ORIGINAL COMMUNICATIONS

THE RELATIONSHIP BETWEEN VIOLENT TRAUMA AND NONEMPLOYMENT IN WASHINGTON, DC

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The purpose of this study was to determine the association of violent trauma with nonemployment status of victims and whether victims who knew their assailants were associated with a higher nonemployment rate than victims who did not know their assailants. Data were collected for 585 patients between 18 and 65 years of age. Patients were residents of Washington, DC, who presented with violent injuries to the emergency department at DC General Hospital between November 1989 and November 1990. Study participants were divided into two groups: those who knew their assailants (Group 1, n=329) and those who did not know their assailants (Group 2, n=256). The overall nonemployment rate for the sample population was 51% versus 29% for residents in the hospital catchment area (comparison population based on census data) ($P<.001$). Of patients in Group 1, 61% were nonemployed compared with 38% in Group 2 ($P<.0001$). Of male patients in Group 1, 55% were nonemployed compared with 33% in Group 2 ($P<.0001$). Of female patients in Group 1, 71% were nonemployed compared with 69% in Group 2 ($P<.80$). Results indicate that there is a significant association between victimization from violent trauma and nonemployment of the victim. In addition, male victims familiar with their assailants had a higher nonemployment rate than victims who did not know their assailants. We conclude that nonemployment seems to contribute to the violence in this population. (*J Natl Med Assoc.* 1994;86:661-666.)

Key words • violence • unemployment

Violent trauma increasingly has consumed not only our national health resources through costly emergency evaluation and treatment, but also our safety. For purposes of this study, violent trauma is defined as trauma caused by interpersonal violence. The 10% rise in our country's violent crime rate between 1989 and 1990 prompted the US Attorney General to state that "a citizen of this country is today more likely to be a victim of a violent crime than of an automobile accident" (*The Washington Post.* April 29, 1991). The largest increase in violent crime, 16%, occurred in cities with populations between 500 000 and 1 million. Washington, DC, with a population of more than 600 000, led the nation's homicide rates from 1989 to 1991, a reflection of the area's violent activity level. With such alarming statistics, an urgent need exists to determine associated, contributing factors.

The literature suggests that nonemployment is a parameter closely associated with violent activity.[1-7] While the factors causing violent crime are multiple, few studies have addressed assessment of the individual

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TABLE 1. NONEMPLOYMENT RATES

Population	No.	Rates (%)	*P* Value*
Comparison	190 400	29	—
Sample	585	51	<.001
Group 1	329	61	<.0001
Group 2	256	38	<.01

*Based on comparison population.

factors that may be associated with a victim's involvement in violence. Most previous studies of employment status and its relationship to violence have been from England, a country with a different racial makeup, access to weapons, social services, and street drugs than the United States.[1-4] Two US studies have addressed homicide and wife abuse with respect to unemployment.[5,6] Another US study, conducted in Detroit, Michigan in the early 1980s, addressed rates of violent injury recidivism and evaluated its association with employment status, but did not attempt to address the association between employment status and participation in violence.[7] As employment status has an important influence on an individual's activities and behavior and impacts the ability to provide for one's self and family, this study was undertaken to assess the association of violent trauma with victim employment status and to evaluate how this relationship is associated with assailant familiarity in a community where violence is prevalent.

MATERIALS AND METHODS

The DC General Hospital Trauma Unit, a division of the emergency department, evaluated and treated approximately 16 000 trauma patients in 1990. All victims of any trauma, without regard to severity, who present to DC General Hospital are evaluated and treated in the trauma unit. Patients admitted to the trauma unit from November 1989 through November 1990, who were identified through interview as victims of violence, between the ages of 18 and 65 years, and residents of Washington, DC, were eligible for the study. Patients who were known to be convicted criminals or who were under arrest at the time of emergency department admission were excluded from study participation. This prevented inclusion of patients into the study who sustained violence at the time of arrest and prevented data collectors from being unwittingly forced into the legal justice process. No screening was performed with regard to probation or plea bargain status.

