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Work-Related Hazards and Workplace Safety of US Adolescents Employed in the Retail and Service Sectors

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ABSTRACT

OBJECTIVE. Our goal was to examine the hazard exposures, work experiences, and workplace safety training of adolescents employed in retail and service jobs in the United States.

METHODS. This was a cross-sectional telephone survey among working adolescents, 14 to 18 years old, in the continental United States. Data were collected in 2003. Survey items measured self-reported hazard exposures, training, and supervision experiences of working adolescents.

RESULTS. Teens reported working an average of 16.2 hours per week during the school year, including working an average of 2.9 times per week after 7 PM on school nights and 2.6 nights per week after 9 PM. Thirty-seven percent of those under age 16 reported working after 7 PM on a school night, indicating employer violation of federal law. Teens typically perform multiple kinds of tasks in a given job. Higher proportions of females than males are involved in cash handling (84% vs 61%), whereas males are more likely than females to be involved in physically challenging tasks, such as lifting heavy objects (57% vs 22%) or working at heights (35% vs 17%). Despite federal regulations prohibiting teens under 18 from using certain types of dangerous equipment (eg, slicers, dough mixers, box crushers, paper balers) or serving or selling alcohol in places where it is consumed, 52% of males and 43% of females reported having performed ≥1 prohibited task. Although more males reported receiving safety training, they were also more likely to report working without supervision than their female counterparts.

CONCLUSIONS. Teens are exposed to multiple hazards, use dangerous equipment despite federal prohibitions, and work long hours during the school week. They also lack consistent training and adult supervision on the job. It is important for adolescent medicine practitioners to become involved in prevention efforts through both anticipatory guidance and policy advocacy.

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Key Words
youth, adolescent workers, hazard exposures, workplace safety, retail and service sector jobs

Abbreviations
OSHA—Occupational Safety and Health Administration
CL— confidence limit

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In 2000, THE estimated labor force participation for 16- to 17-year-olds was 68.5% (75.3% for males and 62.1% for females), resulting in >6 million employed adolescents in the United States[1,2] Many teens, however, begin working before their 16th birthdays.[3] Once adolescents enter the labor market, they usually continue working, although they change jobs frequently.[4] Most working adolescents are employed during both the school year and the summer, with the proportions working during both periods estimated at 62% for 16- to 19-year-olds.[5,6] Estimates suggest that by the time they graduate from high school, most teenagers have had a job.[6] The largest proportion (62%) of adolescents work in retail trades, of which half are eating and drinking establishments, whereas the second largest number (25%) work in the service industry during school months. In the summer months, retail and services industries account for 50% and 30% of youth employment, respectively.[6]

Despite its benefits,[7] employment can have serious negative consequences for adolescents. Several studies document the magnitude of fatal injuries to young workers.[8–19] The Bureau of Labor Statistics reports fatality counts of work injuries among workers 17 years old and younger to be fairly stable between 1992 and 2000, with an annual average of 68 fatalities.[19]

Converting actual hours worked to full-time equivalency (because youth work part-time or for limited time periods) results in estimated fatality rates per 100 000 workers of 5.1 for 15-year-olds, 3.4 for 16-year-olds, and 3.7 for 17-year-olds.[17,18] Although these rates of fatal work-related injuries to teens are the same or slightly less than the rate for adults (5.1 per 100 000),[18] the number of injuries per hour worked may actually be greater for youth.

