 2004). OEHNs can “disseminate materials related to young worker safety to adult workers and their families through company newsletters” (Higgins et al., 2002, p. 514). One bilingual educational resource that may be helpful is the pamphlet *Are you a Working Teen?* accessible on the NIOSH website which has information on young workers’ rights on the job, allowable work hours, and details related to safety responsibilities (NIOSH, 1997).

Pickett et al. (2003) warn that there are some limitations to the extent that education can change behaviors in parents. They found that many farm parents, although educated about the North American Guidelines for Children’s Agricultural Tasks (NAGCAT) guidelines, still assigned their own children to developmentally inappropriate duties. In other words, education alone is insufficient to curtail all hazards youths encounter in the informal and formal workforce.

The AAOHN has identified 11 professional practice standards that illustrate a competent level of performance for OEHNs. These standards should “support the nurse’s judgment in reaching expected outcomes related to interventions” (Rogers, 2003, p. 692). Standard IX: Collaboration, encourages collaboration with employees, management, other health providers, professionals, and community representatives (AAOHN, 2004b; Rogers, 2003). OEHNs working in collaboration with other disciplines can approach the problem in a multi-faceted manner to provide a more comprehensive solution.

One example of promising collaborative efforts is the recent release of a position statement on the role of OEHNs and School Nurses (SNs) to promote
safe and healthful environments for working youths. According to Susan Randolph, current president of the AAOHN, "These two groups of healthcare professionals have the collective skills, knowledge and competencies essential for advocating the continued protection of America’s youth workers" (AAOHN, 2004, September 2). SNs especially benefit from the support of OEHNs, because they “serve as members of school health and safety committees and provide leadership to colleagues about safety and health issues” (Higgins et al., 2004, p. 2). SNs have the opportunity to provide educational materials to teachers who can inform students about their work rights, perils they may face on the job, and skills to protect themselves (Miller & Salazar, 2004). In addition the two fields can literally work together to implement projects. Some examples of shared strategies between OEHNs and SNs include advocating for youths to be informed about job safety regardless of the size and type of company, informing employers of potential sleep deficits of their youth workers, and encouraging health professionals to counsel youth and their parents at the time they sign work permits (AAOHN, 2004a).

From 1997 until 2001, NIOSH funded the Agricultural Disability Awareness and Risk Education Project (AgDARE) as part of the 1996 Child Agricultural Injury Prevention Initiative to address the alarming rates of injuries on the farm (Reed & Kidd, 2004). Reed and Kidd (2004) conducted a study in 21 schools in Kentucky, Iowa, and Mississippi and found that AgDare demonstrates how different disciplines can successfully work together to effect positive changes in high school students’ attitudes in regards to working safely. In fact Reed and
Kidd (2004) assert that AgDare curriculum can serve as a model for public health nurses, OEHNs, and SNs to work with teachers in typical class settings.

In addition to forging working relationships with SNs, OEHNs should reach out to family practitioners and pediatricians to further effect change for young workers, as they have contact with youths and their guardians/parents during clinic appointments. In fact the American Academy of Pediatricians (AAP) recommends that pediatricians ensure that the community becomes educated about how health and safety principles impact youths with an emphasis on agricultural health if relevant (Pickett et al., 2003). Since occupational injuries are largely preventable, family physicians can also help young patients avoid these work-related hazards through appropriate office-based interventions such as a questionnaire (Rubenstein et al., 1999). An example of such an intervention is illustrated in Table 4.1. The WHO (2005) also strongly suggests that:

Health professionals should be prepared with the support of occupational health and safety professionals to recognize early signs and symptoms of child labour, to evaluate child worker exposure, and to establish a causal link between the work and health problems. (p. 3)

An advocate is defined as someone who pleads on behalf of another (Ehrlich et al., 1980). According to Rogers (2003), advocacy that extends beyond the realm of the traditional health care setting (as is the case with much of occupational and environmental health nursing) is a novel experience for “many nurses who may feel unprepared to translate research and practice issues into health policy terms” (p. 258). There are innumerable tasks that OEHNs can do on
**TABLE 4.1**

