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PAPER

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Assaults in the Elderly—A Population-Based Study with Victim and Perpetrator Characteristics

ABSTRACT: The aim of the present epidemiological study was to investigate characteristics of assaults in the elderly aged 65 years and above from the perspective of the victim and perpetrator. This population-based study included 23,142 assaults (according to §§ 224/226 StGB of German criminal law) that were recorded in Bavaria, Germany, from 1999 to 2005. The population-based ratio of serious crimes of battery for the elderly in comparison with the reference population was markedly lower (0.10; 95% CI: 0.09–0.11) in suspects aged more than 65 years and 0.08 (95% CI: 0.07–0.09) for the injured above 65 years. Elderly perpetrators differed significantly concerning the manner of the assault ($p < 0.001$). They committed less crimes in urban areas (56.1% vs. 68.8%) and were victimized significantly more in rural areas ($p < 0.001$; 41.2% vs. 30.2%). Violence in the elderly differs from that of the younger population. Further research is warranted to establish prevention measures.

KEYWORDS: forensic science, serious assaults, senescence, population-based study, chronobiology, elderly population, violence

As the elderly population increases, a growing body of research focusing specifically on age-related issues has developed across scientific disciplines (1). Studies have examined the economic, familial, educative, and political aspects of the role changes and adjusting needs brought about by aging (2). Typically within the literature, and in accordance with the defined age bands of the Bavarian State Office for Statistics and Data Processing, the retirement age of 65 years is applied as a cutoff age to define the "elderly" population (3).

Research has examined violence in elderly populations, looking at both elderly people as victims of and, to a lesser extent, as perpetrators of violence (4). The very old and the very young are typically judged with reference to biological age rather than behavioral characteristics. Consequently, criminal acts of serious violence are rarely associated with the elderly population (2), and to date, research has primarily focused on violence against the elderly, either as victims of general criminality or in the context of neglect and abuse (5,6). Neglect and abuse of elderly victims typically occurs within the scope of a domestic or nursing environment (5). In recent years, studies focussing on intimate partner violence against female victims in elderly populations have been published. Mental illness such as addiction or depression has been suggested as causative factors for such domestic violence (7). The consequences of intimate partner abuse in elderly populations have also been addressed; violence leads to fear and possibly to an increased intake of sedative medications as well as antidepressants (8). Sexual victimization within the elderly population has also been examined. Results, mainly from surveys on female victims, show that sexual violence by strangers is characterized by the use of great force in combination with property offenses (9,10), whereas relatives such as spouses or adult sons are the primary perpetrators of sexual violence in a domestic environment (11). Furthermore, a study on sexual victimization of elderly adults showed that police forces, as well as the judicial system, do not have experience with or knowledge about the particulars of elderly victims (12).

However, violent crimes involving elderly victims have not been examined comprehensively to date. It is likely that a large number of cases go unreported out of fear of stigmatization. Furthermore, conducting survey research is also often difficult with demented or mentally ill individuals (12). The concept of "violence against the elderly" has been discussed in broad terms to include a wide range of behaviors, from direct physical assaults to nonphysical aggressive practices such as verbal aggression or constrictive behavior (5), which has hampered the acquisition of scientifically meaningful data that could facilitate prevention efforts. Studies in Germany as well as in the United States have shown that elderly women are predominantly regarded as victims of "soft" crimes such as theft, burglary, fraud, and, especially, purse snatching (13). Police crime statistics in Germany lead to the following three basic statements: old people are less likely to become victims of violent crime, the acts of violence committed against the elderly are mainly ones in which there was a relationship between offender and victim before

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the offense, and thirdly, elderly women are disproportionately more often victims of purse snatching (14). Traumatization caused by a serious assault can cause social isolation, increased anxiety, and reduction in quality of life (13). Accurate data on patterns and contextual characteristics of serious acts of violence committed against elderly victims are essential if effective preventive measures are to be put in place; to date, such data are lacking.