Injuries to youth in the retail trade and services sectors together accounted for 26% of the fatalities among workers 17 years old and under during the1998–2002 period.[19] For this period, 13% (40) of the 304 deaths to young workers were in the retail trades, and service industries accounted for another 13% of the documented young worker fatalities.[18] Homicides associated with robberies were reported to be the cause of between one fourth and one half of all youth fatalities in the retail trade.[17]

With regard to nonfatal work injuries, Layne et al[20] estimated that 64 100 youths between the ages of 14 and 17 were treated in emergency departments for occupational injuries in 1992 and National Institute for Occupational Safety and Health estimates that nearly 200 000 adolescents are injured at work every year.[21] A wide variety of data sources have been used to characterize nonfatal adolescent work-related injuries. Several studies used workers' compensation data to determine the incidence of nonfatal injuries to teen workers,[11,22–27] whereas others used first report of injury records[28] or focus groups and surveys of adolescents.[29–35] Data from the Survey of Occupational Injuries and Illnesses, an annual survey of employers' Occupational Safety and Health Administration (OSHA) recordkeeping logs conducted by the Bureau of Labor Statistics, reported 9000 cases of workers younger than age 17 with injuries and illnesses that resulted in days away from work in 2003. Approximately 25% of these cases were in retail trade, and 38% were in food services and drinking places.[19]

This study describes the self-reported work experiences of a national sample of employed adolescents, ages 14 to 17, working in the retail and service sectors. We documented employee hours of work, the tasks the youth perform, and the hazards that they face on the job, examining variations by gender and age. In addition, we explored their reported experiences with being trained and supervised. As such, this is the first national study, to our knowledge, to document the work-related hazards to which teens are exposed.

METHODS

Overview

This project used a nationally representative cross-sectional telephone survey to elicit information about work experiences from a sample of 14- to 17-year-old working teens.

Instrument Development

To develop our survey instrument, we conducted focus groups with teen workers to learn how they described workplace hazards,[35] reviewed teen worker injury reports obtained from the state of Massachusetts (Leticia Davis, ScD, verbal communication, 2002), and borrowed items from national surveys and from previous surveys of teens in North Carolina and in selected other sites.[29–32] We then sent the draft instrument for review to 7 national experts familiar with teen labor issues, making revisions before pretesting to clarify confusing questions and reduce the length of survey administration to ~25 minutes. We pilot-tested the instrument with 54 teens incorporating final modifications in preparation for interviewer training and final survey administration by the Survey Research Unit of the Department of Biostatistics at the University of North Carolina School of Public Health.

The Human Subjects Committee of the University of North Carolina School of Public Health reviewed and approved the instrument, as well as consent, assent, and interview procedures.

The final survey instrument, which was programmed into a computer-assisted system using Blaise,[36] consisted of 50 items, including categories addressing: business type and job tasks, work hours, and hazard exposures.

Sampling

A probability sample of households with telephone line access in the continental United States was chosen for this study. The sample was selected by using a dual-frame approach in which 10% of the sample was selected from a list-assisted random-digit dialing frame of households with telephones, and the remainder was chosen from a complementary (ie, nonoverlapping) targeted-list frame consisting of directory-listed residential telephone numbers for which recent demographic information about the household was available.

Screening and Eligibility

Once they reached a residential household with a working telephone number, interviewers determined the eligibility of the household by talking with a parent or guardian. A household was eligible to participate in the study if it had a teen between the ages of 14 and 18 who had held a job not supervised by a parent/guardian for at least a 2-month period within the preceding 12 months. In addition, the teen needed to be ≥ 14 years old but younger than 18 at the time he or she worked. If there was >1 eligible teen in the household, 1 was selected randomly to participate. We asked the parent to indicate all the eligible teens. Depending on how many eligible teens were in the household, we generated a random number from that number of possible numbers (ie, if 3 teens were present, we selected randomly number 1, 2, or 3). If "1" was generated, we selected the youngest eligible child. If "2" was generated, we selected the second youngest eligible child, and so on.

The parent or guardian gave consent before data collection could begin and then was typically interviewed for the parent part of the study (C.W.R., M.S., J.D., J.M.B., and R.A., unpublished data, 2003) before we asked to speak with the adolescent. The parent and the selected teen were each read statements explaining the study and confidentiality provisions and were asked to agree verbally to participate. Non–English-speaking households (n = 418), as well as households without telephones, were excluded from the study population. As part of the parent interview, we asked the parent to identify the most recent job meeting the eligibility criteria. This job selection was confirmed with the teen during the teen interview so that the teen's responses focused on 1 specific job during the entire interview.

