Deleterious Effects of Criminal Victimization on Women's Health and Medical Utilization

Mary P. Koss, Ph.D.
Department of Psychiatry
University of Arizona

Paul G. Koss, M.D.
Department of Internal Medicine
Thomas-Davis Medical Centers

W. Joy Woodruff, M.S.
Department of Psychology
University of Arizona

RUNNING HEAD: Criminal Victimization

Correspondence regarding the manuscript should be directed to Mary P. Koss, Ph.D., Department of Psychiatry, University of Arizona College of Medicine, Tucson, Arizona 85724 (602) 626-6315.

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Abstract

Approximately 17 million crimes involving physical contact occur annually, according to national crime survey statistics. Women are particularly vulnerable to victimization. Community-based studies suggest that 1 in 5 women has been raped and 1 in 4 women has been physically assaulted, often by intimate acquaintances and relatives. These types of criminal victimizations have been linked with a lifetime of increased risk for mental disorders. We examined the long-term consequences of crime on physical health. The participants were 413 adult women patients of a worksite-based health maintenance plan (194 randomly selected plan members and 219 victims of crime). Assessment of health status included questionnaires from the Rand HIE battery and medical chart-based data on health service utilization. Findings indicated that severely victimized women, compared to nonvictims, reported more distress and less well-being ($p < .01$), made physician visits twice as frequently in 1986 ($p < .01$), and had outpatient costs in 1986 that were 2 1/2 times greater ($p < .01$). The severity of criminal victimization that a woman had sustained was a more powerful predictor of 1986 physician visits and outpatient costs, in this HMO setting, than were demographics, subjective health status, or other stressors ($p < .001$). Each increment in victimization severity was related to a 33% increase in physician visits and a 56% increase in outpatient costs. Heightened health service usage was temporally linked to victimization using prospective data for two years before, the year of, and two years following crime among three groups of victims (noncontact crime, assault, and rape) and nonvictims ($p < .05$). Victims' physician visits increased 15-24% during the year of the crime and 31-56% during the following year relative to the number of visits during the two precrime years. In contrast, increases of <2% were observed during this period among nonvictims. Physician usage had not returned to precrime levels at the termination of the study in the

second year following victimization. We concluded that criminal victimization has long-term deleterious effects on perceived health and leads to long-lasting increases in health service use. The implication of the findings is that there is a role for the primary care medical system in crime victim treatment that transcends the traditional focus on emergency care and forensic needs.

KEY WORDS: crime, rape, health status assessment, health services utilization, primary care patients, women's health

Deleterious Effects of Criminal Victimization on Women's Health and Medical Utilization

The frequency of crime in the United States is staggering: National Crime Survey (NCS) estimates suggest that Americans sustained more than 17 million personal crime victimizations involving direct physical contact in 1983 (1). These criminal victimizations are clearly major life stressors outside the realm of ordinary experience. Several potential pathways exist by which crime-induced stress could lead to ill health (2). First, emotional responses to crime might be perceived by the patient as physical disease. Second, pre-existing symptoms could be exacerbated, or the tolerance for them lowered, by crime-induced stress. Third, resistance might be taxed by the stress of crime victimization, thereby inducing disease. Existing empirical literature documents an association between elevated stressors and illness (2,3).

Criminal victimization has been specifically associated with a lifetime of increased risk for mental illness (4,5,6). In addition, a small number of studies have reported long-term physical health aftereffects of crime, but the documentation of health impact has been limited to subjective sources of information including self-reported somatic complaints, bed days, and physician usage (7,8). The bulk of existing medical literature, however, is mute on the long-term health care needs of crime victims. Instead, forensic and emergency treatment is emphasized (9,10,11). In the present study, crime's long-term effects on health were documented with standard health status assessment measures as well as objective data on health service utilization.

Women were chosen for focus because the scope of criminal violence against them is of stunning magnitude when crimes by both intimate and stranger perpetrators are considered: 1 in 5 women has been the victim of completed rape and 1 in 4 women

has been physically battered, according to the results of recent community-based studies (12,13,14,15,16). The burden of sexual violence, in particular, falls heavily on women, who represent more than 90% of the rape victims identified in the NCS (17). Morbidity data suggest that women are more likely to report illnesses and to seek medical care (18,19). Much of the excess medical utilization may be accounted for by reproductive health care needs, but health risk factors such as interpersonal violence, which affect women more than men or have a disproportionate impact on women, could also increase their requirements for health care (20,21).

Victimization by violence is a diagnosis that physicians are being increasingly expected to make: both the Surgeon General's Workshop on Violence and Public Health and the Attorney General's Task Force on Family Violence recommended that the medical school curricula include education about domestic violence (22,23). The American College of Obstetricians and Gynecologists (AGOG) recently mailed information about battered women to its 28,000 members (24). The impact of these instructional efforts might be enhanced by inclusion of information about the health impact of victimization.

The setting of the present study was a large primary care medical population. Primary care populations have been shown to include numerous crime victims (12). Specifically, among a sample of 5,086 women primary care patients who received a mailed survey regarding their lifetime exposure to crime, 57% of the 2,291 respondents (45% response rate) were found to have been a victim of contact or noncontact crime at least once since age 14. Husbands, partners, or relatives of the victim perpetrated 29% of the assaults and 39% of the rapes. New victimizations by violent crimes, including robbery with force, assault, or rape, occurred during a six-month period at the rate of 59.1

per 1,000 women patients. Primary care physicians are known to treat a significant proportion of emotionally distressed persons (25,26). If crime induces distress and leads to increased illness, it is reasonable to expect that crime victims would be seen in primary care settings.

Method

On the basis of stress-illness theory we reasoned that crime victims would describe their health less favorably and consume more medical services than nonvictims. To demonstrate that victimization was responsible for these health effects, it was necessary to demonstrate that any elevated health service usage followed crime rather than preceeded it.

