

Health Indicators Among Unemployed and Employed Young Adults

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Objective: Research on the prevalence of health indicators by employment status among young US adults is limited. **Methods:** We analyzed data from a nationally representative sample of young adults aged 18 to 24 years to document the prevalence of five health behaviors (cigarette smoking, risky drinking, leisure-time physical activity, and fruit and French fries consumption) by employment status. **Results:** Unemployed young adults reported higher levels of risky drinking and nonengagement in leisure-time physical activity, while employed young adults had higher levels of smoking, French fries consumption, and low fruit/vegetable consumption. Transportation/material-moving young adult workers reported the highest level of risky drinking (13.5%), and precision production/craft/repair workers reported the highest smoking rates (39.7%). **Conclusions:** We found an elevated prevalence of risk factors, which places young workers at increased risk for the development of chronic conditions later in life.

Life experiences and circumstances can influence a young person's ability to acquire, maintain, and sustain good health and well-being.¹ Research has shown that experiences and exposures across the life course, particularly early on, have long-term implications for health and may be one of the root causes of health inequality in later life.² Inequalities in socioeconomic status have been shown to be of key importance to the health of young adults as measured by a wide range of indicators, including morbidity, psychosomatic and somatic illness, employment conditions and occupation, perceived health, and mortality.³⁻⁵ Nevertheless, there is little research done on the impact of employment status and occupational inequalities in young adults. Early adulthood is a period when young people seek and obtain growing independence from their parents often through employment opportunities.⁶⁻⁹ Thus, during this period, examining health-risk behaviors that can potentially influence a young adult's health state, possibly altering his or her future adult life, is important.

The concept of "health risk" has been used to describe behaviors and health indicators with potentially negative effects on health, such as substance use, risky drinking, and eating disorders.¹⁰⁻¹⁴ Studies have shown that young adult workers in the United States are engaging in a range of health behaviors that increase their likelihood of future adverse health outcomes.¹⁵⁻¹⁷ Documenting major

health indicators relevant to the major fundamental causes of morbidity and mortality, specifically during a life stage when many adult health behavior patterns are forming, is critical to both identifying and preventing potentially deleterious health conditions in the future. For example, a national Canadian study of workers has shown that young men who were obese were more likely to report greater work absenteeism than their older counterparts.¹⁸⁻²¹

Despite the growing evidence that early unhealthy behaviors may lead to negative health conditions,²²⁻²⁷ there have been remarkably few large-population-based US health studies of young adult workers. Describing differences in select major *Healthy People 2010* indicators and behaviors among employed and unemployed young adults may shed additional insight into the association between employment status, occupation type, and healthy worker effect. Seeds of occupational health disparities documented by researchers now could take root in these early years when workers adopt unhealthy lifestyles. In the present study, we document the prevalence of select health indicators and behaviors among employed and unemployed young adults, as well as examine the relationship between occupation type and five major health behaviors using a nationally representative sample of young adults. We hypothesized that employed young adults would report lower levels of negative health behaviors than their unemployed counterparts.

METHODS

Data Source

We pooled data from the 1997 to 2004 National Health Interview Survey (NHIS), an annual cross-sectional population-based survey of the health of civilian noninstitutionalized US residents.²⁸ Interviews were conducted in-person by trained interviewers. In the family-core component, information was collected on sociodemographic characteristics, health status and conditions, and health behaviors for all members of the household. In the sample adult-core component, one adult household member was randomly selected to provide more detailed personal health and employment information. Annual response rates to the 1997 to 2004 adult-core survey ranged from 70% to 80%.²⁹⁻³⁵

Study Sample

We selected all respondents aged 18 to 24 years during the study period. If employed during the study period, these young adults also reported on their occupation for the week prior to interview and were grouped into 13 major occupational group classifications.³⁶ The final sample, inclusive of employed and unemployed young adults for this study period, was 27,010 representing an estimated annual number of 26,649,129 young US adults.