Data Collection

Interviews took place 7 days a week between the months of February and September 2003. Selected numbers were called until a minimum of 10 unsuccessful attempts were made with at least 1 weekend call, 1 evening call, and 1 daytime call over a several-week period.

Data Management and Data Analysis

Raw sample weights were based on original probabilities of choosing households from the a national frame of telephone numbers, the total number of telephone lines reaching the household, and in the case of child and parent/child pairs, the number of eligible teens in the household. Trimming techniques based on Potter[37] were used to reduce the overall variability of raw weights. Weight variability inflates standard error of estimates, thereby decreasing the precision of point estimates (proportions or means) and reducing power to make comparisons. The trimming process reduced extreme weights, redistributing them among others so that the sum of the adjusted weights remained constant. Trimming procedures reduced the impact of weight variability on variance of estimates by ~80%. Poststratification adjustments were used to better align multivariate sample distributions on key demographic variables, with population distributions based on national sources. Sample proportions were adjusted to national estimates provided by the 2002 Current Population Survey.[38] Race of household head and household income were used as the poststratification variables.

Analyses showed here include actual frequencies of responses to key items and comparisons within age and gender strata. Percentages, 95% confidence limits (CLs), and means calculations rely on sampling weights.

RESULTS

Response Rate and Final Study Population

Telephone interviews were completed with 928 teenage workers. Using the American Association for Public Opinion Research Standard Definitions,[39] the range in response rates was 51% to 64%. The low-end response rate assumes that the same proportion of unknown eligibility households were eligible to participate as the proportion eligible with known status, and the high-end response rate (64%) assumes that all households contacted for which no eligibility information was available were considered not eligible for the participation in the survey.

Because 93% of the working teens surveyed in this study indicated that their most recent job meeting our eligibility criteria was in retail and service trades, the data presented in this article are restricted to that subset, a study group of 866 teen workers. This study population was 48% male, 85% white, and 3% Hispanic. Thirteen percent of the respondents reported on work experiences at jobs held over the previous year while they were under age 16, and the remaining 21% described experiences working as a 16-year-old and 67% as a 17-year-old.

Work Hours and Schedule

Teens worked at their referent job (ie, the job they had worked at the most during the previous 12 months) for

a median total period of 9 months (interquartile range: 11.0). During the school year, teens reported working a mean of 16.2 hours per week, with 82% of the working teens reporting having worked after 7 PM on a school night, 52% indicating they had worked after 9 PM, and 10% reporting they had worked after 11 PM. The average number of days spent working these hours on school nights also varied, with teens reporting working after 7 PM on average 2.89 nights per week versus working an average of 2.64 and 2.07 nights per week after 9 or 11 PM, respectively (Table 1).

Although not shown in the table, older teens (aged 16–17) were 3 to 4 times more likely to report working in the evening than were teens under age 16. However, 37% of those under age 16 reported having worked past 7 PM on a school night, a practice that is prohibited by the federal law for those under age 16.[40] In addition, 16% of these youngest workers (≤15 years) indicated they had worked after 9 PM on a school night.

Tasks Performed

Each teen was asked an open-ended question: "What tasks do (did) you do at this job?" Up to 5 responses to the question were coded. These tasks were categorized postinterview into 8 groups: (1) customer interaction and cash handling tasks (eg, cashiers, baggers, hostesses, and sales); (2) food preparation and food handling and serving tasks (eg, cooks, bartenders, waiters, and deli work); (3) cleaning and laundry tasks (eg, busing tables, dishwashing, laundering, and removing trash); (4) child and health care (eg, work in tending to children in day care or elders in nursing homes); (5) recreation, sports, and teaching (eg, coaching, refereeing, teaching sports, camp counseling, life guarding, and preparing golf carts for patrons); (6) driving and delivery (eg, food delivery, steering boats, or driving cars); (7) other manual tasks (eg, loading, stocking shelves, operating equipment, doing yard work, animal care, and repairing items); and (8) other, including office work (eg, filing, typing, and doing work on computers). Some responses were too vague to be classified and were coded as "unknown."