Participant Characteristics

All participants were adult women who received medical coverage from a comprehensive, worksite-based health maintenance plan. The sample consisted of 413 women patients (194 randomly selected health plan members and 219 crime victims). They formed a diverse group of urban, working women who were demographically characterized as follows: mean age = 36.4 years, range 19-69 years; 45% married or cohabitating; 63% white and 36% black; 25% with high school educations or less; and 42% with family incomes between $15,000-29,999. The random sample of 194 women was recruited from a list of 1,023 telephone numbers, which represented every 5th woman member of the health plan. Direct recruitment was used to augment the number of victimized participants who were identified in the random sample. Recruitment was accomplished by mailing a short survey containing crime-screening questions to all women members of the health plan (N = 5,086); 45% responded to the survey (N =

2,291). A description of the survey contents and procedures are available elsewhere (12). Among the total of 891 survey respondents willing to be interviewed were 377 crime victims. The 219 women who were interviewed (58% of eligible respondents) had all experienced serious crimes. Demographic comparisons between recruited crime victims and the randomly selected women indicated no significant differences in age, $F(1, 411) = 1.15$, $p = .316$; marital status, $X^2(4, N = 411) = 2.33$, $p = .674$; ethnicity, $X^2(3, N = 411) = 1.83$, $p = .609$; income $X^2(7, N = 406) = 8.49$, $p = .292$; or education, $X^2(5, N = 412) = .75$, $p = .980$.

Interview Procedures

Interviews were conducted at the worksite in a central location where the volume of passersby disguised the destination of participants and reduced the possibility they would be stigmatized. Interviews were scheduled around all three shifts, but were limited to daylight hours for security. Interviewers were 12 mature, adult professional women including nurses, dieticians, social workers, and psychologists. All questions were read to participants and the responses were recorded in the interview booklet by the interviewer. Both participants and interviewers were paid $25 for their time. Oral and written consent to participate were obtained prior to beginning the interview. Signatures authorizing release of medical records were also obtained at this time. Only 2 participants refused access to their medical records. Subsequent to the interview an oral and written debriefing was provided, which contained suggested locations to obtain further information and counseling services if desired.

Measurement of Crime Victimization

All participants, including the known crime victims, were questioned at the beginning of the interview about their exposure to various forms of criminal

victimization. Their responses to these crime-screening questions were used to score the severity of each woman's overall exposure to crime. Participants also designated their most significant crime incident, if any, and provided the date of occurrence. Next, they responded to questions about the characteristics of the crime, injuries sustained, and use of formal assistance following the crime including medical care, specialty mental health care, and victim assistance services. The questions used to screen for crime exposure were taken verbatim from the NCS, which is administered annually to approximately 60,000 households (19). Seven of the 16 NCS items were used including those that focus on purse snatching, home burglary, attempted robbery, robbery with force, threatened assault, assault, attempted rape, and rape. (The crime survey items that were not administered focus on motor vehicle theft.) Typical of the item content is, "Did anyone take something directly from you by using force such as a stick-up, mugging, or threat?"

The NCS procedure for identifying experience with the crime of rape consists only of a single item, which reads, "Did someone attack you in some other way?" This item was not used because it fails to provide the detailed cues typical of the nonsexual crime screen items and has been heavily criticized in the literature (5,27,28). Instead, we wrote five screening questions for rape and attempted rape in a style parallel to the NCS items. Rape was defined according to reformed state statutes as penetration, no matter how slight, including vaginal, oral, or anal intercourse; against consent; and through force, threat of force, or when the victim is incapacitated (29,30). Typical of the item content is, "Has a man made you have sex by using force or threatening to harm you? When we use the word 'sex' we mean a man putting his penis in your vagina even if he didn't ejaculate (come)." Participants gave a yes or no answer to each item to indicate whether or not they had experienced each crime since the age of 14 years. The age of 14

years was chosen as a lower boundary of recall to represent the statutory age for rape. Only two states set a statutory age that is below 14 years (30).

Selection of Participants

On the basis of responses to crime-screening questions and additional criteria to be discussed below, participants were selected whose health service utilization for five years surrounding a significant crime victimization could be reconstructed from longitudinal care records. The following criteria were used to select the crime victims: (1) medical records must be available for two years prior to the crime, for the year of the crime, and for two years following the crime; and (2) no other crime victimization must have occurred for seven years (during the five-year period itself or for two years prior to it). A total of 75 crime victims met these criteria, and complete data were located for 68 of them (91%) including 15 completed rape victims, 26 assault victims, and 27 noncontact crime victims. The following are case examples of the crime victimizations:

Noncontact crime

Ms. A's home was broken into two weeks before Christmas. Money, a videocassette recorder, other electronics, and jewelry were stolen. Christmas presents were sliced open, drawers pulled open, and the house ransacked.

Assault

Ms. B was forced into a car by a strange man and woman. They put a gun to her side and took her purse, money, and identification. Then, they threw her out of the car onto the streetcar tracks.

Ms. C's husband came home one night very drunk. They argued verbally for some time and eventually he pushed her. She pushed him back and "he went crazy." He hit, slapped, and punched her repeatedly.

Rape

Ms. D and her 2-year-old daughter were at a bus stop when a man pulled up in a car, opened the door, and forced her and the daughter into the car at gun point. He drove Ms. D to an abandoned parking lot and raped her with the daughter in the back seat. Then he took mother and daughter back to the bus stop and let them out. Ms. D went to the hospital and police station. Two weeks later she identified the assailaint at a health clinic and he was arrested.

Ms. E and her husband of 30 years came home from a party. They had both been drinking. He wanted to have sex and she didn't. He forced her using some violence. It made her angry. Although he apologized later, she felt her trust had been damaged.

Many of the 68 victims had reported their crimes to justice authorities (79% of the noncontact crimes, 76% of the assaults, and 27% of the rapes). With the exception of rape, most assailants were complete strangers (79% of the noncontact crimes, 77% of the assaults, and 14% of the rapes). Injuries were sustained by many victims (4% of noncontact victims, 39% of assault victims, and 53% of rape victims) and some of these required immediate medical treatment (0% of noncontact victims, 27% of assault victims, and 33% of rape victims). Hospitalization was relatively uncommon (1% of noncontact crime victims, 7% of assault victims, and 12% of rape victims).