Study interviewers were either attending physicians or physician assistants on duty who were asked to fill out the study case report form through which all data was gathered. The case report form contained categories to be checked off. Data collected on each patient included demography (age, sex, and race); traumatic event details (mechanism of injury, relationship to assailant, and reason for altercation); and employment status. Study participants who reported that they were presently working any number of hours per week were categorized as employed. Study participants who reported that they were not presently working any number of hours per week were categorized as nonemployed.

TABLE 2. EMPLOYMENT STATUS BY SEX BY KNOWLEDGE OF ASSAILANT

	No. Males (%)	No. Females (%)	Total No. (%)
Group 1*			
Employed	85 (44)	40 (29)	125 (38)
Not employed	103 (53)	96 (71)	199 (60)
Unknown	5 (3)	0 (0)	5 (2)
Subtotal	193	136	329
Group 2†			
Employed	145 (66)	11 (31)	156 (61)
Not employed	73 (33)	24 (69)	97 (38)
Unknown	3 (1)	0 (0)	3 (1)
Subtotal	221	35	256
Total	**414**	**171**	**585**

*Assailant known by victim.
†Assailant not known by victim.

Study participants were classified into one of two groups: victims who knew their assailants prior to the traumatic event (Group 1) and victims who did not know their assailants prior to the traumatic event (Group 2). Both groups were further classified to measure the effect of sex and age on the relationship between violent trauma and nonemployment.

Analyses were conducted on the study population and a comparison population using a *z* test for proportions to calculate *P* values. The comparison population was comprised of 18- to 65-year-old residents in the catchment area that DC General serves (Wards 5 to 8). Although the study population was part of the comparison population, it represented less than 1% of the comparison population. Thus, no statistical adjustments were used. An estimate of nonemployment rates in Wards 5 to 8 was made from federal and municipal population labor force data (DC Dept of Employment Services and DC Office of Planning and Safety. 1989 and 1990. Unpublished data). An unemployed person is defined by

TABLE 3. TIME SINCE LAST EMPLOYED

Length of Time	Group 1* (%)	Group 2† (%)
1 week to 3 months	49 (24)	35 (36)
4 to 6 months	31 (15)	13 (13)
7 to 12 months	38 (19)	11 (11)
>12 months	79 (39)	38 (39)
Unknown	4 (2)	1 (1)

*Assailant known by victim; n=201.
†Assailant not known by victim; n=98.

TABLE 4. RELATIONSHIP BETWEEN VICTIM AND ASSAILANT FOR GROUP 1*

Relationship	No. (%)
Family member	34 (10)
Spouse	32 (10)
Friend	144 (44)
Neighbor	70 (21)
Coworker	2 (1)
Other	47 (14)

*Assailant known by victim; n=329.

the US Department of Labor Bureau of Labor Statistics as a legal resident between the ages of 16 and 65 years who had no employment during the survey week, but was available for work and had officially searched for work in the previous 4 weeks. Those "not in the labor force" are nonworking people who are not categorized as employed or unemployed. The nonemployment rate reflects both the unemployment rate and the not-in-the-labor-force rate. No separate estimates by sex were possible with the available data.

RESULTS

A total of 585 patients comprised the study population. Group 1 consisted of 329 (56%) patients and Group 2 consisted of 256 (44%) patients. Because 318 (97%) of the subjects in Group 1 and 245 (96%) of the subjects in Group 2 were black, the data were not analyzed for differences by race.

Table 1 lists the nonemployment status of the comparison and the study population. The nonemployment rate was estimated to be 29% for the comparison population. This proportion, based on government data, was obtained by adding the 21% of the Wards 5 to 8 population classified as not in the labor force to the 8% of the population classified as in the labor force but unemployed (DC Dept of Employment Services and DC Office of Planning and Safety. 1989 and 1990. Unpublished data).