Overall, 17% of the teens listed just 1 task at their referent job, whereas 24% listed 2, an additional 24% reported 3 tasks, and 34% listed 4 or more tasks. As shown in Table 2, 31% of females and 24% of males reported a primary job task involving customer interaction or cash handling, and 30% of females compared with 20% of males indicated their primary task was preparing, handling, and/or serving food. Although not shown, responses to another question indicated that 84% of females and 61% of males indicated that they had ever been responsible for cash handling in this job, even if it was not their primary task. Males were more likely to identify primary tasks of doing cleaning and laundry work (18% of males vs 8% of females) or manual tasks such as loading trucks, stocking shelves, yard work, or assembling things (17% of males vs 7% of females). Higher proportions of males than females reported their primary task was recreation, sports, or teaching (12% of males vs 8% of females) whereas females were more engaged with child care as the primary task (5%) versus males (3%).

Because we were particularly interested in learning about hazards on the job that might lend themselves to remediation, respondents were asked about tasks specific to retail and service sector employment shown in previous studies to be potentially dangerous.[22,41] Items in Table 2 were asked of all respondents, whereas those in Table 3 were asked only of those 395 respondents who worked in grocery or food service establishments. It is important to note that in Table 2, the sample sizes and, therefore, stability of the estimates vary because we asked individual items only to those respondents working in establishments that had the specified type of equipment.

As shown in Table 2, close to 90% of teen workers reported performing cleaning tasks (as distinct from only the primary tasks). Among the more than three quarters

TABLE 1 **Work Hours During School Year of US Teens Working in Retail and Service Sectors, 2003 (*N* = 866)**

Characteristic	*n/N* (Not Weighted)	% (Weighted)	95% CLs (Weighted)
Have you worked when there is school the next day (ever)?	595/866	68.0	62.8, 73.3
Work after 7 PM on school night	487/595	82.3	77.1, 87.5
Work after 9 PM on school night	308/595	51.6	44.7, 58.5
Work after 11 PM on school night	66/595	10.1	6.9, 13.2
Frequency of work after specific hours on school nights, No. of times in an average week, mean (range)			
Work after 7 PM	2.89 (1–7)		2.67, 3.11
Work after 9 PM	2.64 (1–7)		2.34, 2.93
Work after 11 PM	2.07 (1–6)		1.61, 2.53
Typical No. of hours worked per week when school is in session, mean (range)	16.2 (1–40)		14.99, 17.33

TABLE 2 **Primary Tasks and Other Selected Experiences Reported by US Working Teens in the Retail and Service Sectors According to Gender, 2003 (*N* = 866)**