A comparison sample of nonvictims was selected from among randomly recruited health plan members. These women answered "no" to all the crime-screening questions

and had five years of continuous medical data available. There were 67 nonvictims among the randomly selected participants, but only 29 had been members of the health plan for five years or more. Complete medical records were obtained for 26 of the 29 (90%). The groups were compared on demographic variables to address the possibility that any utilization differences between victims and nonvictims were due to factors other than crime. No significant differences were present in age, $F(3,91) = 1.42$, $p = .242$; marital status, $X^2(3, N = 95) = 3.36$, $p = .339$; education, $X^2(15, N = 95) = .22.39$, $p = .098$; or income, $X^2(15, N = 95) = 8.97$, $p = .879$. But the groups did differ in ethnicity, $X^2(3, N = 95) = 10.55$, $p = .014$. Although the overall samples were equivalent in ethnic composition (46% of nonvictims were black compared to 43% of crime victims), rape victims were much more likely to be black than were the other crime victims or nonvictims. Covariate analysis was used to address the potential effects of this discrepancy and will be discussed later.

Health Status Assessment Measures

The major components of the test battery developed by the Rand Corporation for their Health Insurance Experiment (HIE) were administered (31). The variables used in the present analyses include the 21-item General Health Index (GHI), which is a measure of how individuals perceive their health. Health perceptions reflect the feelings, beliefs, and ideas that individuals have about their health (32). Higher scores on this index indicate positive health. The 38-item Mental Health Index (MHI) is a summary measure of emotional well-being and the absence of psychiatric symptoms (33). High scores on this index indicate positive mental health. The physical capacities scale consists of 5 items and reflects the ability to perform activities of daily life including strenuous activities without limitations (34). High scores on this scale indicate physical fitness and

the absence of health-related restrictions. The 14-item health hazards scale measures behavioral habits that have established links to morbidity and mortality (35). Included are smoking, drinking alcohol, overeating, and failure to use seat belts. High scores on this scale indicate the presence of behaviors that are potentially injurious to health.

Also part of the Rand battery is a 10-item scale of life change during the previous 12 months (31). The events included are moves, unemployment, changes in job responsibilities, deaths, accidents involving property damage, financial problems, changes in home responsibilities, and relationship breakups. Items about difficulties with children and arguments with spouse/boyfriend were added because they are associated with psychological distress among women. High scores on this scale indicate high levels of stressful life events during the previous year. To capture the effects of major life traumas whose impact might be felt beyond a 12-month period, three individual items were included regarding any exposure to divorce, death, or serious illness in the immediate family.

As a supplement to the Rand battery, the Cornell Medical Index (CMI) was administered (36). It is a systematic review of body systems which served as a substitute for the physical exam. The 126 items referring to symptoms in the following systems were administered: eyes, respiratory, cardiovascular, gastrointestinal, musculoskeletal, dermatologic, neurologic, and urologic. The gynecologic items were supplemented by 5 items on sexual dysfunction (37). The psychiatric items were not asked because they were redundant with items from the MHI. High scores on the CMI indicate the presence of numerous somatic complaints and concerns.

Measures of Service Utilization

The measures of health service utilization were the number of physician visits and outpatient costs. These utilization indices were calculated for each patient for the calendar year 1986. Physician visits often are weighted by charges to adjust for the higher cost of visits to specialists than of visits to primary care practitioners (38). Our availability of complete financial records allowed separate analyses of the number of visits as well as the exact charges associated with the care (39). The variable of visits focused on physician services. Therefore, the following professional services were excluded: psychotherapy, podiatry, physical therapy, dietetics, optometry, and dentistry. Likewise, the variable of outpatient costs focused on charges for treatments by physicians including exams, evaluations, office visits and follow-ups, professional services, consultations, screenings, history and physicals, and missed appointments. Excluded were charges for psychological testing, laboratory, and x-rays.

Childbirth services are the primary cause of female medical service usage, yet they are unlikely to be influenced by crime exposure (38). Therefore such utilization was not relevant to testing the hypothesis posed in the present study. The elimination of these services was facilitated by the fact that they were not provided on-site under the health plan. Medical charges for years prior to 1986 were used in the prospective analysis. They have been converted to 1986 dollars using yearly inflation indexes provided by the Cleveland Clinic Foundation and based on the actual outpatient fee increases each year. Although medical utilization often increases with time, reflecting greater availability of services, this effect was not expected in the present data because accessibility and coverage were constant during the term of the study under the prepaid plan.

Analytic Procedures

Clerical review minimized the potential for missing data. The only replacement of missing values occurred within multi-item scales, where missing items were replaced with the individual subject mean if 80% or more of the items were completed. A summary measure of crime severity was used in some analyses. This measure included responses to all 12 sexual and nonsexual crime screening questions and scored each woman according to the most severe crime she had experienced. The rationale for the scores was the empirically derived Wolfgang Crime Severity Index (40). Among a national sample of adults who rated the seriousness of various crime descriptions, the second highest severity weight was applied to crimes that involved rape (the highest was for murder). The next highest weight was applied to situations where bodily harm was present. Following these findings, we have scored crimes where no bodily contact occurred as least serious, crimes where physical assault occurred as the next most serious, and crimes where rape occurred as the most serious of these three crime types. The most severe level of victimization was allocated to those women who had experienced multiple serious crimes.

The specific definitions of the severity scores are as follows. A score of 1 was nonvictimization. This level applied to women who responded no to all the crime screening items. A score of 2 was mild victimization. This level was applied to women who had experienced noncontact crimes or crime attempts including illegal entry of their home, purse snatching, attempted robbery by threat or force, or threats to harm with a weapon, but who had not experienced any completed contact crimes. A score of 3 was moderate victimization. It was applied to women who had experienced crimes with bodily harm but without attempts to commit sexual acts. These women may have been

robbed with force, beat up or attacked, or attacked with a weapon. A score of 4 represented serious victimization. It was applied to women who had experienced crimes in which they were forced to engage in unwanted oral, anal, or vaginal intercourse. The score of 5 represented multiple victimization. It was assigned to women who had experienced both a completed forcible rape and a physical assault.

Data Analysis

Data analysis included multivariate and univariate analysis of variance, multivariate analysis of covariance for repeated measures, and hierarchical multiple regression. All analyses were performed with the Statistical Package for the Social Sciences (SPSS).