Older adults are generally assumed to commit only few acts of violence. They tend to live a less dangerous or unconventional life than younger individuals. Furthermore, the acceptance of applicable cultural and moral standards is more likely (15). Thus, a limited number of studies have been undertaken to examine criminal convictions of perpetrators older than 65 years. In one of the few studies to examine crimes of violence committed by people over 65, elderly defendants were convicted more rarely and received commuted sentences more often in comparison with younger criminals (2). When sex differences were also examined, elderly women were given even milder sentences, regardless of the severity of the committed crime (16). However, parallel to a rise in the absolute numbers of violent assaults, the proportion of acts of violence committed by perpetrators older than 60 years of age is rising (17). Indeed, the number of elderly detainees in prisons in the United Kingdom, United States, and Canada is rising, with elderly detainees the fastest growing segment of the incarcerated population (18). Furthermore, it must be assumed that as the elderly population increases, the absolute number of acts of violence within the elderly population will also increase (2). In fact, some studies have shown elderly people to have lower perpetrator rates as well as lower victimization rates when compared with populations of younger adults (2). Thus, further research into the prevalence of serious crimes committed by elderly perpetrators is required for preventive efforts.

As a result of the limited research to date on the particulars of violence carried out either by or on elderly individuals, the aim of this epidemiological population-based study was to explore the characteristics of assault (serious and premeditated crimes of battery). It aims to provide important preliminary information about violence in the elderly regarding the principal location of the crimes (urban vs. rural areas) and the manner of the crimes committed (premeditated vs. serious assaults in public places or a domestic surrounding), as well as significant evidence regarding the chronobiological distributions of the circadian and weekday patterns of violence in the elderly.

Materials and Methods

Data for the study included crimes of violent behavior committed in Middle Franconia (Bavaria, Germany) between January 1, 1999 and December 31, 2005. Information about the crimes had been collected by the Police Department of Middle Franconia and was gathered into the *E*rlangener *Vio*lence *S*tudies (EVioS) database (19). Suicides were excluded from the study. Middle Franconia (1.7 million inhabitants) is one of the seven administrative districts of Bavaria, Germany (12.4 million inhabitants). Further information pertaining to EVIOS and its sister file *E*rlangener *Su*icide *S*tudies (ESuS) can be obtained from former studies (20–22).

To analyze a more homogenous sample, only crimes of battery (at least premeditated or severe or obviously dangerous according to §§ 224/226 StGB of the German criminal law) were extracted from the EVioS file. For each reported violent incident, information was obtained on the sex and age of the victims and the offenders, the exact time of the event, and the classification of the crime. Because of the legal restrictions on secrecy and data protection, the identity of the assailants' occupation, marital status, and the level of impairment by alcohol or drugs as well as medical history were not available. Knowledge about repeat offenders was also not accessible and was not incorporated into the analysis. If more than one offender or victim was involved in the aggravated assault, only the data of the first offender were used for clarity.

Furthermore, STROBE criteria were applied in all stages of study design, analysis of data, and preparation of the manuscript, if applicable (23).

Rates of violence were calculated for each age group of the population, which were obtained from the Bavarian State Office for Statistics and Data Processing. The distribution of the population of Middle Franconia was examined. The strongest stratum of subjects aged between 30 and 65 years was set as reference group (reference ratio: 1.0). Rates of serious assaults in other age groups were analyzed in relation to this group. In accordance with previous literature and the defined age bands of the Bavarian State Office for Statistics and Data Processing, "elderly" victims and perpetrators were defined as those aged 65 years or older.

The calculated ratios represent the quotient of the number of observed serious assaults in relation to the number of expected crimes. As shown in Fig. 1, the mean assault ratio was calculated and was corrected for the age distribution in Middle Franconia. The calculated ratios represent the quotient of the number of observed serious assaults in relation to the number of expected crimes of the population based on population data derived from the Bavarian State Office for Statistics and Data Processing. Therefore, the mean assault rate was calculated for the population at risk in Middle Franconia for four age groups (6–17 years, 18–29 years, 30–64 years, and 65 years and above). The 30- to 64-year-olds were defined as reference population. The mean population-adjusted assault rates of the remaining three age groups were divided by the mean population-adjusted assault rate of the reference population group to get the assault ratios Thus, an age-corrected ratio of 1.5 means, for example, 1.5 times more assaults could be observed (adjusted for the population in this stratum) in the respective stratum than in the reference population. Furthermore, data were also explored concerning gender of victims and perpetrators, location of the crimes (in closed rooms vs. outside on the streets or public places), urban versus rural areas of Middle Franconia, and chronobiological aspects of the crime such as seasonality, weekday, and circadian rhythms. All statistical tests were two sided, the significance levels were set at $\alpha = 0.05$. Univariate analysis was conducted using the chi-square test. For statistical computations, the statistical software package SPSS 16 (SPSS Inc., Chicago, IL) was used.