Health Indicator Variables

Smoker status was assessed by the following two questions: (1) "Have you smoked at least 100 cigarettes in your entire life?"; and (2) "Do you now smoke cigarettes every day, some days, or not at all?" Smoking status was coded as "current smoker" versus

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“former/never smoker.” *Risky drinking* was defined as 10 or more drinks per week in men, and 7 or more drinks per week in women, or 5 or more drinks at one sitting, 1 or more times in a year³⁷; young adults meeting this definition were coded in the affirmative as “risky drinkers.” Self-reported height and weight measures were utilized to calculate body mass index. Respondents were coded as “obese” if they had a body mass index value of 30.0 kg/m² or more.³⁸ We defined *leisure-time physical activity* (LTPA) levels as those young adults who engaged in either “light-moderate” physical activity [classified as > 30 minutes > 5 times per week], “vigorous” physical activity (>20 minutes > 3 times per week), or young adults who qualified for both activity categories.³⁹

Among the subpopulation of the 2000 NHIS young adults who also participated in the 2000 NHIS cancer supplement, the prevalence of fruit consumption based on US dietary guidelines (2 to 4 servings a day of fruit) was coded into a variable from NHIS question, “How often did you eat FRUIT? Count fresh, frozen, or canned fruit. Do not count juices.” Using the same NHIS cancer supplement, French fries consumption was ascertained by asking participants if they consumed 3 or more times per week, “How often did you eat French fries, home fries, or hash brown potatoes?” (dichotomized into a variable from NHIS question). Both the fruit and French fries consumption variables were evaluated (fruit, *n* = 2197, and French fries, *n* = 1823).

Self-rated health and functional limitations were included as additional control measures in multivariable analyses examining predictors of our five health indicators listed earlier. Self-rated health was based on a single item; we dichotomized these responses into fair/poor versus good/very good/excellent. Functional limitations for nine activities were assessed in the NHIS: walking, climbing, standing, sitting, stooping, carrying, pushing, grasping, and reaching. Participants were coded as having physical limitations (vs no limitations) if they indicated any level of difficulty with any of these activities.

Statistical Analysis

First, prevalence estimates for the five health indicators are calculated by demographic characteristics within employment status categories and within occupation type. Unknown values (ie, responses coded as “refused,” “not ascertained,” or “don’t know”) were not counted in the denominators when calculating estimates. Next, logistic regression models for smoking, drinking, and nonengagement in LTPA as dependent variables were undertaken (our fruit and French fries consumption measures were not included because of small sample size). For the occupational independent variable, the group with the healthiest prevalence estimate for each model outcome (smoking, drinking, and nonengagement in LTPA) was selected as the reference group. For example, in the logistic regression model, where smoking status was the outcome, young adults employed as professional specialty workers were set as the reference group, given that they had the lowest smoking estimate (15.5%) as compared with other occupational groups. Logistic regression analyses were adjusted for gender, race (black, white, or other), and obesity status (healthy weight vs obese). Obesity was included as a potential confounder, given the evidence of the associations between obesity, smoking, drinking, and physical activity.^{40–42} We list both the unadjusted and adjusted estimates for each of the three models.

Because of the complex sample survey design, weighted analyses were completed with adjustments for the design effects using SAS and SUDAAN.⁴³ To enhance the precision of estimates, data were pooled over the years 1997 to 2004. For pooled estimates, sample weights were adjusted to account for the aggregation of data over multiple survey years by dividing the original weight by 8 (the number of years combined in NHIS years 1997 through 2008).⁴⁴ The study protocol was approved by the institutional review board of the University of Miami.

RESULTS

There were a total of 10,102 unemployed young adults (representing an estimated annual 9,749,452) and 16,908 employed young adults (representing an estimated annual 16,899,677 young workers) participating in the 1997 to 2004 NHIS. Overall, 61.2% unemployed versus 60.3% employed did not engage in LTPA; 24.2% unemployed versus 28.2% employed currently smoked; 9.1% unemployed versus 8.2% employed engaged in risky drinking; 88.6% unemployed versus 90.1% employed were not eating the recommended two or more servings of fresh fruit per day; and 36.1% unemployed versus 39.1% employed consumed three or more servings of French fries per week (Table 1).

Young workers employed in transportation and material-moving occupations reported greater risky drinking (13.5%), while those in protective-service occupations reported the least risky drinking (3.7%). Smoking rates were highest among precision production, craft, and repair workers (39.7%) but lowest among professional specialty workers (15.5%). Young adults employed as machine operators, assemblers, and inspectors reported the highest levels of nonengagement in LTPA (68.7%) compared with protective-service occupation workers (37.3%) who reported the lowest. Young adult workers employed in transportation and material-moving occupations (95.6%) were more likely to fail to meet the US dietary guideline criteria for fruit consumption than those employed as technicians and related support occupations (85.4%), while Hispanic technicians and related occupations (85.4%) and black protective-services youth workers (91.2%) were most likely to consume three or more servings of French fries per week.