Results

Subjective Health Status

Significant effects of crime victimization severity on subjective perceptions of health were found on four of the health status assessment measures that were analyzed with univariate ANOVA. These were the GHI, F (4,376) = 15.57, p = .015; the MHI, F (4,369) = 6.97, p = .001; the CMI, F (4,387) = 15.45, p = .001; and health hazards score, F (4,387) = 2.53, p = .040. The groups did not differ in physical capacities, F (4,383) = .77, p = .770. Analyses of the body systems that constitute the CMI revealed that higher levels of crime victimization severity were characterized by greater numbers of reported symptoms across all systems except eyes, F (4,383) = 1.76, p = .135 and dermatology, F (4,383) = .60, p = .659. The most sizable of the effects was found on gynecologic symptoms including sexual dysfunction, F (4,383) = 14.51, p<.001. Women who had experienced severe and multiple crime victimization, compared with nonvictims, saw themselves as less healthy, perceived more physical complaints and symptoms of

emotional distress, experienced less physical and mental well-being, and engaged in more injurious health behaviors. In spite of these indications of increased somatopsychic distress, no evidence of impaired functional status was found.

The group means on each of these health assessments have been converted to standard scores and all are illustrated in Figure 1.

Insert Figure 1 about here

Service Utilization

Criminal victimization severity influenced the number of physician visits made in 1986, $F(4,377) = 5.57$, $p = .001$. For example, multiply victimized women visited their physician 6.9 times per year, which was twice as often as nonvictimized women, who made an average of 3.5 visits. Crime victimization severity also affected outpatient medical costs, $F(4,375) = 8.29$, $p = .001$. The cost of treating a multiply victimized woman was $401, which was 2 1/2 times higher than the cost of treating a nonvictim ($161). The numbers of visits and outpatient medical costs are illustrated by level of crime victimization severity in Figures 2 and 3.

Insert Figures 2 and 3 about here

Multiple regression equations were developed to predict 1986 physician visits and outpatient costs. The predictors included five demographic variables (age, marital status, ethnicity, income, and education); four health status assessments (GHI, MHI, CMI, and the health hazards score); and five stress measures (life change, divorce, deaths, illnesses, and criminal victimization severity). Analysis was hierarchical with the variables were

entered in blocks in the following order: demographic variables, health status assessments, and stress measures. This analysis allowed the predictive power of criminal victimization severity to be examined after accounting for the contributions of all other variables.

All of the predictors entered the equations and accounted for 19% of the variance in 1986 physician visits and 18% of the variance in 1986 outpatient costs. Each increment in criminal victimization severity was associated with increases of 33% in physician visits and 56% in outpatient expenses above the utilization figures that characterized the former level of severity. Criminal victimization severity was the single most important contributor to the predictive power for both utilization criteria. In the case of outpatient costs, the variables that were the prominent predictors included marital status (beta = -.12), age (beta = .11), health hazards (beta = .17), and criminal victimization severity (beta = .24). The size of the beta weights indicates that a one-standard-deviation increase in criminal victimization severity would have an effect on health service utilization approximately equal to a two-standard-deviation increase in age or a 1-1/2-standard deviation increase in health hazards. The women most likely to have high numbers of physician visits were those who were living alone, had more injurious health practices, and had suffered severe criminal victimization. The women most likely to have high costs were those who were older, living alone, had more injurious health practices, and had experienced severe levels of criminal victimization. Table 2 shows the beta weights for each variable in the prediction equations and the variance accounted for by each block of predictors.

Insert Table 1 about here

Temporal Links

The numbers of physician visits for two years before, the year of, and two years following a discrete crime (noncontact, assault, or rape) were compared to five continuous years of medical utilization among nonvictimized women via multivariate analysis of variance for repeated measures. Outpatient costs over five years were analyzed similarly. The effect that would test the hypothesized crime-illness link was the sample by time interaction, which would demonstrate that groups differed across time in their level of utilization. In fact, a significant sample by time interaction was found for the dependent variable of physician visits, F (12,270) = 1.85; $p < .041$. Whereas victims had been lower utilizers than nonvictims prior to victimization, their level of utilization overtook that of nonvictims following victimization. All groups of crime victims increased their physician usage during the year of the crime. Specifically, visits increased 24% among noncontact crime victims, 15% among assault victims, and 18% among rape victims compared to the average yearly number of visits each group had made during the two previous years. During the comparable time period, nonvictims' medical visits decreased by 13%.

Increases in physician visits were most marked in the year following the crime during which all crime groups made more visits than nonvictims. Visits made by noncontact crime victims increased 41% over the previous two years' baseline (from an average of 3.6 visits per year during the two years before the crime to 6.1 visits in the year following the crime). Similarly, assault victims increased physician visits 31% and rape victims increased physician visits 56% (from an average of 4.4 and 4.1 visits per

year before the crime to 6.4 and 7.3 visits in the year following the crime). All but two crime victims saw their physician during the year following the crime. By comparison, nonvictims increased their utilization only 2% during year four over their baseline for the two previous years. Increases in crime victims' physician visits were still apparent in the last year of the study, which was two years following the crime: 31% among noncontact crime victims, 15% among assault victims, and 31% among rape victims, compared with a 1% increase among nonvictims over their two-year baseline. Without exception, all crime victims had physician visits during the second postcrime year.

Although similar trends were seen for outpatient medical expenses, the sample by time interaction did not reach statistical significance in this analysis, F (12, 270) = 1.07, p = .384. The average number of physician visits in each group across the five years is illustrated in Figure 4.

Insert Figure 4 about here

Multivariate analysis of covariance also was performed on physician visits and outpatient costs to rule out the possibility that any health impact might have been attributable to other major life stressors (such as family deaths and divorces) or to the potential effects of differences in ethnic makeup among the groups. In these analyses divorce and death were entered as covariates along with ethnicity and income. However, none of the covariates made significant contributions to the prediction of the utilization criteria in these data (physician visits, F (16, 328) = 1.09, p = .356; outpatient expenses, F (16, 328) = .910, p = .558).

Discussion

A consistent pattern of findings documented deleterious and long-lasting effects of crime victimization on health. First, the greater the severity of criminal victimization during a woman's lifetime, the lower were her self-perceptions of current health and the higher were physician visits and outpatient expenses during calendar year 1986. Second, criminal victimization severity was a more important predictor of physician visits and outpatient costs in this sample than were age and health hazards, which have established links with morbidity. Third, increased physician visits were temporally linked to crime among three different types of victims and high medical utilization did not predate victimization. A long-term effect of crime on health was suggested by the fact that the largest increases in service usage were delayed until the year following the victimization. A long-lasting effect was suggested because victims' physician visits never returned to precrime levels during three years of follow-up. The strength of the findings is the cumulative impact of the analyses. Whereas subjective health status assessment alone could have been affected by possible generalized tendencies of some women to say negative things about themselves, the subjective findings were corroborated by objective medical utilization data. The cross-sectional analysis suggested a relationship between crime victimization and medical utilization, but could not establish the direction from which the process is driven. However, the prospective data established that changes in medical utilization followed crime victimization.