Results

Data on 23,142 assaults were included into the study. Of these, 82.9% were committed by male offenders and 17.1% by female offenders. The mean age of male delinquents was 31.4 years (standard deviation [SD]–13.7); the mean age of female offenders was 31.1 years (SD–13.5). The age distribution concerning status as victim or offender is shown in Table 1.

Serious crimes of battery were relatively rare in the elderly population sample. Only 2.2% of the offenders and 1.8% of the victims were 65 years or older.

In comparison with the reference age stratum (30 and 65 years), the group of 6- to 17-year-olds had a higher assault ratio of 1.05 (95% CI: 1.01–1.09), whereas the assault ratio in the stratum of 18- to 29-year-old people was more than twice as high with 2.19 (95% CI: 2.14–2.24). In offenders older than 65 years, the

population-based rate was markedly lower at 0.10 (95% CI: 0.09–0.11; see Fig. 1). Comparing the elderly group to the "high-risk" stratum aged 18–29 years, it was 21.6 times more likely for a person in the high-risk group to commit a serious crime of battery than an elderly person.

There were markedly lower population-based victimization ratios in the stratum of the elderly aged 65 years and older (ratio: 0.08; 95% CI: 0.07–0.09). It was 27.2 times more likely for a person in the high-risk group (18–29 years) to be a victim of a serious crime when compared to the elderly group.

Elderly offenders differed significantly from those younger than 65 years concerning the manner of the assault ($p < 0.001$). Serious crimes of battery on streets or public places were markedly more infrequent for elderly offenders (≥65 years: 21.0% vs. 33.4%) and premeditated crimes were even more seldom (≥65 years: 13.3% vs. 22.2%). Elderly subjects were victims of crimes in public places less frequently in comparison with the younger population (22.9% vs. 37.2%), too.

Comparing urban to rural areas of Middle Franconia, there were statistically significant differences between populations over 65 and under 65 years as well. Elderly people committed significantly less crimes of battery ($p < 0.001$) in urban areas (56.1% vs. 68.8%) and were significantly more often victims of a serious assault ($p < 0.001$) in rural areas (43.9% vs. 31.2%).

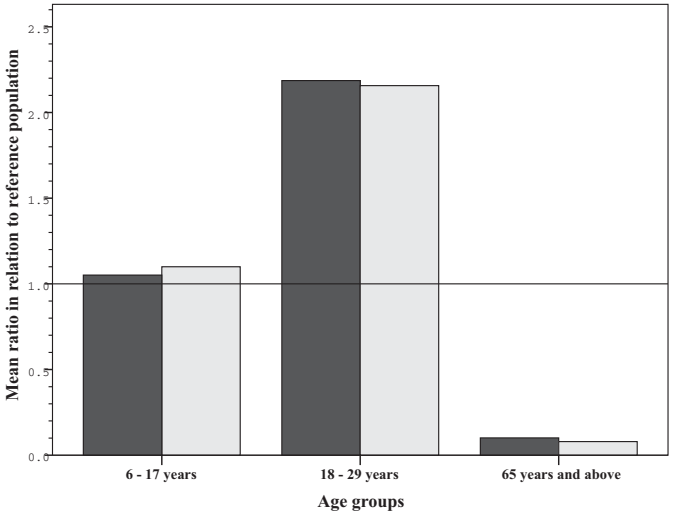

FIG. 1—*Assault and age. The assault ratio for perpetrators is displayed with a black box and the ratio for victims with a gray box. The mean ratio is corrected for the age distribution in Middle Franconia with regard to the assault rate (severe crimes of battery) of the reference population (30–64 years). An age-corrected ratio of 1.5 means that, for example, 1.5 times more assaults could be observed in the respective strata than the reference population.*

Regarding seasonality of serious crimes of battery, there were no statistically significant differences, neither for offenders nor for victims regardless of age. There were marked differences concerning the weekday occurrences; on weekends, more younger persons committed crimes of battery ($p = 0.005$) or were subject to an assault ($p < 0.001$). In the elderly, there were no marked differences between each of the weekdays, neither for committing a crime nor for being a victim of a serious assault.

The circadian rhythm differed for age groups above and under 65 years either for the offenders ($p < 0.001$) or the victims ($p < 0.001$; see Fig. 2).