Occupational Results for the Unadjusted Logistic Regression Models

In the univariate logistic regression model (Table 2), young adults employed in precision production, craft, and repair occupations were most likely to report being a current smoker than those young adults employed in professional specialty jobs (odds ratio [OR]: 3.59; 95% confidence interval [CI]: 2.90 to 4.43). Nevertheless, in relation to professional specialty workers, the odds of smoking were significantly elevated for all other worker groups except technicians and related support workers (ORs: 1.59 to 3.44). Young adults employed in transportation and material-moving jobs had the highest odds of risky drinking relative to protective-service workers (OR: 3.47; 95% CI: 2.63 to 4.57); blue-collar, sales, and service workers also had significantly elevated rates of risky drinking (ORs: 2.33 to 3.44). Machine operators, assemblers, and inspectors had the highest rates of nonengagement of LTPA relative to protective-service workers (OR: 3.70; 95% CI: 2.60 to 5.27). In addition, all other worker groups had rates on nonengagement of LTPA, which were significantly higher than that of protective-service workers (ORs: 1.81 to 2.78).

Smoking Status Model

In the multivariable model with adjustment for gender, race/ethnicity, obesity status, self-rated health, and functional-limitations status (Table 2), the odds of smoking was highest among young adults employed as machine operators, assemblers, inspectors as compared with young adults employed in professional specialty occupations (adjusted odds ratio [AOR]; 3.90; 95% CI: 3.09 to 4.93). Similar patterns of significantly elevated smoking rates in all other occupational groups noted in the univariate analyses were also found to be significantly elevated in the adjusted analysis (range of AORs: 1.76 to 3.72). Young adults of black, other, and Hispanic race/ethnicity versus white young adults were significantly less likely to report being a current smoker (OR: 0.42, 95% CI: 0.37 to 0.49); OR: 0.73, 95% CI: 0.58 to 0.93; and OR: 0.45, 95% CI: 0.40 to 0.51), respectively. Young male adults (OR: 1.17, 95% CI: 1.06 to

TABLE 1. Individual Health Indicators by Youth 18–24 yrs of Age in 13 Major Occupational Groups and Those Unemployed: NHIS 1997–2004

13-Level Major Occupational Groups	Population Estimate*	Sample n*	% Nonengagement in Leisure-Time		% Risky Drinkers	% Not Eating ≥ 2 Servings of Fruit/Day†	% > 3 Servings of French Fries/Week‡
			Physical Activity	% Smokers			
Unemployed youth	9,749,452	10,102	61.2	24.2	9.1	88.6	36.1
Male	4,454,261	4,029	52.3	26.6	11.8	90.2	46.3
Female	5,295,191	6,073	68.8	22.1	6.1	87.2	26.6
White	6,948,230	7,054	59.1	26.9	10.0	88.0	34.8
Black	1,845,480	1,945	65.9	16.8	4.9	90.1	43.9
Other	955,743	1,103	67.1	18.4	7.0	89.6	30.4
Non-Hispanic	8,096,765	7,451	59.2	26.2	9.5	89.2	37.7
Hispanic	1,652,688	2,651	71.2	14.2	6.0	85.5	27.3
Total for all employed youth	16,899,677	16,908	60.3	28.2	8.2	90.1	39.1
Male	8,877,300	8,221	55.5	30.8	10.2	91.3	48.4
Female	8,022,377	8,687	65.7	25.3	5.7	88.9	29.8
White	13,774,880	13,313	58.9	30.3	8.8	90.2	38.7
Black	1,966,631	2,235	67.5	16.9	3.0	90.1	37.2
Other	1,158,166	1,360	65.2	22.7	7.7	89.1	45.6
Non-Hispanic	14,343,081	13,002	58.4	29.8	8.4	89.9	39.2
Hispanic	2,556,596	3,906	71.1	19.4	7.1	91.2	38.4
Specific occupation type							
Administrative support occupations including clerical	2,646,774	2,810	62.3	22.5	6.2	91.1	30.3
Male	734,865	716	53.8	24.2	8.4	89.0	46.0
Female	1,911,908	2,094	65.6	21.9	5.3	92.0	23.7
White	2,098,005	2,141	62.1	25.6	7.1	90.7	29.0
Black	376,936	445	64.6	9.4	2.0	94.2	36.6
Other	171,833	224	59.6	13.8	1.7	87.3	28.0†
Non-Hispanic	2,290,115	2,199	60.8	23.8	6.7	90.8	31.2
Hispanic	356,659	611	71.8	14.6	2.7	93.9	23.3
Professional specialty	1,476,241	1,581	51.8	15.5	5.6	88.5	27.5
Male	625,302	634	47.2	16.5	8.1	91.8	52.0
Female	850,940	947	55.2	14.8	3.8	86.8	18.6
White	1,256,139	1,293	50.2	16.2	6.0	88.4	25.9
Black	116,246	156	59.3	7.9	2.0	85.3‡	37.0‡
Other	103,856	132	62.9	15.9	3.4	92.1‡	42.0‡
Non-Hispanic	1,374,879	1,415	51.0	15.9	5.5	88.5	26.9
Hispanic	101,363	166	63.2	9.5	7.4	88.4‡	35.9‡
Executive, administrative managerial	1,043,824	1,128	56.0	26.8	7.2	93.5	37.2
Male	463,314	456	49.7	25.1	7.7	98.9	51.7
Female	580,510	672	61.1	28.1	6.7	90.6	29.3
White	860,052	884	54.6	29.2	7.3	93.1	38.4
Black	107,632	145	63.3	9.7	3.0	92.2‡	23.5‡
Other	76,140	99	61.6	23.9	10.2	97.7‡	44.2‡
Non-Hispanic	933,233	949	54.9	27.9	7.1	93.6	34.6
Hispanic	110,591	179	65.1	17.4	8.1	92.4‡	63.5
Sales	2,716,523	2,666	62.3	24.5	8.1	87.6	42.6
Male	1,131,974	995	50.5	25.7	10.1	92.9	49.9
Female	1,584,549	1,671	70.8	23.7	6.3	83.6	37.7
White	2,098,391	2,001	59.5	26.8	9.0	86.3	41.5
Black	390,056	434	72.8	14.2	2.3	93.1	31.8
Other	228,076	231	71.0	21.2	5.1	90.3‡	57.0