Working Conditions	Female, % (95% CLs)	Male, % (95% CLs)	Total, % (95% CLs)
Primary tasks ($n = 866$)			
Customer interaction, cash handling	31.4 (24.2, 38.6)	23.6 (17.3, 29.9)	27.7 (22.8, 32.5)
Food preparation, food handling, serving	30.3 (21.9, 38.6)	20.4 (13.7, 27.1)	25.5 (20.0, 31.0)
Cleaning and laundry tasks	8.0 (3.8, 12.1)	17.5 (10.1, 24.8)	12.6 (8.3, 16.8)
Child and health care	5.0 (2.6, 7.4)	2.7 (0.55, 4.8)	3.9 (2.3, 5.5)
Recreation, sports and teaching	8.1 (5.0, 11.2)	12.4 (8.7, 16.0)	10.2 (7.8, 12.5)
Driving and delivery	0.8 (0.0, 2.2)	1.2 (0.19, 2.2)	1.0 (0.1, 1.9)
Other manual tasks (eg, loading, stocking shelves, operating equipment)	7.2 (2.5, 11.9)	16.9 (11.1, 22.8)	11.9 (8.2, 15.7)
Other, including office work, work with computers	9.2 (5.5, 12.8)	5.3 (0.65, 9.8)	7.3 (4.4, 10.2)
Other experiences			
Motor vehicle present at workplace (ie, company motor vehicles that employees use as part of their job), females ($n = 90$); males ($n = 118$)			
Have you driven a motor vehicle as part of job?	22.5 (4.0, 40.9)	40.1 (24.3, 55.9)	32.1 (20.3, 44.0)
Lawnmowers present at workplace, females ($n = 76$); males ($n = 115$)			
Have you operated a lawn mower?	14.0 (0.0, 34.3)	19.9 (9.0, 30.8)	17.2 (6.4, 27.9)
Power equipment or tools present at workplace, females ($n = 162$); males ($n = 223$)			
Have you operated power equipment or tools?	31.0 (18.4, 43.6)	59.4 (49.1, 69.8)	47.4 (39.2, 55.7)
Forklift or any other power-driven lifting equipment present at workplace, females ($n = 57$); males ($n = 98$)			
Have you operated a forklift or other power driven lifting equipment?	6.1 (0.0, 14.6)	44.6 (28.4, 60.8)	28.6 (16.2, 41.0)
Heavy equipment or machinery such as that used in cleaning, landscaping, construction, or industrial work at present workplace, females ($n = 64$); males ($n = 116$)			
Have you operated heavy equipment, machinery for cleaning, landscaping, construction, or industrial work?	3.7 (0.1, 7.4)	26.6 (15.4, 37.8)	17.4 (10.4, 24.4)
Have you been an outside helper on a motor vehicle? Females ($n = 428$); males ($n = 438$)	7.2 (2.2, 12.1)	16.8 (9.5, 24.2)	11.8 (7.4, 16.2)
Have you…			
worked in high places (>6 ft)?	16.6 (10.7, 22.6)	35.4 (27.9, 42.8)	25.6 (20.8, 30.4)
worked in high places without fall protection?	28.7 (13.3, 44.2)	49.7 (36.8, 62.5)	42.6 (32.0, 53.1)
moved or lifted heavy objects (>50 lbs)?	22.1 (15.4, 28.7)	57.0 (49.1, 64.8)	38.8 (33.2, 44.3)

TABLE 3 **Percentages of US Working Teens Reporting Specific Activities in Grocery Stores or Food Service According to Gender, 2003 (*N* = 395)**

Work Activities	Female ($n = 191$), % (95% CLs)	Male ($n = 204$), % (95% CLs)	Total ($N = 395$), % (95% CLs)
Used sharp knives	67.7 (55.4, 80.0)	74.9 (64.8, 85.0)	71.2 (63.1, 79.3)
Used case cutter, box knife, or razor blades	59.3 (47.8, 70.9)	77.3 (67.6, 87.0)	68.2 (60.5, 76.0)
Used grills or ovens	53.6 (41.7, 65.5)	55.6 (43.8, 67.4)	54.6 (46.2, 62.9)
Used deep fat fryer	36.0 (23.7, 48.4)	36.7 (25.9, 47.5)	36.4 (28.1, 44.6)
Used power slicing tool or grinder[a]	15.8 (8.1, 23.5)	19.3 (10.0, 28.6)	17.5 (11.5, 23.5)
Sold or served alcohol at places where alcohol is consumed by customers[a]	17.0 (5.9, 28.1)	12.7 (3.6, 21.7)	14.9 (7.6, 22.1)
Used steam table	15.2 (5.9, 24.6)	12.0 (6.6, 17.4)	13.7 (8.1, 19.2)
Used box crusher[a]	6.2 (1.5, 10.8)	21.4 (11.2, 31.7)	13.6 (7.8, 19.3)
Used dough mixing or rolling machine[a]	7.2 (2.7, 11.8)	16.3 (7.2, 25.5)	11.7 (6.5, 16.8)
Used baler or compactor[†]	4.9 (1.2, 8.6)	17.6 (10.2, 25.0)	11.1 (7.0, 15.2)
Used food wrapping machine	4.1 (1.6, 6.6)	16.5 (7.2, 25.8)	10.1 (5.2, 15.0)
One or more prohibited tasks reported[a]	43.2 (31.1, 55.2)	51.9 (40.0, 63.0)	47.4 (38.9, 55.9)
Mean number of above hazards reported	2.8 (2.4, 3.3)	3.6 (3.1, 4.1)	3.2 (2.9, 3.6)