The NCS contains data on medical expenses incurred by victims of crime, but questioning is limited only to inpatient treatment and emergency room care (19). The present findings suggest that these statistics may greatly underestimate the true health care costs attributible to crime because they do not capture the increased costs of

longitudinal care. To the extent that the findings can be replicated in other samples and among men, they would be very significant if extrapolated to the approximately 17 million contact contact crimes that occured in the U.S. in 1983.

The results suggest a role for the primary care medical system in assisting crime victims that transcends the traditional focus on emergency and forensic intervention. Criminal victimization severity is a psychosocial variable that could contribute to primary care practitioners' understanding of their patients' perceived health status as well as their relative level of physician visits. Primary care physicians are a potentially important initial point of contact for traumatized crime victims. Criminal justice system involvement was especially low among the rape victims in the present study, but even these women uniformly utilized medical care during each of the two years following victimization. The willingness of these crime victims to seek medical help contradicts data that demonstrate relatively low levels of specialty mental health or victim assistance service usage among them (5). Thus, primary care physicians appear to be an accessible provider group whose services are tied neither to criminal justice system involvement nor to formal identification as a crime victim. Also, primary care practitioners' level of contact with the public is very high. The average volume of patient visits per primary care physician per year in HMO settings ranges from 3,988 to 5,500 visits for the family practitioner and from 2,840 to 3,690 visits for the general internist (41).

Unfortunately, the likelihood is low that physicians currently realize their potential to initiate service provision for traumatized crime victims. The medical literature is mute on the long-term impact of crime victimization (9,10,11). Only 53% of medical school curricula include teaching about domestic violence (42). Nor do accepted clinical practices reflect a recognition of the significance of criminal violence in

women's lives. Specifically, exposure to sexual violence fails to be included in the standard sexual history in clinical medicine (43,44,45,46). Furthermore, using current diagnostic techniques, personnel in a large metropolitan hospital correctly identified fewer than 5% of episodes of domestic violence involving adult female patients (47). Finally, standard psychiatric assessments routinely fail to detect histories of sexual assault among inpatients (48,49).

The failure to screen for victimization by violence communicates a lack of permission to discuss these issues in the medical setting. When psychosocial variables are ignored in diagnosis, somatic complaints, which are the ticket of admission to the medical system, may be inaccurately or inappropriately diagnosed and treated as organic etiology, which in turn places an undue burden on the health service delivery system (50). As well, opportunities will be missed to facilitate simple confiding in a caring person, which has demonstrated therapeutic effects on the immune response (51).

The present sample consisted of an ethnically diverse group of urban working women, which is representative of a large number of American women. These women were also representative of a large population in another respect: they were covered by a prepaid health plan. In 1987 restricted fee-for-service and HMO-type plans represented 44% of the medical insurance written in the United States (52). The advantage of using patients with prepaid care at the worksite was that many of the socioeconomic and availability variables that are known to affect medical utilization were controlled and comprehensive medical utilization data were centrally available (53,54).

There were limitations inherent in the design and setting however. First, the population was limited to women, which precludes making generalizations about the

impact of crime on men's health. Second, the increases in medical utilization observed in the present study might not have been found among those crime victims who would be required to pay a fee for service or whose place of residence limited access to primary care. Under these circumstances individuals' sociodemographic situations may be more important determinants of utilization than their crime victimization experiences. Third, the extent to which ill health represented increased subjective distress as opposed to objective illness cannot be determined from the present data. Both physical assault and rape shatter feelings of personal control and inflict bodily harm; virtually all victims feared for their lives during the crime (55). It is possible that these processes focus attention on internal bodily sensations and establish or heighten concerns about physical integrity (56).

Sadly, crime victims indicate that counseling was the assistance they found most difficult to obtain in the aftermath of crime (57). Some have suggested that the needs of crime victims for emotional support go beyond the medical mandate (58). Improved education on the impact of crime for both physicians and patients will go a long way toward facilitating fruitful medical contact. Meanwhile, minor modifications of current clinical history-taking practices could allow the primary care medical community to identify traumatized crime victims and to offer an appropriate setting in which to consider their treatment options (59). Future research must evaluate the effects on crime victims' health of interventions such as screening for crime victimization (which gives permission to talk about these issues), offering validation of the traumatic impact of crime, explaining the links between victimization and health, and, when appropriate, facilitating referral to specialty mental health and victim assistance services.

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Table 1

Prediction of 1986 Medical Utilization by Demograhpics, Health Status, and Life Stressors

Criterion	Block and Predictor	Beta	Multiple R	R^2	F	DF	p
VISITS							
	Demographics						
	1. Age	.09					
	2. Marital Status	-.13					
	3. Education	-.03					
	4. Income	-.01					
	5. Ethnicity	-.02					
			.247	.061	4.10	5, 316	.0005
	Health Status						
	1. Total Symptoms	.01					
	2. Health Hazards	.14					
	3. GHI	-.08					
	4. MHI	.06					
			.335	.111	4.37	9, 312	.0005
	Life Stressors						
	1. 1986 Life Change	-.08					
	2. Family Illness	.08					
	3. Divorce	.01					
	4. Family Deaths	.08					
	5. Criminal Victimization	.27					
			.436	.192	5.18	14,307	.0005
OUTPATIENT COSTS							
	Demographics						
	1. Age	.11					
	2. Marital Status	-.12					
	3. Education	-.04					
	4. Income	-.02					
	5. Ethnicity	-.06					
			.254	.064	4.36	5, 316	.0005

Table 1 (continued)

Health Status						
1. Total Symptoms	-.01					
2. Health Hazards	.17					
3. GHI	-.07					
4. MHI	.06					
		.340	.116	4.53	9,312	.0005
Life Stressors						
1. 1986 Life Change	-.09					
2. Family Illness	.06					
3. Divorce	.01					
4. Family Deaths	.09					
5. Criminal Victimization	.24					
		.423	.179	4.78	14,307	.0005