(Continued)

TABLE 1. (Continued)

13-Level Major Occupational Groups	Population Estimate*	Sample n*	% Nonengagement in Leisure-Time			% Not Eating ≥ 2 Servings of Fruit/Day†	% > 3 Servings of French Fries/Week‡
			Physical Activity	% Smokers	% Risky Drinkers		
Non-Hispanic	2,337,258	2,085	61.4	25.6	8.1	87.4	43.2
Hispanic	379,265	581	68.5	17.6	7.5	88.3‡	38.5
Precision production, craft, repair	1,583,934	1,476	61.4	39.7	11.6	89.4	46.4
Male	1,475,713	1,346	60.0	39.2	12.2	88.5	47.0
Female	108,221	130	80.1	46.3	1.4	97.5‡	42.0‡
White	1,390,533	1,265	60.2	41.5	11.9	91.2	47.6
Black	108,743	99	70.5	21.6	2.8	79.1	25.2‡
Other	84,658	112	69.7	32.1	16.2	84.4‡	53.5
Non-Hispanic	1,252,570	1,012	57.7	43.4	12.0	87.6	51.3
Hispanic	331,364	464	74.4	25.7	9.3	95.4	29.0
Service occupations, except protective/household	3,260,741	3,226	63.2	33.1	8.2	89.7	41.8
Male	1,310,724	1,192	56.9	35.1	10.2	90.3	47.6
Female	1,950,017	2,034	67.4	31.8	6.8	89.2	37.5
White	2,616,654	2,500	61.3	35.4	8.5	89.7	42.8
Black	411,951	470	70.0	21.9	4.5	89.5	60.6
Other	232,136	256	72.1	27.3	8.3	88.8	49.4
Non-Hispanic	2,770,790	2,504	61.6	35.2	8.6	89.3	40.3
Hispanic	489,951	722	71.9	21.2	5.1	91.9	51.2
Machine operators, assemblers, inspectors	898,235	868	68.7	38.7	11.6	92.3	45.6
Male	643,931	578	63.6	44.4	13.0	92.0	55.0
Female	254,305	290	81.7	24.2	5.9	93.0	25.2
White	726,246	665	67.2	42.0	11.8	95.9	44.0
Black	113,599	132	76.2	25.3	3.5	85.2‡	59.4
Other	58,390	71	73.7	23.6	22.8‡	73.6‡	40.1‡
Non-Hispanic	708,807	600	66.9	43.5	10.6	94.7	46.3
Hispanic	189,428	268	75.6	20.6	16.3	77.7‡	41.7‡
Transportation/ material moving	476,291	436	59.1	38.3	13.5	95.6	56.3
Male	436,794	388	58.6	38.0	13.8	95.3	58.6
Female	39,497	48	64.6‡	41.0	8.8	100.0‡	‡
White	405,295	360	58.9	40.4	14.4	95.2	54.0
Black	44,392	48	64.5‡	29.2	3.9	100.0‡	100.0‡
Other	26,604	28	53.0‡	21.2‡	14.6	100.0‡	83.14
Non-Hispanic	397,424	331	59.3	41.5	13.8	94.9	55.4
Hispanic	78,867	105	57.9	22.2	12.0	100.0‡	64.2‡
Handlers, equipment cleaners, helpers, laborers	1,374,890	1,223	57.0	29.3	9.1	90.1	40.6
Male	1,192,526	1,031	56.3	28.2	9.4	90.7	42.6
Female	182,363	192	61.9	35.9	7.4	86.7‡	29.9‡
White	1,113,951	982	56.5	31.1	9.8	89.2	40.5
Black	178,335	152	62.4	21.2	5.0	91.3‡	48.5‡
Other	82,604	89	53.2	22.5	8.0	95.5‡	31.5‡
Non-Hispanic	1,099,642	830	53.1	31.2	9.7	90.5	40.6
Hispanic	275,248	393	72.4	21.5	6.9	88.0	40.7
Technicians/related support	564,234	596	58.9	17.8	5.5	85.4	34.1
Male	268,780	265	58.7	16.9	6.0	88.3	47.6
Female	295,455	331	59.1	18.5	5.1	82.7	22.2‡
White	472,351	480	58.1	19.0	5.7	86.0	34.0