**Occupational History for the Teenage Worker**

1. What exactly do you do at work, including overtime and occasional tasks?
2. What tools, equipment and machinery do you use at work?
3. What chemicals do you use at work?
4. Do you work alone?
5. Is there an adult supervisor present in your work area?
6. Have you received any training in how to perform your job safely, including training related to emergency situations (e.g., escaping a fire, handling potentially violent customers, seeking help if injured)?
7. Has your employer given you any protective equipment (e.g., gloves, safety shoes, hard hat, mask, goggles) to wear on the job? Are you using this equipment? (If not, why?)
8. Are you aware of basic first aid measures (e.g., treatment for burns, strains, sprains)?
9. What hours do you work?
10. Do you have time to eat between school and work? Do you have meal breaks during work hours?
11. How much time do you spend each day on homework? Are you also involved in family, social, religious and community activities?
12. How many hours of sleep do you get on school nights?
13. Have your grades changed since you started working? Have you chosen easier courses since you started working?

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behalf of young workers. For example, West et al. (2005) encourage OEHNs to
call for a decree of federal limits on work hours for young workers between the
ages of 16-17, call for an alteration of the hazardous job orders (HOs), and
encourage young workers to become involved in the Youth Worker Safety
Congress. OEHNS should advocate for improved enforcement of the regulations
for young workers either by the U.S. DOL’s Wage and Hour Division or the
state’s labor divisions (Miller & Salazar, 2004). In addition, OEHNS who have an
opportunity to associate with managers of youths should encourage them to
become familiar with current child labor laws and to consider decreasing hours
for older youths despite the fact that there is rarely regulation of their hours.

Research is another realm that can positively impact young workers. The
role of OEHN researchers is quickly expanding with a focus on enhancing the
health and safety of the workforce and preventing work-related injuries
(Randolph, 2003). West et al. (2005) confirm that continued research is needed in
the areas of evaluating risk factors such as fatigue, extent of training, high
intensity work; the differences among types of young workers (e.g., gender, race);
and the emotional impact of youth employment. Additionally, it is critical to
evaluate which strategies are effective in promoting the health and safety of this
particular population (West et al., 2005). Specific duties of OEHN researchers
may include helping to identify researchable problems, participating in the
development of research, analyzing data, and disseminating research findings to
others (Randolph, 2003). There appears to be little research generated by past
OEHNs on the topic of youth work hazards based on few articles published in the
past several years.

**Future Roles for OEHNs to Support Youth Workers**

Efforts must be made to create interventions tailored to young workers that focus on surveillance, education, advocacy, and research (West et al., 2005). Rogers (2003) asserts that OEHNs “must be visionary in their roles and anticipate what may be coming in order to adapt to these changes” (p. 97). New roles will need to be pursued as society changes. There are many rising influences that may impact how OEHNs need to change in order to flourish and demonstrate leadership. These include changing demographics in the workforce, technological advances, and a projected nursing shortage. By the year 2010, minorities will make up 30.8% of the workforce, and the youth labor workforce is expected to grow more quickly than the overall workforce (Paranzino & Buckler, n.d.). According to the North Carolina Office of Minority Health (1999), Latinos in particular are projected to be the largest minority group in the U.S. by 2010. In light of these projections, recommended individual future roles to respond to the needs of youths working in the U.S. may include the following: specialized experts in youth health, OEHN lawyers or legal consultants advocating for youths, international consultants/global health policy makers on issues relate to youth labor, federal policy makers, inspectors, and other unknown unique and powerful roles.
CHAPTER V
DISCUSSION AND RECOMMENDATIONS

Limitations of Paper

Limitations of this paper include a lack of formal direct onsite review of settings that employ youths and the lack of current research available on this topic. This report would have been strengthened by speaking with working youths about their risk perceptions.

Summary of Findings

Young workers face significant dangers at work. The primary questions this paper sought to answer were what is the extent of fatal and non-fatal injury in youth workers and what can prevent occupational injury? Fatalities decreased for many age groups between two 5-year periods during 1993-2002, however fatalities increased 34% for workers between the ages of 14 and 15 (Windau & Meyer, 2005). Hispanic young workers have seen an increase from 37% to 66% during the 1998-2002 period and this is most significant in the agricultural sector (Windau & Meyer, 2005). Nester (2005) reminds us that despite the overall improvements in the fatality counts for young workers, the injury and illness rates remain unyielding. Therefore, despite progress in one aspect of youth worker hazards, there is still a lot of effort required by all stakeholders to quell this problem.