Figure Captions

Figure 1

Health Status Assessments in Standard Scores According to Criminal Victimization Severity

Figure 2

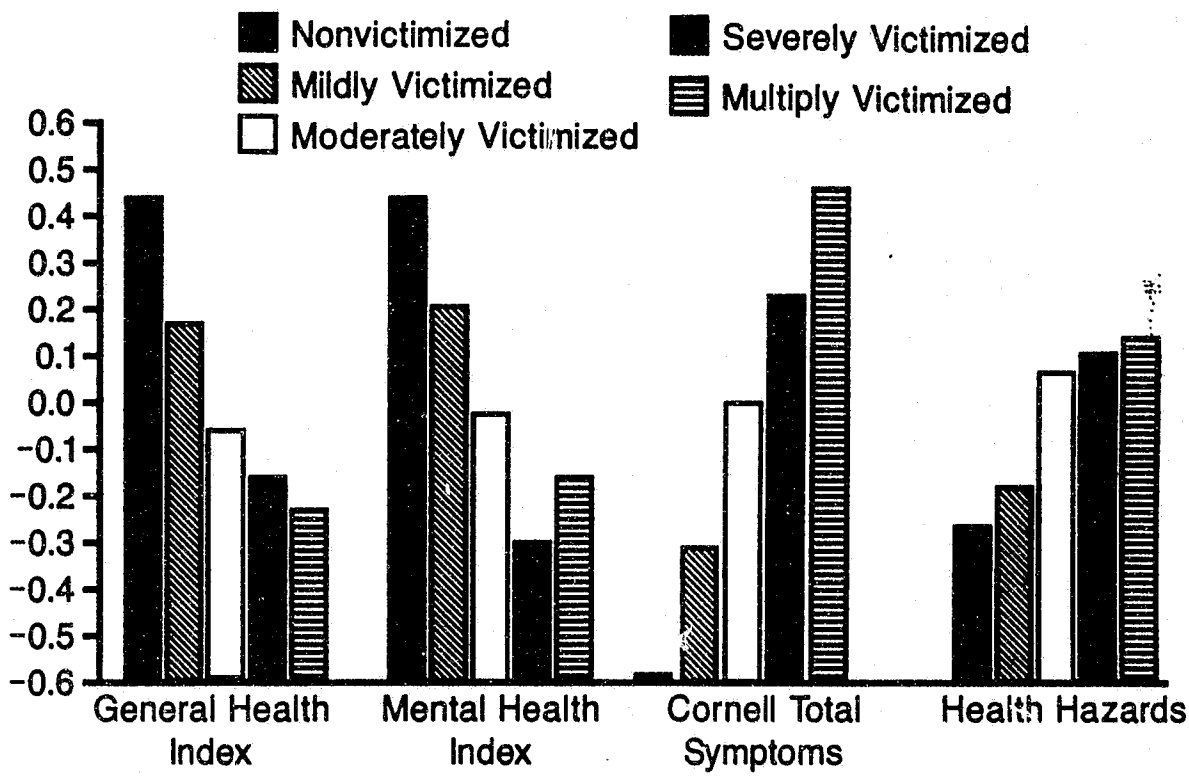
Mean Outpatient Visits in 1986 by Criminal Victimization Severity