(Continued)

TABLE 1. (Continued)

13-Level Major Occupational Groups	Population Estimate*	Sample n*	% Nonengagement in Leisure-Time		% Risky Drinkers	% Not Eating ≥ 2 Servings of Fruit/Day†	% > 3 Servings of French Fries/Week‡
			Physical Activity	% Smokers			
Black	54,095	75	65.5	12.5	3.2	66.6‡	31.0‡
Other	37,789	41	58.7‡	9.9‡	7.2‡	100.0‡	40.6‡
Non-Hispanic	510,527	502	57.6	17.5	5.0	84.2	30.2
Hispanic	53,708	94	70.7	20.4	10.7	100.0‡	85.4
Farming, forestry, fishing	484,727	515	61.7	30.2	10.7	91.6	50.8
Male	398,364	424	61.0	29.6	12.0	91.4	53.0
Female	86,363	91	64.6	33.1	3.7	93.2‡	37.1‡
White	444,994	455	60.4	29.0	10.9	92.9	49.7
Black	17,113	25	76.6‡	34.1‡	‡	69.8‡	66.1‡
Other	22,621	35	74.6‡	52.7‡	12.6‡	83.6‡	67.6‡
Non-Hispanic	352,469	285	54.1	34.3	12.5	91.5‡	73.7
Hispanic	132,259	230	80.1	19.4	3.0	91.8	21.0‡
Protective service	261,998	270	37.3	28.9	3.7	95.1	34.6
Male	191,073	191	33.5	29.3	3.7	98.8	39.5‡
Female	70,925	79	47.1	27.7	3.6	83.3‡	15.6‡
White	198,451	196	35.1	26.9	4.4	95.9	26.0‡
Black	41,600	47	43.5‡	30.8	‡	91.2‡	91.2
Other	21,947	27	45.7‡	42.8‡	3.1‡	91.6‡	48.6‡
Non-Hispanic	225,498	206	34.7	30.7	4.1	98.1‡	37.8‡
Hispanic	36,500	64	52.1	17.7	1.0	82.9‡	24.0
Private household	111,266	113	55.3	27.6	6.6	95.5‡	20.4
Male	3,941	5	60.7‡	54.9‡	14.1‡	28.5‡	28.5‡
Female	107,326	108	55.1	26.6	6.1	100.0‡	19.5‡
White	93,819	91	56.9	26.0	6.7	94.7‡	26.0‡
Black	5,934	7	78.6‡	51.7‡	‡	‡	‡
Other	11,512	15	30.2‡	28.2‡	9.4‡	100.0‡	‡
Non-Hispanic	89,870	84	52.8	32.4	8.4	92.8‡	‡
Hispanic	21,396	29	65.7‡	7.4‡	‡	100.0‡	43.4‡

* The population estimate and sample *n* represent values for the nonengagement in leisure-time physical activity, smokers, and risky drinkers columns, and does not reflect the sample size of population estimate for fruit and French fries consumption.