Runyan and Zakocs (2000) note that there is a lack of research related to the identification of risk factors for young workers which results in difficulties in tailoring either worker or workplace interventions. Although many agencies and
organizations have suggested enforcing and updating the child labor laws and launching different educational programs, minimal research has been done to evaluate whether or not any of these suggestions are effective (Runyan & Zakocs, 2000). Despite limited research on these suggestions, modernizing laws and regulations makes sense since there have been few amendments to the 1938 FLSA which is the main source of child labor laws.

Runyan and Zakocs (2000) also suggest that “as with other injury problems, engineering and environmental approaches probably have more promise than interventions directed solely at achieving changes in behavior through worker education” (p. 265). Control measures which are focused on hazard reduction should be used wherever possible in order of hierarchical effectiveness (Rogers, 2003). Rogers (2003) explains that the following are risk decreasing strategies in hierarchical order of importance: elimination/substitution, isolation and containment, engineering controls, work practice controls, administrative controls, and personal protection (PPE). A New York agricultural study conducted by Mason and Earle-Richardson (2002) found that fatalities may be avoided with more engineering control research into whether agents such as a tractor trailer might be re-designed to protect the workers by having it better tolerate bumps and hills to prevent fall-offs or overturns.

Limitations of Current Prevention Strategies

In order to more effectively address the hazards and needs of the youth worker population, there should be a consensus by various academic, governmental, and private researchers on exact age parameter(s) and
corresponding descriptive word(s) to better organize research and to prevent confusion as well as overlap of investigation(s). To increase meaningful research, all stakeholders should use the same definition of youths. Additionally, more intensive surveillance and identification of injury incidence rates are needed to improve injury prevention strategies (Mason & Earle-Richardson, 2002).

Problems with surveillance include “(a) problems with definitions, (b) problems in identifying and measuring injuries (numerator data), (c) problems in identifying aspects of work experience (denominator data), and (d) problems assessing the outcomes of injury” (Runyan and Zakocs, 2000, p. 259).

Recommendations

One recurrent theme in the literature pertaining to youth occupational injuries was the scarce research findings currently available and the need for further work. There is indeed a need for more rigorous research by a variety of stakeholders. “Future intervention research must, to the extent possible, rely on rigorous study designs (e.g., randomized controlled trials) to clearly document intervention effects, reduce bias, and maximize the ability to generalize from study results” (Runyan & Zakocs, 2000, p. 265). In addition, most of the available research is on high school age youths and older. Therefore it is imperative that researchers consider that youths under 14 years get injured and die while working mostly informal jobs. Almost no information exists on the number of middle school children ages 10-14 years who are working, the types of jobs they are doing, the injuries they are receiving, and the job training they are being given (Zierold et al., 2004). There is also almost non-existent data regarding the
issue of undocumented foreign youth workers and their particular characteristics. Considering the number of illegal aliens in this country, it is highly likely that there are a high number of undocumented youths working in a setting such as family businesses and in a variety of work settings especially agriculture and construction.

Further research that may be beneficial includes the causes of under-reporting of injuries and problems with correctly classifying youth fatalities and injuries as occupationally related, which would improve surveillance. Research is required to evaluate hazard elimination and reduction strategies and their effectiveness. A need also exists for a concise compilation of effective youth worker training programs in the U.S. For example, "a review of the various training programs out there for training young workers in the U.S. and Canada characterized by what they cover, how they are organized, and what their focus is" (C. Runyan, personal email, June 2005). There is a need to incorporate community and youths themselves as stakeholders in the planning processes for new initiatives to curtail occupational injuries. In addition, a need exists to better understand how social factors play a role in occupational hazards. Surprisingly, however, very little research has examined how various social factors impact youths' risk perceptions and injury at work (Westaby & Lowe, 2005).