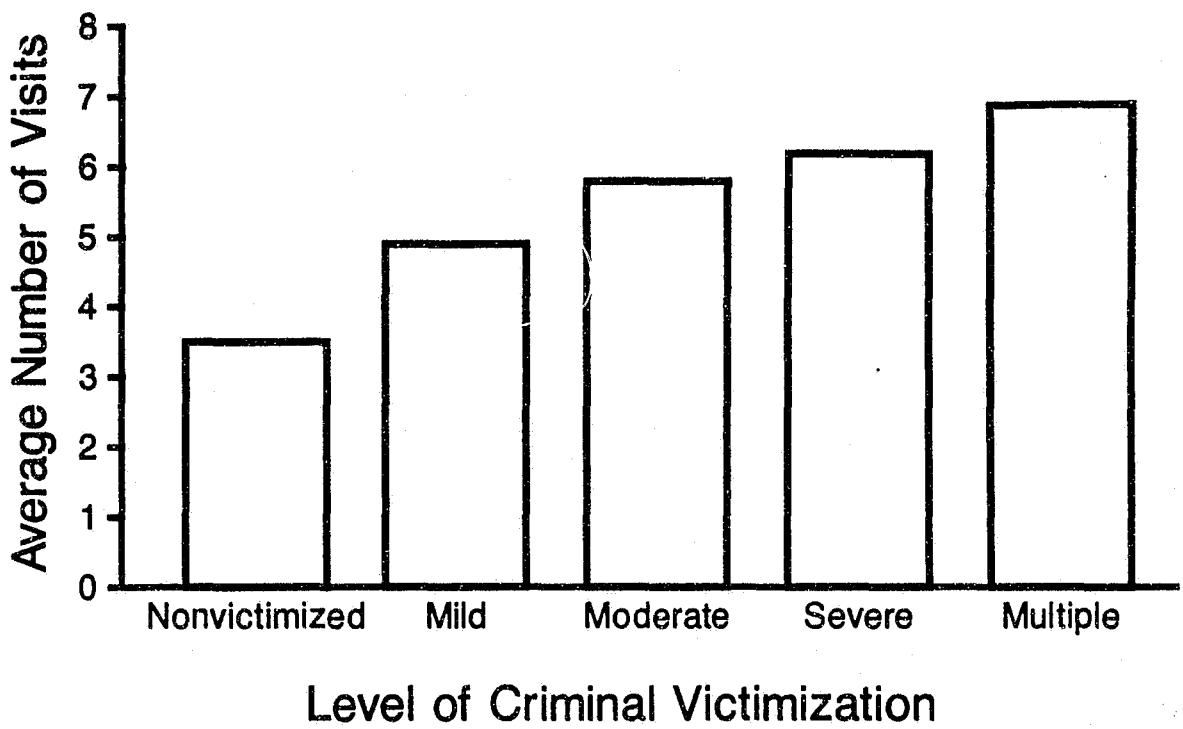
Figure 3

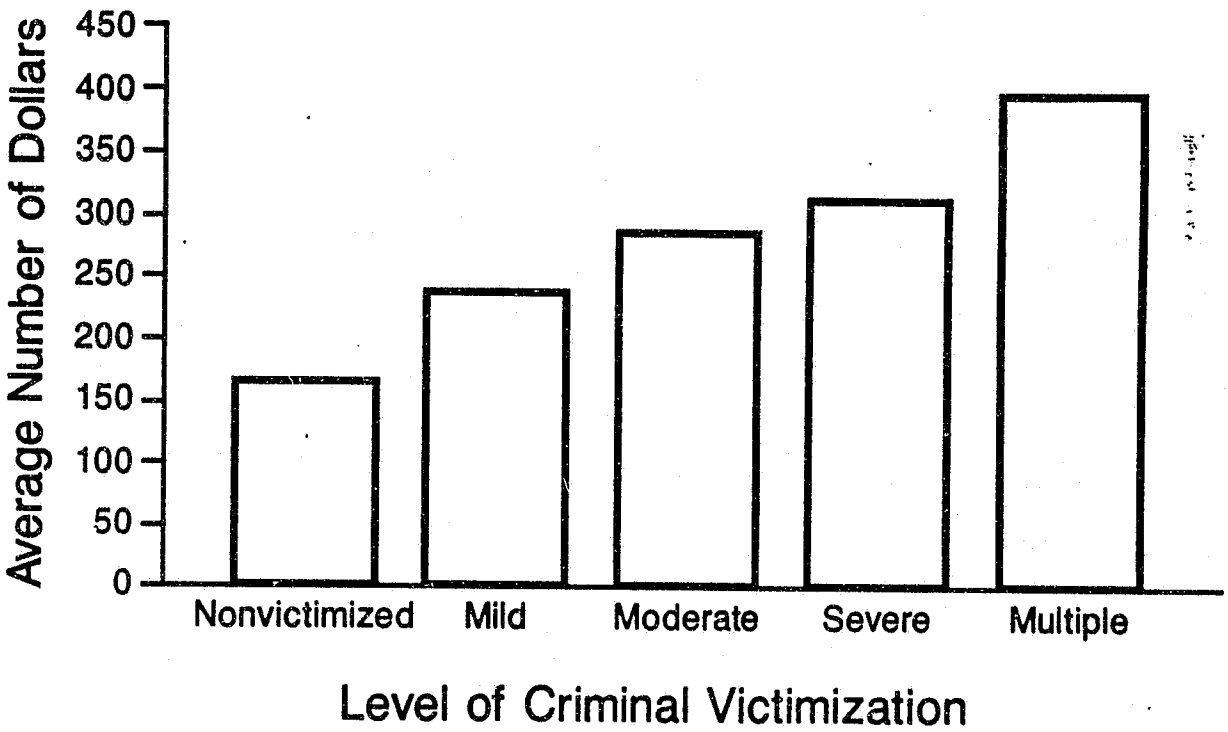
Mean Outpatient Expenses in 1986 by Criminal Victimization Severity

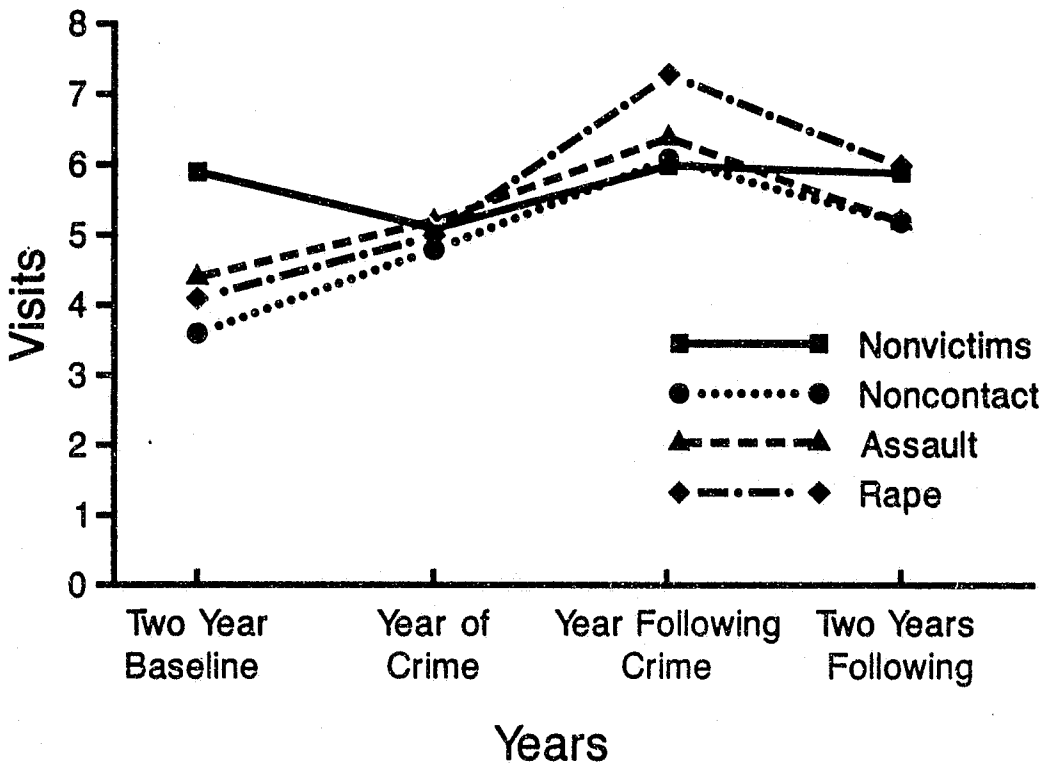
Figure 4

Outpatient Visits Across Five Years Surrounding Crime Victimization


Nonvictimized
Mildly Victimized
Moderately Victimized
Severely Victimized
Multiply Victimized
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
General Health Index
Mental Health Index
Cornell Total Symptoms
Health Hazards


Average Number of Visits
0
1
2
3
4
5
6
7
8
Nonvictimized
Mild
Moderate
Severe
Multiple
Level of Criminal Victimization