†Fruit (*n* = 2,197) and French fries (*n* = 1,823) consumption assessed in the 2000 NHIS only

‡ The estimate presented does not meet the NCHS standard of reliability or precision because the sample size is < 30 and/or the sample size is < 30 and has a relative standard error of $\geq 30\%$.

1.29) versus female adults, those reporting fair to poor health (OR: 2.00; 95% CI: 1.60 to 2.50) versus those reporting excellent to good, and those with one or two functional limitations (OR: 1.52; 95% CI: 1.35 to 1.70) versus no limitations were significantly more likely to report being a current smoker.

Heavy Drinking Model

Report of heavy drinking was significantly associated with young adults employed as transportation and material-moving workers (OR: 3.55, 95% CI: 1.53 to 8.25) versus those in protective-service occupations even after adjusting for confounders. Once again, a pattern of results noted in the univariate analyses for the other occupational groups was also found in the multivariable analyses. Young male adults (OR: 1.75, 95% CI: 1.49 to 2.07) versus female adults and those reporting one or two functional limitations (OR: 1.32, 95% CI: 1.05 to 1.67) versus no limitations were also significantly more likely to report being a heavy drinker. Nevertheless, young adults of black (OR: 0.32, 95% CI: 0.21 to 0.48) and Hispanic (OR: 0.69, 95% CI: 0.54 to 0.89) race/ethnicity versus young white adults were significantly less likely to report being a heavy drinker.

Nonengagement in LPTA Model

After adjusting for confounders, nonengagement in LPTA guidelines was significantly associated with young adults employed as machine operators, assemblers, and inspectors (OR: 3.91, 95% CI: 2.71 to 5.64) as compared with young adult protective-service workers. In comparison with protective-service workers, all other occupations except private household workers had elevated rates of nonengagement in LPTA (range of AORs: 1.78 to 3.21). Young black (OR: 1.53, 95% CI: 1.35 to 1.75), other (OR: 1.48, 95% CI: 1.19 to 1.82), and Hispanic (OR: 1.87, 95% CI: 1.66 to 2.10) adults versus young white adults, those who are obese (OR: 1.26, 95% CI: 1.10 to 1.43) versus those having healthy weight, and those reporting fair to poor health (OR: 2.03, 95% CI: 1.57 to 2.63) versus excellent to good health were significantly more likely not to meet engagement guidelines for LPTA. Finally, male versus female workers were significantly more likely to meet prescribed guidelines for LPTA levels (OR: 0.58, 95% CI: 0.54 to 0.63).

DISCUSSION

In 2000, the top-three risk behaviors related to premature mortality in the United States were (1) tobacco, (2) unhealthy alcohol

TABLE 2. Predictors of Health Behaviors (Smoking, Drinking, and Leisure-Time Physical Activity) Among Young Adult Workers 18–24 yrs of Age Participating in the 1997–2004 National Health Interview Survey*