In the review of literature, most studies did not provide a clear definition of youth and in fact, rarely noted the age parameters that they were describing. In several instances where researchers mentioned age ranges, the ranges varied widely. There should be clear definitions of categories of workers under the age
of 18 including standard age parameters. Documented occupational fatalities have been noted as young as 9 years; therefore the focus of prevention should ideally be centered on individuals from age 8-18 years of age. Perhaps this range could be divided and individuals from 8-12 years referred to as children, and individuals from 12-18 years referred to as youths. By assigning these descriptors with an age parameter would help organize research and surveillance efforts.

Nineteen year olds should be included as adults in research or surveillance activities as they are not covered under existing child labor laws. The term child labor laws is outdated and stems from a time in U.S. history when very young children worked in unregulated roles. Perhaps when young workers are better defined there can be a new term such as young worker laws or child and youth labor laws.

Another recommendation is for the U.S. government to consider re-assigning the regulation of the special population of young workers from the U.S. DOL’s Wage and Hour Division to OSHA. The Wage and Hour Division has been ineffective in reducing hazards for young workers. Within OSHA, there could be a sub-system dedicated to young workers with inspectors specifically trained in this field.

There should be mandatory laws which require employers to design bullet-proof work-stations for high risk retail jobs and/or require that youths not be employed in such settings at all. There should also be more training for young workers on workplace violence and best practices for responding to criminals at the time of robbery to prevent violence. Furthermore, there is too much variability
in child labor laws from state to state which can be confusing especially in a time when the average American family relocates, possibly to a different state every 3-5 years. Since states can make laws that are stronger or weaker than federal laws, even though the more stringent law takes precedence, this variance may contribute to confusion for employers.

Federal labor standards and regulations are not strict enough, are outdated, and are not efficiently enforced. There needs to be increased funding to the U.S. DOL from Congress to better address this problem. In addition, at the state level there should be increased funding for states that have OSHA offices earmarked for young workers. Until or unless there is a reassignment of a regulatory body for young workers, the U.S. DOL should put more effort into the area of youth workers by employing more experts to enhance their ability to incorporate sound recommendations from other stakeholders such as NIOSH and the American Public Health Association. The U.S. DOL’s lack of action in regards to NIOSH’s 2002 recommendations for improving the HOs demonstrates a lack of commitment to the problem of youth occupational injuries.

The U.S. DOL, OSHA, and NIOSH all have separate websites with overlapping information dedicated to young workers with different program names. These agencies should be encouraged to work collaboratively to streamline their websites into one site which can be linked through each agency’s site. Due to the number of youths under 14 years who are working in informal settings, perhaps the FLSA should be expanded to protect this sub-group since occupational fatalities have been reported for youths as young as 9 years old.
Even though homes are not generally regulated, family businesses should not be exempt from FLSA laws since findings indicate that a significant number of deaths and injuries occur in these very settings (Higgi...s, 2002; NIOSH, 2003b; Pickett et al., 2003).

The question remains, who protects youth workers. Realistically, it will require a collaborative effort among governmental agencies, employers, parents, schools, occupational and other health professionals, child advocacy organizations, and academic researchers to accomplish an improved health and safety atmosphere in the working world of youths.

**Future Implications**

Future implications for OEHNs include a need to strengthen advocacy for youth workers, increase collaboration with school nurses and other healthcare professionals, and increase involvement with future research. OEHNS can “play an effective role in improving and ensuring their (young workers) overall well-being” (West et al., 2005, p. 304). Vulnerable work populations such as youth workers should be part of the curriculum in OEHN academic training programs so that OEHN’s have a better appreciation of non-traditional working populations. AAOHN should provide a resource list of young worker training links, as well as self-study units in addition to their occasional articles about vulnerable populations. One established training program is the National Young Worker Safety Resource Center (YWSRC) which is a team project between U.C. Berkeley’s Labor Occupational Health Program (LOHP) and the Education Development Center, Inc. (EDC) in Massachusetts. This center provides support
including training and resource materials throughout the United States. Certification in young worker safety would further bolster the status of OEHNs who endeavor to work on this topic.