Average Number of Dollars
450
400
350
300
250
200
150
100
50
0
Nonvictimized
Mild
Moderate
Severe
Multiple
Level of Criminal Victimization


8
7
6
5
4
3
2
1
0
Visits
Nonvictims
Noncontact
Assault
Rape
Two Year Baseline
Year of Crime
Year Following Crime
Two Years Following
Years

Supplemental Table A

Means on Health Status Measures According to Severity of Criminal Victimization

	Level of Crime Victimization											
	Non-Victims (N = 74)		Mildly Victimized (N = 50)		Moderately Victimized (N = 89)		Severely Victimized (N = 95)		Multiply Victimized (N = 82)			
Variable	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	F	p
GHI												
(34-110)	87.93_{abc}	12.00	84.04	16.31	80.66_{a}	13.67	79.23b	13.77	78.29_{c}	15.57	3.12	.015
CMI (Total)												
(3-61)	15.81_{abc}	8.11	19.16_{de}	12.43	22.81_{af}	10.99	25.51_{bd}	10.99	28.33_{cef}	12.23	15.45	.001
Eyes												
(0-6)	1.27	1.07	1.74	1.44	1.58	1.19	1.72	1.38	1.71	1.33	1.76	.135
Respiratory												
(0-14)	1.39	1.98	1.80	2.36	2.70	2.72	2.69	2.19	2.92	2.65	5.69	.001
Cardiovascular												
(0-10)	1.66_{a}	1.58	2.26	2.30	2.39	1.90	2.29	2.00	3.07_{a}	2.28	4.82	.001
Gastrointestinal												
(0-20)	4.28_{ab}	3.03	5.04_{c}	3.89	5.72	3.88	6.23_{a}	4.40	7.38_{bc}	4.38	6.60	.001
Musculoskeletal												
(0-6)	$.76_{ab}$	.98	.94	1.20	1.43	1.52	1.26	1.48	1.73_{bc}	1.60	5.61	.001
Dermatological												
(0-5)	.91	1.04	.96	1.41	1.11	1.25	1.16	1.26	1.09	1.26	.60	.659
Gyn./Sexual Dysfunction												
(0-11)	3.46_{ab}	2.59	4.08_{cd}	3.04	3.97_{ef}	2.36	5.68_{ace}	2.49	5.86_{bdf}	2.53	14.51	.001

Supplemental Table A (Continued)

Neurological												
(0-10)	1.57_{abc}	1.43	1.78_{de}	1.92	2.81_{a}	2.30	2.97_{bd}	2.08	3.02_{ce}	2.30	8.42	.001
Urological												
(0-5)	$.52_{ab}$	.72	.82	1.08	.91	1.03	1.03_{a}	1.01	1.00_{b}	.93	3.64	.006
Physical Capacities												
(7-15)	14.62	1.16	14.28	1.72	14.27	1.38	14.38	1.14	14.33	1.62	.77	.542
Health Hazards												
(4-28)	13.36	5.25	13.76	4.86	15.03	4.66	15.23	5.04	15.38	5.01	2.53	.040
MHI												
(72-222)	179.63_{ab}	24.48	171.91	29.75	165.15	29.71	156.32_{a}	32.88	160.83_{b}	32.42	6.97	.001

NOTES: The numbers in parentheses represent the range of scores on the variable.
Means with subscripts in common are significantly different from each other at $p < .05$.

Supplemental Table B

Correlations Among Demographic, Health Status, Life Stress Variables, and Outpatient Visits

	Variable Number														
Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Age		10	22	18	27	04	15	04	17	-06	12	23	05	08	17
2. Marital Status			-02	37	04	05	12	-08	-05	14	-20	-01	-01	-07	-18
3. Race				-34	-36	-08	02	10	23	20	08	19	-08	11	06
4. Income					45	11	08	-19	-26	-11	-09	02	04	-13	-13
5. Ed.Level						07	-01	-25	-23	-01	-08	-01	08	-04	-09
6. GHI							34	-05	-53	-16	-15	-14	-20	-23	-16
7. MHI								-14	-42	-28	-06	-06	-02	-23	-04
8. Health Hazards									19	04	05	-06	-08	13	18
9. CMI										24	13	25	10	38	19
10. Previous 12 mos. Stress											12	10	02	19	-05
11. Prior Divorces												08	11	22	13
12. Prior Deaths													25	07	15
13. Prior Illnesses														11	14
14. Victimization Severity															31
15. Outpatient Visits															

NOTES: N = 322. Decimal points are not shown.

Supplemental Table C

Means on 1986 Medical Utilization Measures According to Level of Criminal Victimization Severity

	Level of Crime Victimization									
	Non-Victims (N = 74)		Mildly Victimized (N = 50)		Moderately Victimized (N = 89)		Severely Victimized (N = 95)		Multiply Victimized (N = 82)	
Utilization Measure	M	SD	M	SD	M	SD	M	SD	M	SD
Outpatient Visits	3.50	4.09	4.93	6.22	5.78	4.28	6.16	4.63	6.88	4.66
Outpatient Costs in Dollars	161	195	235	312	289	256	314	246	401	319

NOTE: Within rows all means are significantly different from each other at $p<.05$

Supplemental Table D

Mean Outpatient Medical Utilization Across Five Years Surrounding Crime Victimization

	Time Period									
	Two Years Prior		One Year Prior		Year of Crime		One Year Following		Two Years Following	
Utilization Measure/ Sample	M	SD	M	SD	M	SD	M	SD	M	SD
VISITS*										
Nonvictims	5.58	4.20	6.19	5.03	5.12	4.20	6.00	4.15	5.92	5.58
Noncontact	3.46	4.06	3.75	3.18	4.75	5.04	6.07	6.88	5.21	4.76
Assault	3.39	3.11	5.46	4.20	5.23	3.50	6.39	6.05	5.23	4.52
Rape	4.80	3.64	3.40	4.45	5.00	3.53	7.33	6.49	5.91	5.00
OUTPATIENT COSTS IN DOLLARS										
Nonvictims	201	163	220	183	225	212	276	220	285	244
Noncontact	337	518	363	678	538	918	599	857	464	570
Assault	242	248	316	364	307	350	422	379	311	272
Rape	362	348	381	365	372	178	720	756	621	318

* NOTE: Sample by time interaction is significant at $p < .05$.