[a] These activities are prohibited by federal law for workers <18 years of age. State laws vary and may have additional prohibitions.

of the teens who worked in places with cash registers, the majority were engaged in cash handling, with figures of 84% for females and 61% for males. More than half of the male teens compared with 22% of the females reported having lifted >50 pounds while at work. Similarly, males were more likely than females to work at heights >6 feet (35% vs 17%) and without use of fall protection (50% vs 29%).

Hazard Exposures and Illegal Tasks

Table 3 reports information about the 395 youth working in groceries or food service establishments. Among

these teens, more than two thirds reported using sharp knives (71%) or using case cutters, box knives, or razor blades (68%). Over half had used grills or ovens, and 36% had used deep fat fryers. Male workers reported higher exposures to all these hazards than female workers. Four types of injury hazards listed are explicitly prohibited by federal law for any worker under age 18: operation of box crushers, operation of balers or compactors, operation of a power slicing tool or grinder, and operation of dough mixers. A fifth, selling or serving alcohol where it is consumed, is also included. More than half (52%) of all male workers and 43% of female workers reported having performed ≥1 of these 5 federally prohibited tasks.

Training and Supervision

Overall, two thirds of the respondents indicated they had received some type of safety training (Table 4). The reported content of the training varied. Most of the teens reported that they were taught about using equipment safely and how to avoid getting hurt while working. Fewer teens indicated they had received training related to violence, with fewer than half reported having been taught what to do in the event of a robbery. Higher proportions of females than males report training for robbery, angry customers, and threats of attack.

We asked several questions about supervisory practices. More than 60% of teens reported that someone checked to make sure they were doing their work correctly at least once a day. In addition, we asked the question: "In a typical work week while working at [referent job], how many days do (did) you work some or part of the day without an adult supervisor (age 21+ years) at the worksite?" In response, 22% of the females and 30% of the males reported that in a typical week they worked without adult supervision ≥1 day. Although not shown in Table 4, 19% of teen workers reported working without supervision ≥2 days per week.

Previous studies identify robbery and workplace violence as major risks associated with working in retail settings.[41–44] Therefore, we asked questions about working alone during daylight and/or evening hours. Approximately 10% indicated they had worked alone for ≥ 1 day at their referent job during the past year during daylight hours, and 9% percent indicated that they had worked alone after dark (for at least half an hour) ≥1 day a week (Table 4). Although not shown in Table 4,