The future wellbeing of the nation depends upon the strength of today's youths. Prevention of young workers' occupational fatalities and injuries is an investment in tomorrow's work force. The current structure of Social Security which is based on a worker to retiree ratio, "pay as you go" system is dependent on a healthy labor pool. While youths may appear to be a small part of the work force, in fact their roles are more significant than once thought since they tend to take on jobs that are less desirable such as farm work, cashier jobs, and other service-related roles. Their absence in the work force would be felt in unexpected ways. Work can be a healthy and meaningful outlet for youths in today's world which is fraught with many stresses including but not limited to sexually transmitted diseases and school violence. One young worker death a year is too many, and yet we tolerate on average 1 young worker death every 5 days in this country. It is incumbent upon those who can make a difference to improve the conditions for working youths to do so.
REFERENCES


LIST OF APPENDICES

A: Hazardous Occupations Orders for Nonagricultural Work (HOs) ............... 73
B: Hazardous Orders for Agricultural Work (HO/As) ........................................ 75
C: American Academy of Family Physicians .......................................................... 78
Appendix A

Hazardous Occupations Orders for Nonagricultural Work (HOs)

The FLSA establishes age 18 as the minimum for those nonagricultural occupations that the Secretary of Labor finds and declares to be particularly hazardous for minors aged 16 and 17, or detrimental to their health or well-being. In addition, Child Labor Regulation No. 3 bans 14- and 15-year-olds from performing any work proscribed by the HOs.

HO 1. Manufacturing or storing explosives: bans minors working where explosives are manufactured or stored, but permits work in retail stores selling ammunition, gun shops, trap and skeet ranges, and police stations.

HO 2. Driving a motor vehicle or work as an outside helper on motor vehicles: bans operating motor vehicles on public roads and working as outside helpers on motor vehicles (except 17-year-olds may drive cars or small trucks during daylight hours for limited times and under strictly limited circumstances).

HO 3. Coal mining: bans most jobs in coal mining.

HO 4. Logging and sawmilling: bans most jobs in logging and timbering (including cutting firewood) and in sawmills.

HO 5. Power-driven woodworking machines: bans the operation of most power-driven woodworking machines, including chain saws, nailing machines, and sanders.


HO 7. Power-driven hoisting apparatus: bans the operation of most power-driven hoisting apparatus such as forklifts, nonautomatic elevators, skid-steer loaders, cranes, and high lift trucks, but does not apply to chair lifts at ski resorts nor to electric and pneumatic lifts used to raise cars in garages and gasoline service stations.

HO 8. Power-driven metal-forming, punching and shearing machines: bans the operation of certain power-driven metal-working machines but permits the use of most machine tools.

HO 9. Mining, other than coal: bans most jobs in mining at metal mines, quarries, aggregate mines, and other mining sites including underground work in mines, work in or about open cut mines, open quarries, and sand and gravel operations.
HO 10. Power-driven meat processing machines, slaughtering, and meat packing plants: bans the operation of power-driven meat processing machines, such as meat slicers, saws and meat choppers, wherever used (including restaurants and delicatessens). This ban includes the use of this machinery on items other than meat, such as cheese and vegetables. HO 10 also bans most jobs in slaughtering and meat packing establishments.

HO 11. Power-driven bakery machines: bans the operation of power-driven bakery machines such as vertical dough and batter mixers (including most countertop models), dough rollers and dough sheeters. This ban covers such machinery wherever used.

HO 12. Power-driven paper products machines: bans the operation of power-driven paper products machines such as scrap paper balers, paper box compactors, and platen-type printing presses. Sixteen- and 17-year-olds may load, but not operate or unload, certain scrap paper balers and paper box compactors under very specific guidelines.


HO 14. Power-driven circular saws, band saws, and guillotine shears: bans the operation of various types of power-driven band and circular saws and guillotine shears, no matter what kind of items are being cut by the saws and shears.

HO 15. Wrecking, demolition, and ship-breaking operations: bans most jobs in wrecking, demolition, and ship-breaking operations, but does not apply to remodeling or repair work that is not extensive.

HO 16. Roofing operations: bans most jobs in roofing operations including work performed on the ground and removal of the old roof.

HO 17. Trenching and excavation operations: bans most jobs in trenching and excavation work, including working in a trench more than four feet deep.

*School hours are determined by the local public school in the area where the minor is residing while employed (even if the minor does not attend the public school).