Discussion

Individuals in the society become more vulnerable to violence as they age. Older adults are potentially more likely to become victims of criminality because of their progressed age along with reduced physical mobility (4). Surveys on fears in elderly populations suggest a high level of intimidation experienced as a result of criminal activity. Younger adults are thought to have more resources to cope with the experience of violence in general; elderly people are considered to be more prone to the negative influences of a serious assault, with social, mental, and physical effects on behavior and a decline in quality of life (24). Victimization in a violent act increases the risk of having to move into a nursing home, resulting in considerable personal, economic, and social consequences (25). A first step in the design of preventive strategies against violence in the elderly is the accurate acquisition of epidemiological data on patterns and contextual characteristics of serious acts of violence in elderly populations.

This study showed a reduced rate of battery assaults committed by offenders aged more than 65 years in comparison with the rates of assaults committed by people in younger age groups. These results are in line with a study on homicides undertaken by the Federal Bureau of Investigation (FBI) in the United States, which identified the elderly population to have the lowest homicide rates consistently since 1998 (3). Theories of control suggest that risk disposition tends to decline with increasing age. Conversely, the willingness for conformity steadily rises, taking into account that elderly individuals perceive a higher risk of conviction than younger individuals (26).

Concerning the sex distribution of assaults, a 2-year survey of an emergency ward in Norway including 1680 assault victims found a dominance of assaults by men against other men (74%). In 21% of the cases, the victims were women, whereas women assaulted men in only 2% and other women in 4% of cases (27). Similar patterns could be observed in this study. However, there were marked differences between the sex distribution of offenders and victims under and above 65 years, which add to the existing literature.

TABLE 1—*Age and gender distribution of victims of assaults for perpetrators above 65 years.**

	% Total	Victim 0–5 years	Victim 6–17 years	Victim 18–29 years	Victim 30–64 years	Victim >65 years
Male perp.—Male victim	40.4% (51.1%)	1.1% (0.3%)	14.2% (20.2%)	11.9% (41.9%)	61.9% (36.2%)	10.8% (1.4%)
Male perp.—Female victim	34.2% (31.7%)	0.7% (0.2%)	6.0% (7.2%)	7.3% (31.3%)	54.3% (59.3%)	31.8% (2.0%)
Female perp.—Male victim	19.9% (11.0%)	2.9% (0.2%)	12.9% (6.9%)	7.1% (22.8%)	48.6% (67.2%)	28.6% (2.9%)
Female perp.—Female victim	9.5% (6.2%)	0% (0.2%)	16.7% (37.8%)	16.7% (26.1%)	42.9% (32.7%)	23.8% (3.1%)

*All figures are given for perpetrators above 65 years. The percentage (% total) refers to the distribution of the four possibilities of gender pairs (perpetrator/victim). The column adds up to 100%.

The percentages in the rows refer to the fraction of victims in each age group in relation to the gender pair. The percentages of the five age-labeled victim columns add up to 100% for each row.

The percentages in parentheses show the figures when all perpetrators would be analyzed, and not only those aged 65 years and above.

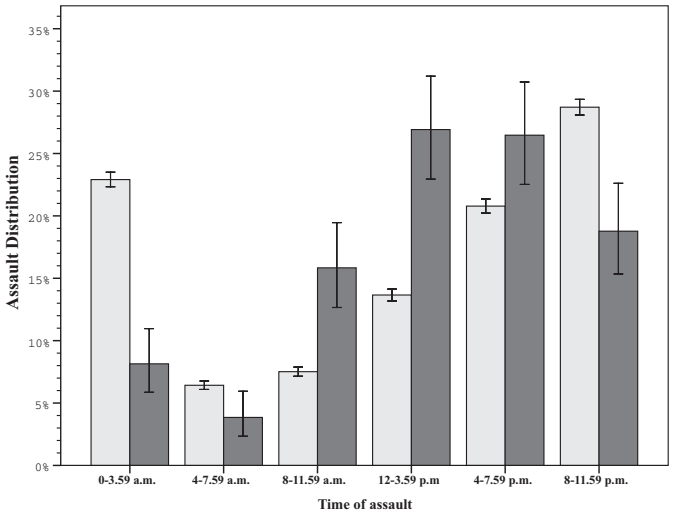

FIG. 2—*The age-dependent circadian pattern of assaults. The assault distribution for perpetrators under the age of 65 years is displayed with a light gray box, the distribution for perpetrators aged 65 years and above with a dark gray box. A 95% confidence interval is displayed for each box. The distribution in percent adds up to 100% for each of the two age strata.*

Recent studies demonstrated that the fraction of victims and offenders, respectively, aged more than 55 years was below 10% (27). Unfortunately, because of the Obligations of Secrecy of German Law, the authors were unable to analyze the relationship between victim and offender in terms of familial, partner-related, or anonymous violence.