TABLE 5. REASON FOR ALTERCATION

Reason	Group 1* (%)	Group 2† (%)
Financial	48 (15)	24 (10)
Family problems	72 (22)	3 (1)
Drug-related	30 (9)	3 (1)
Robbery	7 (2)	91 (36)
Other	169 (51)	129 (50)
Not given	3 (1)	6 (2)

*Assailant known by victim; n=201.
†Assailant not known by victim; n=98.

Table 2 shows employment status and sex of subjects in each group. The nonemployment rate among males in Group 1 was greater than that of males in Group 2 ($P<.0001$). The nonemployment rate among females in Group 1 was not significantly greater than that of females in Group 2 ($P<.80$). However, the female nonemployment rates were higher than those for males in both Groups 1 and 2 ($P<.005$ and $P<.0001$, respectively).

Data were analyzed for nonemployment status differences by age for each group; no significant differences were found using chi square between between Groups 1 and 2 ($P<.63$ and $P<.24$, respectively). Only 5% of the study population in each group were over the age of 45 versus 26% of the comparison population.

Table 3 lists the length of time since last employment for study participants. The most frequently reported amount of time since last employment was greater than 12 months.

Eighty percent of Group 1 subjects reported that their assailants were unrelated (nonfamilial) (Table 4). These included friends (44%), neighbors (21%), others (14%), and coworkers (1%). Table 5 lists the reasons for the assault for both groups. There were major differences between Group 1 and Group 2 as to the primary stated reason (eliminating multiple category responses) for assault given by study subjects. In Group 1, family problems constituted the most frequent specific reason (22%) for altercations. In Group 2, in which victims reported that they did not know their assailants, robbery was the most often stated specific reason (36%). For both groups, the most frequently stated reason for assault was "other" (ie, other than financial, family problems, drug-related, or robbery).

DISCUSSION

In 1990, 23 600 people were killed and an estimated 1 million people were evaluated in the emergency

department for trauma-related injuries (*The New York Times.* August 5, 1990).[8] According to Federal Bureau of Investigation data, these evaluations were generated from 103 000 rapes, 642 000 robberies, and 1 047 000 cases of aggravated assault (*The Washington Post.* April 29, 1991). In Washington, DC, 472 murders occurred in 1990, an incidence of 78 per 100 000 people, the highest in the nation and far exceeding the incidence reported in other major foreign cities in the industrialized world (*The New York Times.* August 5, 1990). These numbers represent an increase in the number of murders for the fifth consecutive year, from 1986 to 1990 (*The Washington Times.* January 2, 1991). In 1990, aggravated assaults in Washington, DC, increased by 17%, robberies by 13%, and rapes by 63% over 1989 figures. The cost of evaluation and treatment of victims of violence to Washington, DC, hospitals and ultimately, its public, has soared to $20.4 million in 1989, or $7319 per hospitalized patient with a range up to $261 000 per patient. Fifty-five percent of these costs went toward patients who had been injured by guns. Sixty-eight percent of these victims were uninsured. These uninsured victims of crime accounted for almost 10% of all uncompensated care in District of Columbia hospitals in 1989.[9] The rising costs of health care are due, in part, to nonemployment as the traumatized victims use costly health-care resources. Clearly, socioeconomic influences characterizing violent activity need intensive investigation in the current American milieu of violence.

When the 51% nonemployment rate for our study population is compared with the 29% nonemployment rate for the comparison population, a statistically significant difference was revealed. This suggests that nonemployment is a significant characteristic of victims involved in violence.

Division of study subjects into two groups, based on whether victims of violence knew their assailants, was an attempt to separate subjects into a group of patients who, in addition to being victims, may have been participants in or possibly instigators of violence, and a comparison group comprising victims who plausibly may have been devoid of violent behavior by virtue of the trauma circumstances, and thus, more likely innocent. If these assumptions are true, then the results of the 61% nonemployment rate in Group 1 versus 38% in Group 2 support the hypothesis that participation in violent activity is associated with nonemployment. Nonemployment may be viewed as a risk factor for victimization from violence.