TABLE 4 **Training and Supervision by Gender, 2003 ($N = 866$)**

	Female ($n = 428$), % (95% CLs)	Male ($n = 438$), % (95% CLs)	Total ($N = 866$), % (95% CLs)
Training and training content			
Have you received any kind of safety training?	61.1 (53.3, 68.8)	72.4 (66.0, 78.8)	66.5 (61.3, 71.7)
Training addressed	($n = 258$)	($n = 317$)	($n = 575$)
How to avoid getting hurt while working	86.4 (80.9, 91.9)	82.2 (73.4, 90.9)	84.1 (78.9, 89.5)
How to use equipment safely	90.0 (85.3, 94.6)	93.2 (89.7, 96.7)	91.7 (88.8, 94.5)
What to do in case of robbery	44.1 (33.8, 54.4)	37.7 (28.2, 47.3)	40.8 (33.7, 47.9)
How to deal with angry or drunk customer	65.0 (55.5, 74.6)	56.3 (46.3, 66.4)	60.5 (53.5, 67.5)
How to deal with arguments or fights among coworkers	64.6 (55.6, 73.6)	62.3 (53.2, 71.3)	63.4 (57.0, 69.8)
What to do if sexually harassed	66.0 (57.1, 74.9)	60.8 (51.3, 70.3)	63.3 (56.7, 69.8)
What do if attacked or threatened	63.3 (53.6, 72.9)	58.6 (48.7, 68.5)	60.9 (53.9, 67.8)
Supervision			
How many days did you work without adult supervisor at the worksite?			
None	78.5 (72.7, 84.2)	70.0 (62.3, 77.7)	74.4 (69.6, 79.3)
≥1	21.5 (15.8, 27.3)	30.0 (22.3, 37.7)	25.6 (20.7, 30.4)
How many days were you the only person at worksite during daylight hours?			
None	89.1 (84.9, 93.4)	91.8 (88.4, 95.2)	90.4 (87.6, 93.2)
≥1	10.9 (6.6, 15.1)	8.2 (4.8, 11.6)	9.6 (6.8, 12.4)
How many days were you the only worker at the worksite after dark for at least half an hour?			
None	92.0 (88.3, 95.7)	89.1 (82.8, 95.3)	90.6 (87.0, 94.2)
≥1	8.0 (4.3, 11.7)	10.9 (4.7, 17.2)	9.4 (5.8, 13.0)
How often, if ever, has anyone checked to make sure you were doing your work correctly?			
More than once a day	36.2 (27.8, 44.5)	40.2 (32.1, 48.4)	38.1 (32.3, 43.9)
Once a day	25.6 (19.0, 32.3)	25.1 (18.9, 31.4)	25.4 (20.8, 29.9)
At least once a week, but not every day	22.1 (15.9, 28.4)	22.9 (16.0, 29.7)	22.5 (17.9, 27.1)
Less than once a week	11.4 (7.6, 15.1)	4.9 (2.7, 7.3)	8.3 (6.1, 10.6)
Never	3.5 (1.0, 6.0)	6.5 (1.8, 11.2)	4.9 (2.3, 7.5)
It varies	1.2 (0.0, 2.8)	0.3 (0.0, 0.7)	0.8 (0.0, 1.5)

15% of workers reported having worked alone in 1 or both of these circumstances (daytime or night hours) for ≥1 day a week.

DISCUSSION

Overview

Adolescents' formal employment for wages begins at an early age and, on average, teens in retail and service settings keep their jobs for nearly a year. Teens' work hours vary between school year periods and school vacations, with teens working nearly twice as many hours per week during school vacations.[6] Older teens and males are exposed to more hazards than younger or female workers. However, by virtue of being more heavily involved in cash handling, females are exposed to the risks associated with robberies.

In addition, many teens work at night on school nights, including some who indicated that they worked after 11 PM on a school night. This suggests the potential for interference with school or sleep, as well as potential for exposure to workplace violence that is more prevalent in the retail and service sectors than in other settings.[41,43–47] For teens younger than 16 years of age, working after 7 PM on school nights is illegal[40] and suggests the need for better enforcement of child labor laws. Although teen worker fatalities are less common in the retail and service sectors than in other sectors, nonfatal injuries in these sectors are common.[19] The data from this survey confirm that teens employed in these jobs are exposed to a variety of hazardous tasks, tools, and situations.

Teen work is complex. Workplaces in full compliance with OSHA regulations and standards for ensuring a safe work environment may still place young workers at risk for injury and illness. Federal and state child labor laws are designed to impose additional restrictions to protect teens from hazardous work environments or late work hours. As suggested by our data, many teens are performing tasks that are prohibited by current federal child labor laws. Our results also suggest gaps in both safety training and supervision of working teens because approximately one third of the teens reported not receiving any safety training. Among those who received safety training, training was lacking in some critical areas, such as training on what to do in case of robbery or on how to deal with arguments or fights among coworkers.

Although the efficacy of supervision and training is not well studied, it has been demonstrated that workers working alone are at greater risk of workplace homicide.[46,47] Plus, it is likely that greater supervision and training in difficult situations that arise in retail and service sector jobs would benefit adolescents who may lack the life experiences and judgment to develop appropriate strategies to deal with complex situations. The fact that so many teens reported working ≥1 day a week without adult supervision suggests the potential for serious lapses in safety.