The role of older adults as offenders in serious assaults has been neglected in most studies to date. The "aged" individual is generally perceived to be incapable of such a crime because of age-related physical and mental deterioration because excellent physical condition is presumed fundamental to a crime of battery (26). Following the results of this study, it should be taken into account that there is a sizable number of individuals older than 65 years who are neither fragile nor incapable of committing serious assault. However, elderly offenders differed from the younger offender population concerning the manner of the crime. Significantly less serious crimes of battery were conducted in public places by the elderly. Individuals older than 65 years were also less frequently victims of premeditated assaults. The likelihood of becoming a victim or offender as an aged person in rural areas of Middle Franconia was substantially lowered.

Other studies have reported comparable findings regarding age differences in location of crimes; in one study, younger individuals attending an emergency room reported to have been assaulted mostly in pubs, while elderly patients were mostly assaulted at home (28). Similar results were reported concerning homicides in Chicago, USA. Elderly victims were primarily killed in the context of another crime, for example a burglary, whereas younger individuals were mainly killed accidentally during a violent dispute (3). The authors also reported that elderly women were most frequently victims of violence in their own homes and were more likely in need of medical help. This was interpreted in relation to changed social habits, with more time being spent at home with increasing age (3). The finding that elderly subjects are significantly more often victims of a serious assault ($p < 0.001$) in rural areas is in line with other studies on this subject and may be explained by several reasons: people living in rural areas are found to have fewer resources regarding access to domestic violence shelters, physical and mental health professionals, and law enforcement personnel per capita. Furthermore, they may display more traditional gender roles and a higher fraction of poverty than in urban or suburban areas (29).

Such social explanations are in line with the differences of circadian rhythms observed in this study. The population aged more than 65 years committed more crimes and were more likely to become a victim of crime during the day. Differences in daily and weekly social activities might also explain the stability in the number of assaults in the elderly over the course of a week, while rates of serious crimes of battery in the younger population largely occurred on weekends. This finding may be in part because of younger individuals typically working during the week and socially active on weekends and are thereby more likely to become involved in a violent argument at weekends, possibly because of the influence of alcohol and drugs. These weekly work–relaxation cycles do not necessarily apply to people beyond retirement age (30,31).

Generally, the concept of psychopathy is often used to explain violence and serious crimes of battery based on neurobiological abnormalities such as specific amygdala and orbitofrontal cortex as well as limbic network aberrations that do not decline with age (32) and may even become more prominent as the influence of the peer group diminishes, which may lead to a disproportionately higher ratio of violent crimes in relation to the number of elderly subjects.

Limitations of the Study

There are methodological approaches that can be employed to study violent phenomena. Data from emergency room or hospital records may be used to identify patient presentations because of assaults. However, such records typically lack information about the offender or the exact circumstances of the crime, information that is not generally available at the time of admission (33). Such studies predominantly identify younger men aged between 20 and 30 years as the most probable victims of violence in public spaces (34) and women as victims of domestic violence (27). A second approach that can be taken is a survey of police records or data. The use of police records in survey studies introduces an inherent bias because of the potentially large number of unreported cases (28). This study used data extracted from police files to gain insight into the characteristics of violent assaults in the elderly in Middle Franconia. To exclude information bias because of underreporting, only aggravated and serious assaults (mainly premeditated, serious, and dangerous assaults) following the classification of German criminal law were included in the analyses. These assaults were considered to be harder to disguise than, for example, an infliction of moderate bodily harm without longer-lasting physical injuries that do not have to be medically treated.

Former studies have been criticized for their small sample size over a relatively short period of time resulting in weak statistical effects (35). The present study aimed to avoid statistical bias by using a large sample in a defined catchment area of Middle Franconia over a relatively long period of 7 years. As data acquisition took place after the police files were closed, the data are assumed to be as accurate as possible.

Conclusions

Serious crimes of battery in which individuals older than 65 years are involved, as either victim or offender, differ significantly from similar crimes within the younger population. Assaults in the elderly population can result in serious and long-lasting social, emotional, and behavioral consequences. Violence in the

elderly, even if less frequent than rates of violence in younger populations, must be considered an issue of primary importance. These findings should be taken into account in further studies in an effort to guide the development of effective preventive measures.

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