The higher nonemployment rate among females in both groups may primarily reflect women caring for their children, reducing the opportunity for employment outside of the home, as well as perhaps exposure to violence outside the home. Restriction of maternal employment by the rules of Aid to Dependent Children would compound this influence on employment status. Thus, the link between nonemployment and violent trauma observed among females in this population may not have the same implication as it does for males. The nonemployment rate among males in Group 1 substantially exceeded the nonemployment rate in Group 2 males. The different rate of nonemployment among males in the two study groups reflects a greater propensity of male victims who may have actively participated in violence to be nonemployed compared with male victims who report that they were assaulted by an unknown assailant. This finding leads to the hypothesis that nonemployment in adult males contributes to violent behavior and that full employment in our society's adult male population would substantially reduce the incidence of violent acts.

The large numbers of victims in Group 1 whose known assailants were unrelated may hold important implications for the extent to which violence is not domestic. However, data regarding the location of the trauma event (eg, house, street, or bar) was not obtained. The predominance of the "other" category regarding reason for assault is thought to be related to study participants' desire not to reveal reasons for assault, whether because of guilt, shame, fear of reprisal, or any combination of the three (Table 5). This phenomenon is thought to be reflected further in the low number of drug-related incidents reported by study participants (Table 5).

Previous studies have been conducted that examine the relationship between violent trauma and employment. The relevance/applicability of the previous studies to the United States raises two problems: the studies emanate from foreign countries, such as England, or they were conducted prior to the recent surge in this country's violence with its attendant "crack" epidemic of the late 1980s.

Literature most directly related to this subject originated at Britain's Bristol Royal Infirmary in the latter half of the 1980s. In 1986, Shepherd et al[1] surveyed 294 consecutive assault victims, finding a significant difference ($P<.001$) between the assault rate in the unemployed (1/344) and that in the remainder of the population (1/2232), but no correlation with social deprivation. Unlike the present study, this finding, while confirming the violence-nonemployment rela-

tionship, disregarded the possibility and exploration of victims of violence simultaneously being active participants. Addressing this distinction, Bailey et al[2] studied 75 patients from 1981 to 1983, all of whom had sustained maxillofacial trauma. That study most closely resembles the present one in form and outcome, but, by virtue of the focus being only on maxillofacial trauma, is much more narrow in scope and size. In victims with injuries inflicted by someone with whom an established personal relationship existed, the unemployment rate was 34%. This contrasted with an unemployment rate of only 5% in victims injured by unknown assailants or in circumstances wherein no interpersonal conflict existed. These results parallel those of the present study and suggest a universality in the relationship of participation in violence and nonemployment.

However, in a review article, Shepherd[3] concluded that the association of violence with unemployment status was equivocal and that no direct causative link existed. In a series of 49 patients, aged 16 to 40 years, all victims of violence, matched with controls who were accompanying relatives or acquaintances, Shepherd et al[4] again concluded that no demonstrated link existed between unemployment at the time of injury and involvement in violent crime. The preceding studies do not analyze their employment data by sex. This distinguishing feature of the present study is important in any society where women bear responsibility for child rearing at the same ages when they would otherwise be most productive in the workplace.

Relevant studies in this country are outdated with regard to the present epidemic of violence. However, these studies reveal a consistent association in the violence to nonemployment relationship. Lester[5] found that homicide rates correlated with the unemployment rate ($r = 0.62$) to a moderate degree. The data for this conclusion were gathered from the US Bureau of the Census for the period 1933 to 1970, a period during which the level of violent activity clearly had not reached present levels. In an early 1980s study of men who batter, Fitch and Papantonio[6] found a 22% unemployment rate when employment was defined as at least 20 hours per week on a regular basis either as salary or profit from an owned legitimate business. The nonsex-adjusted unemployment rate in the study city of Baltimore, Maryland was approximately 9%. No exploration or explanation of nonemployment rates was given.