Occupational Category	Smoking,* OR [95% CI]		Drinking,† OR [95% CI]		Nonengagement in Leisure-Time Physical Activity,‡ OR [95% CI]	
	UOR	AOR	UOR	AOR	UOR	AOR
Administrative support occupations, including clerical	1.59 [1.31–1.92]	1.76 [1.45–2.14]	1.73 [0.80–3.73]	2.12 [0.97–4.61]	2.78 [2.01–3.84]	2.38 [1.71–3.32]
Executive, administrative managerial	2.00 [1.61–2.47]	2.10 [1.68–2.62]	2.02 [0.90–4.52]	2.19 [0.98–4.92]	2.14 [1.53–3.00]	2.05 [1.45–2.90]
Farming, forestry, fishing	2.36 [1.77–3.17]	2.45 [1.81–3.30]	3.14 [1.28–7.73]	2.74 [1.11–6.73]	2.70 [1.84–3.98]	2.96 [2.02–4.36]
Handlers, equipment cleaners, helpers, laborers	2.26 [1.79–2.84]	2.46 [1.93–3.13]	2.63 [1.14–6.10]	2.44 [1.06–5.66]	2.23 [1.59–2.14]	2.53 [1.78–3.60]
Machine operators, assemblers, inspectors	3.44 [2.74–4.31]	3.90 [3.09–4.93]	3.44 [1.48–7.98]	3.27 [1.41–7.54]	3.70 [2.60–5.27]	3.91 [2.71–5.64]
Precision production, craft, repair	3.59 [2.90–4.43]	3.72 [2.96–4.66]	3.42 [1.54–7.59]	2.93 [1.32–6.50]	2.67 [1.90–3.76]	3.21 [2.26–4.55]
Private household	2.08 [1.19–3.63]	2.29 [1.31–4.00]	1.84 [0.55–6.12]	2.64 [0.79–8.84]	2.08 [1.23–3.52]	1.48 [0.89–2.48]
Professional specialty	1.00	1.00	1.55 [0.68–3.53]	1.66 [0.72–3.80]	1.81 [1.30–2.52]	1.78 [1.27–2.51]
Protective service	2.21 [1.58–3.11]	2.43 [1.71–3.46]	1.00	1.00	1.00	1.00
Sales	1.77 [1.47–2.14]	1.97 [1.62–2.40]	2.29 [1.05–5.02]	2.54 [1.16–5.58]	2.78 [2.01–3.86]	2.56 [1.83–3.57]
Service occupations, except protective/household	2.70 [2.24–3.25]	2.99 [2.47–3.63]	2.33 [1.11–4.90]	2.64 [1.25–5.57]	2.89 [2.10–3.97]	2.61 [1.89–3.61]
Technicians/related support	1.18 [0.87–1.60]	1.19 [0.87–1.63]	1.53 [0.64–3.69]	1.62 [0.67–3.92]	2.41 [1.67–3.47]	2.36 [1.61–3.44]
Transportation/ material moving	3.38 [2.59–4.41]	3.47 [2.63–4.57]	4.10 [1.78–9.47]	3.55 [1.53–8.25]	2.43 [1.63–3.63]	2.93 [1.93–4.44]
Gender (ref = females)		1.00		1.00		1.00
Males		1.17 [1.06–1.29]		1.75 [1.49–2.07]		0.58 [0.54–0.63]
Race/ethnicity (ref = white)		1.00		1.00		1.00
Black		0.42 [0.37–0.49]		0.32 [0.21–0.48]		1.53 [1.35–1.75]
Other		0.73 [0.58–0.93]		0.81 [0.51–1.29]		1.48 [1.19–1.82]
Hispanic		0.45 [0.40–0.51]		0.69 [0.54–0.89]		1.87 [1.66–2.10]
Obesity status (ref = healthy weight)		1.00		1.00		1.00
Obese		0.90 [0.78–1.03]		1.00 [0.78–1.28]		1.26 [1.10–1.43]
Self-rated health (ref = excellent to good)		1.00		1.00		1.00
Fair to poor health		2.00 [1.60–2.50]		1.20 [0.79–1.81]		2.03 [1.57–2.63]
Functional limitations (ref = no limitations)		1.00		1.00		1.00
One to two limitations		1.52 [1.35–1.70]		1.32 [1.05–1.67]		0.96 [0.85–1.09]

Estimates in bold are significant at the $P < 0.001$.

*For occupational category, Professional Specialty is set at the reference group.

†For occupational category, Protective Service is set at the reference group.

AOR, adjusted odds ratio; CI, confidence interval; OR, odds ratio; UOR, unadjusted odds ratio.

consumption patterns, and (3) poor diet and physical inactivity.⁴⁵ To the best of our knowledge, this is the first study to present nationally representative data on these leading health indicators among both employed and unemployed young adults in the United States. We found an elevated prevalence of these three leading contributors to mortality in the United States between several young adult worker occupational groups.

Risky alcohol consumption patterns remain a major risk factor for occupational injuries.⁴⁶ Over the past 20 years, surveys that focus on occupational health and drinking consistently show higher rates of drinking among employed young adults than among their older employed counterparts.⁴⁶ We found that employed black young adults engaged in less risky drinking than did unemployed black

young adults. Sloan et al⁴⁷ found racial differences in the relationship between alcohol use during early adulthood and employment status at midlife. Specifically, blacks who were very heavy drinkers as young adults were 4 times as likely as blacks who were occasional drinkers to be unemployed after 15 years of follow-up. We also found that young adult workers employed in transportation and material moving were 4 times more likely to report being a heavy drinker than young adults in protective-service occupations, while young adults employed as machine operators, assemblers, inspectors; precision production, craft, and repair; and farming, forestry, and fishing occupations were 3 times more likely to report being a heavy drinker also. Developing workplace-specific alcohol abuse prevention interventions among young adults worker groups

identified in this study as at risk could assist in thwarting injuries due to risky alcohol consumption patterns.