Limitations

Because this is the first national study, to our knowledge, to interview working teens in the United States about their hazard exposures, there are few points of comparison. Rothstein[48] reports that the rates of employment among minority youth are lower than for white teens. Most likely, we have missed immigrant teenagers, particularly those who are undocumented both because of limiting our interview to those parents and teens who can speak English and because of a possible lack of receptivity of these families to agree to be interviewed. In addition, youth working in agriculture or in informal sector jobs (eg, working as a day-laborer or for a relative) were not included.

In addition, we can not assess the validity of responses that could be biased because of participant recall. The survey relied on self-report of job tasks and hazard exposure. This is a potential source of bias because of problems of recall and lack of accurate measurement of the number of times a particular hazard exposure may have occurred. We attempted to minimize recall problems by asking respondents to focus on a single, referent job throughout the interview. Although we can not be sure, we suspect that recall biases are conservative in underrepresenting the true prevalence of hazard exposure.

Finally, although this is the largest study of its kind to date, the sample size is limited, and CLs around some estimates are wide.

Implications for Future Research and Intervention

The literature on teen labor is relatively sparse and derives from several distinct fields, including youth development, public health, sociology, education, and organizational psychology. Little appears in the medical literature. It is important to integrate the findings from these distinct perspectives and devise more comprehensive intervention approaches that reflect the full state of knowledge so as to guide both clinical practice with working teens, as well as community advocacy. Although adolescents use health care less than people in other age groups, young people between 15 and 24 made >70 million estimated outpatient visits in 2004, with 79 visits for preventive care among every 100 persons.[49] As a result, there is considerable opportunity for pediatricians to interact with them around work-related issues.

Physicians should also be familiar with the youth labor laws in their locales so they can help their adolescent patients and their parents make wise decisions about jobs. In addition, knowing about the working environments of these youth may help physicians gain insight into other adolescent health and behavioral con-

TABLE 5 **Resources for Additional Information**

Federal Network for Young Workers Safety and Health (www.cdc.gov/niosh/fedNET)
US Department of Labor, OSHA Teen Workers Safety and Health Page (www.osha.gov/SLTC/teenworkers/index.html)
Occupational Health Surveillance Program, Massachusetts Department of Public Health Teens at Work Surveillance and Prevention Project (www.state.ma.us/dph/bhsre/ohsp)
Labor Occupational Health Program, UC Berkeley, Young Workers' Health and Safety (http://ist-socrates.berkeley.edu/~safejobs)
National Council for Occupational Safety and Health (www.coshnetwork.org/english_resources.htm)
National Consumer's League: Child Labor Coalition (http://nclnet.org/childlabor)

cerns, such as fatigue, school performance, and peer interactions. Special attention is warranted when youth are working long, late hours, without adequate adult supervision or with minimal training. Adding information about teen worker rights and responsibilities to standard patient care is one way that pediatricians can begin to inform both parents and teens about the potential hazards of youth work to both health and educational performance. Excellent information is available from the federal government, state agencies, and nonprofit organizations. Several useful Web sites appear in Table 5.[50–55]

In addition, individual clinicians and professional organizations should develop the skills and practice of engaging with other health professionals in addressing the policy issues surrounding young worker safety as they have successfully done in other aspects of child and adolescent health and safety, including regulations for fire safe sleepwear, poison prevention packaging, regulation of unsafe infant products such as infant walkers, child passenger safety, and graduated driver licensing for teens[56–61] Working conditions for teens can include many hazards, some of which are addressed by federal or state child labor policies or by OSHA regulations and some that are not. Even when policies govern safety, implementation is sometimes incomplete,[62] suggesting the need for not only careful monitoring of the policies themselves but also of improvements in policy implementation and enforcement, as with drunk driving laws or policies governing weapon carrying at school or graduated driver's licensing.

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