†The regulations provide a limited exemption for apprentices and student learners who are at least aged 16 and enrolled in approved programs.

‡Prohibited tasks also extend to setting up, adjusting, repairing, oiling, or cleaning the equipment.

Appendix B

Hazardous Orders for Agricultural Work [HO/As]

The Secretary of Labor has found that the following agricultural occupations are hazardous for workers under age 16. No worker under age 16 may be employed at any time in any of these hazardous occupations in agriculture (HO/A) unless specifically exempt, as noted. These prohibitions do not apply to workers of any age working on farms owned or operated by their own parent(s) or legal guardian(s).

**HO/A 1.** Operating a tractor of over 20 PTO (power-take-off) horsepower, or connecting or disconnecting implements or parts to such a tractor.

**HO/A 2.** Operating or helping to operate any of the following machines (operating includes starting, stopping, adjusting, or feeding the machine or any other activity involving physical contact with the machine):

(a) Corn picker, cotton picker, grain combine, hay mower, forage harvester, hay baler, potato digger, or mobile pea viner;

(b) Feed grinder, crop dryer, forage blower, auger conveyor, or the unloading mechanism of a non-gravity-type self-unloading wagon or trailer; or,

(c) Power post-hole digger, power post driver, or nonwalking-type rotary tiller.

**HO/A 3.** Operating, or assisting to operate any of the following machines (operating includes starting, stopping, adjusting, or feeding the machine, or any other activity involving physical contact with the machine):

(a) Trencher or earthmoving equipment;

(b) Fork lift;

(c) Potato combine; or,

(d) Power-driven circular, band, or chain saw.

**HO/A 4.** Working on a farm in a yard, pen, or stall occupied by a

(a) Bull, boar, or stud horse maintained for breeding purposes; or

(b) Sow with suckling pigs, or cow with newborn calf with umbilical cord present.
HO/A 5. Loading, unloading, felling, bucking, or skidding timber with a butt (large end) diameter of more than 6 inches.

HO/A 6. Working from a ladder or scaffold at a height of over 20 feet (working includes painting, repairing, or building structures, pruning trees, picking fruit, etc.).

HO/A 7. Driving a bus, truck, or automobile when transporting passengers, or riding on a tractor as a passenger or helper.

HO/A 8. Working inside:

(a) A fruit, forage (feed), or grain storage structure designed to retain an oxygen deficient or toxic atmosphere—for example, a silo where fruit is left to ferment;

(b) An upright silo within 2 weeks after silage (fodder) has been added or when a top unloading device is in operating position;

(c) A manure pit; or,

(d) A horizontal silo while operating a tractor for packing purposes.

HO/A 9. Handling or applying agricultural chemicals if the chemicals are classified under the Federal Insecticide, Fungicide and Rodenticide Act as Toxicity Category I—identified by the word “Danger” and/or “Poison” with skull and crossbones; or Toxicity Category II—identified by the word “Warning” on the label. (Handling includes cleaning or decontaminating equipment, disposing of or returning empty containers, or serving as a flagman for aircraft applying agricultural chemicals.)

HO/A 10. Handling or using a blasting agent including, but not limited to dynamite, black powder, sensitized ammonium nitrate, blasting caps and primer cord.

HO/A 11. Transporting, transferring, moving, or applying anhydrous ammonia (dry fertilizer).

*“Small” farm means any farm that did not use more than 500 “man-days” of agricultural labor in any calendar quarter (3-month period) during the preceding calendar year. “Man-day” means any day during which an employee works at least 1 hour.

†Student-learners in a bona fide vocational agriculture program may work in this hazardous occupation under a written agreement, signed by the student-learner, the employer, and a school authority, which provides that the student-learner’s work is incidental to training, intermittent, for short periods of time, and under
close supervision of a qualified person; that safety instructions are given by the school and correlated with on-the-job training; and that a schedule of organized and progressive work processes has been prepared.

Exemptions for 4-H Federal Extension Service Training Program and the Vocational Agriculture Training Program: Minors aged 14 and 15 who hold certificates of completion of either the tractor operation or machine operation program may work in the occupations [(HO/A1 and HO/A2, respectively)] for which they have been trained.

January 30, 2006

Karyn Jean Daguerre
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