The majority of adult smokers in the United States initiate the habit before the age of 20 years, while few adults take up smoking after the age of 24 years.⁴⁸ We found that employed young adults, specifically non-Hispanic white male adults, reported the highest rates of smoking as compared with nonworkers. Relative to young adults employed in professional specialty occupations, almost all occupations had 2 times the rate of reporting being a current smoker. It may be possible that young adults seeking full-time employment early in life (rather than higher education) are more likely to come from lower socioeconomic backgrounds where such settings favor the initiation of smoking.⁴⁹ Preventing tobacco use among young adults has been shown to affect both duration and intensity of total use of tobacco, potentially reducing long-term health consequences significantly. While the majority of US workplaces have prohibited smoking on-site,⁵⁰ occupational health professionals could develop workplace-sensitive smoking cessation programs that target these worker groups demonstrating disproportionate levels of smoking.

We found that young workers employed in the “protective-service occupations” and young Hispanics employed as “technicians and related support” occupations reported the highest rates of French fries consumption. Findings from the present study are consistent with those from the Pitt County study and others reporting young American adults consuming few portions of fresh fruit per week.^{51–53} Eating behaviors adopted during this period are likely to be maintained through adulthood, underscoring the importance of encouraging healthy eating strategies and resources at the workplace. Increasing the provision and range of healthy, affordable snacks and meals in the workplace may enable them to exercise their choice of healthier, tasty options and improve their diet.

Young adulthood is characterized by important changes in physical activity, weight, and other factors linked with hypertension.^{54,55} The Coronary Artery Risk Development in Young Adults study demonstrated a 17% risk reduction in incident hypertension among young adults who were more physically active than those who were less physically active.^{55,56} We found that more than 60% of both employed and unemployed young adults reported not engaging in adequate LPTA levels. Even after adjusting for confounders, young adults in almost all occupations had a 2-fold risk in reporting that they did not meet recommended LPTA guidelines (young machine operators, assemblers, and inspectors were the highest) relative to protective-service workers who may be more likely to engage in physical activity in order to meet and maintain job-related physical fitness requirements. Employer-sponsored initiatives such as physical activity workplace promotion programs that educate young adults at the job site on the importance of regular physical activity could assist in addressing the long-term sequelae of hypertension as well as weight management.

Limitations

The cross-sectional design and potential selection effects prevented us from making causal inference. In this study, employment and occupation were based on employment in the 1-week period prior to the survey. Also, self-reported data may be subject to recall bias. It was not possible to control in the models for other important occupational factors such as the number of hours worked (part-time/full-time), permanent versus temporary or contractual worker, unionized versus nonunionized as these indicators were not collected as part of the NHIS. Despite these limitations, the major advantage of the NHIS is that it is a large, multistage nationally representative probability sample of the US population, with a high participation rate and minimal selection bias.^{36,44}

CONCLUSIONS

Although in general, because of the “healthy worker effect,” workers are healthier on average than the general population or unemployed individuals,^{22,23} we observed significantly elevated and variable rates of engagement in negative health indicators and behaviors among all young adults. Unemployed youth showed the highest levels of risky drinking and nonengagement in LPTA, while employed youth had the highest levels of smoking, consumption of French fries, and lowest levels of fruit and vegetable consumption. In addition, we found significant variation in the prevalence of health behaviors by specific occupational groups, even with adjustment for sociodemographic indicators and health status. Given that work sites provide ready access to 65% of the population older than 18 years,⁵⁷ developing job-specific interventions is both critical and logical for implementing tailored health promotion activities. Continued surveillance of these health indicators among employed young adults is critical to monitoring changes in the rates of these negative health indicators.

The passage of the new health care reform bill (HB 3962), which supports the evaluation of workplace health promotion programs that lower health costs and boost productivity among all workers, may serve as a springboard to harness the financial and policy elements needed to implement these necessary workplace promotion programs.⁵⁸ Occupational health professionals and employers should be cognizant of the resource and best practices supported by the health care reform bill to address the disproportionate burden of these negative health indicators among high-risk young adult worker groups identified in this study.

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