The most relevant American study approached violent trauma as a chronic, recurrent disease.[7] In a 5-year follow-up of 501 consecutive survivors of violent trauma sustained in 1980 to 1981 in Detroit, Michigan, more than 70% of the study group was found to be unemployed throughout the 5-year follow-up period (unemployment in this study was defined as documentation of an employer in the medical record any time during the 5-year follow-up period or on the death certificate). This "liberal" definition of employment does not temporally associate employment status of victims with the violent trauma episode, leading to inaccuracies in employment status that our study attempts to avoid by direct interview. Combining the 44.9% nonlabor force of the city's population with the 10.2% unemployment rate, the resultant 55.1% nonemployment rate differed significantly ($P<.001$) from the trauma study victim nonemployment rate of 76%. Again, employment status data were not analyzed by sex. As an indicator of participation in criminal activity, police files of study subjects were reviewed leading to the finding that 15.5% of subjects were either homicide offenders or convicted criminals during the follow-up period. The study did not explore this group's employment status. Such an effort might have shown that nonemployment is associated with violent behavior.

For this and any study that depends on recruiting emergency trauma patients, a representative sample is difficult to obtain because of the critical condition of some patients, rendering them ineligible for research interview. This inability to control sampling was a significant limitation of the study. Sampling was performed without regard to inpatient versus outpatient status. Most, although not all, of the study participants were evaluated and treated as outpatients.

While the study has some limitations, the strong association between nonemployment and victims of violence is highly suggestive. If this relationship can be confirmed by rigorous investigation, it can form the basis of important public policy initiatives. The urgent need for such initiatives is borne of the increasingly prohibitive financial strain placed on our society by violence in the following ways: measures deemed vital to deter the threat to our collective safety, the medical costs of caring for victims, and the adverse impact on victims' productivity. This study addressed the problem by exploring nonemployment as a possible source. It attempted to characterize by assailant familiarity a group of victims that may consist of instigators or participants in violent acts.

As emergency departments represent the interface between medicine and the community at large, this and similar studies become the social responsibility of emergency physicians to the community and its governing bodies.

CONCLUSION

This study suggests that there is a significant association between being a victim of violent trauma and nonemployment. For male victims of violence, a significant association was found between familiarity of victims with their assailants and a higher nonemployment rate. This study represents an effort to discover contributing factors to the current violence epidemic. While further investigation is needed to clarify and support the findings of this study, this and other related studies contribute to formation of a scientific basis on which public policy can be formulated in response to the tide of violence that is increasingly victimizing the United States.

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of hospitalization while lack of brain activity is being documented? What are the costs to the donor, the hospital, the recipients, the insurance companies, and the public? So far, there are no requirements from the federal government to have these organizations reveal their profit-loss statements or "finders" fees.

Currently, the role of black physicians is limited to diagnosing disease, recommending transplant, and increasing the minority donor pool. We are not generally aware of the business end or allowed to be involved in any ownership. Thus, the questions of ethics abound. Is it fair to selectively seek out one aspect of the population and not return something to that community? Even with the increase in African-American donors, blacks in need of organs still appear to wait longer than whites. The best illustration of this was the multi-organ transplantation performed on the governor of Pennsylvania in June 1993. Some medical investigators question the method of tissue testing that allows certain patients to become recipients and delays transplantation into minorities.

What is most interesting are the powerful OPO advocate groups that are pushing for laws across the country that would allow for "presumed consent" in the removal of various tissues after the person has died. In other words, the family could not deny the donation. These laws are not only in direct conflict with the increased donation theory but also contradict the guidelines, set by the Food and Drug Administration (FDA) in December 1993, which require that health histories be obtained to prevent the spread of communicable diseases.

There are already 14 states in the country that allow removal of corneas at autopsy without consent from families. The oldest laws date back to more than 20 years ago. Most people are unaware because these activities occur at the medical examiner's or coroner's office. The organ procurement agency in the District of Columbia is called the Washington Regional Transplant Consortium (WRTC), and it advocated a law that states that chief medical examiners can at their request remove the cornea or heart valves of any patient without the expressed consent of the next of kin. This law passed the city council unanimously. At no time was the WRTC required to show numbers or devise a way of demonstrating how the Washington population

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