Does Employee Resistance During a Robbery Increase the Risk of Customer Injury?

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Objective: Retail business robberies can lead to employee and customer injury. Previous work demonstrates that employee resistance increases employee injury risk; limited research has investigated customer injuries. This study examines associations between employee resistance against perpetrators and the risk of customer injury. **Methods:** Retail and service robbery reports were obtained from a metropolitan police department. Generalized estimating equations estimated risk ratios and 95% confidence intervals (CIs). **Results:** Customers were injured in 75 out of 697 robberies. Employees resisted the perpetrator in 32 out of 697 robberies. Customers had higher injury risk when employees resisted the perpetrator, compared with robberies where employees did not resist (adjusted risk ratio [95% CI], 2.6 [1.5 to 4.5]). **Conclusions:** Employee resistance against a perpetrator during a robbery increased customer injury risk. Businesses can train employees to not resist during a robbery, providing benefits for both customers and the business itself.

In 2011, there were 354,000 robberies in the United States, of which 23% occurred in commercial houses or retail businesses.[1] Robberies are the leading cause of occupational homicide[2]; deaths from robbery in commercial establishments are estimated at 15 per 1000 robberies,[3] or 0.2 per 1000 persons 16 years or older in the workplace.[2] Retail (eg, gasoline stations and grocery stores) and service establishments (eg, banks and beauty salons) have some of the highest robbery-related homicide rates.[4]

During robberies in retail and service establishments, both business employees and customers are at risk for injury. Previous research indicates that customers were more likely to be injured than employees during violent crimes (ie, homicide, assault, battery, robbery, rape, or attempt to commit any of these crimes) and slightly less likely to be injured than employees during robberies specifically.[5]

Several studies have identified employee risk factors for injury during a robbery, including resistance, possession of a weapon by the perpetrator during the incident, and business-related characteristics (eg, being open late at night or being a small or foreign-owned business).[4–8] The single study that examined both employee and customer injuries during a robbery found that injury risk for employees increased when any employee resisted the perpetrators, anyone (employees or customers) resisted the perpetrators, perpetrators were suspected of using alcohol, the crime was premeditated, or multiple people (employees or customers, excludes perpetrators) were present during the robbery. Injury risk for customers increased when any customer resisted, anyone resisted the perpetrator, the crime occurred on the business property but outside of the business building, there were multiple perpetrators, the robbery happened during an argument, the crime was not premeditated, or only the customer was present during the robbery.[5]

On the basis of existing research, resisting the perpetrator is a frequently occurring risk factor for increased injury during a robbery because it occurs in 60% of nonfatal workplace violence incidents.[2] Thus, training employees in how to respond during a robbery has become commonplace in workplace violence prevention programs.[9] Understanding the role of employee resistance on customer injury may motivate prevention efforts to reduce resistance, especially because customer injury could pose a liability to the business owner. This study's purpose was to estimate the effect that employee resistance against a perpetrator during a robbery in retail or service businesses has on the risk of customer injury.

METHODS

Data Source

Crime reports from 2008 to 2012 ($n = 3839$) were obtained from a large metropolitan police department for any robbery occurring at a business. In this jurisdiction, there were approximately 67,000 licensed businesses from 2008 to 2012. "Business" was defined by the police department, and shoplifting was specifically excluded, based on traditional law enforcement definitions. In law enforcement terminology, robbery involves force or threat of force; shoplifting, a type of larceny, does not involve force.[10] Up to 2239 out of approximately 67,000 businesses (3%) had at least one documented robbery during the study period. Reports that documented both customer and employee presence ($n = 697$) were included in this analysis. All data were abstracted and entered by project staff. Project staff used standardized procedures outlined in the study manual and codebook to ensure consistent coding. The institutional review boards at the University of North Carolina at Chapel Hill and the University of Iowa approved this study. To ensure that all data were abstracted and entered accurately, a random subset of 10% of crime reports was sampled to perform quality checks. If there were discrepancies in coding of the original data compared with the quality checker, the discrepancy was adjudicated by two members of the study team (C.C. and M.N.). Any discrepancies that occurred in a consistent pattern were then checked for in the entire database and cleaned.

Outcome

Nonfatal customer injury during robberies was the outcome. Customer injury was defined as the perpetrator engaging in physical contact with the customer. Injury information was abstracted from the police report's event narrative. If one customer was present during the robbery, then we evaluated whether that single customer was injured during the robbery. If multiple customers were present during one robbery, then we evaluated whether or not any of the customers were injured during the robbery.

Exposure

Employee resistance against the perpetrator during a robbery—defined as being noncooperative, argumentative, or

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physically aggressive toward the perpetrator[5]—was the exposure. Resistance was determined by review of police report's event narrative. If multiple employees were present during one robbery, then we evaluated whether or not any of the employees resisted during the robbery.

Potential Confounders

On the basis of previous studies that investigated either employee or customer injury, potential confounders included the time, month, and day of the robbery; the number of perpetrators; the number of customers; whether or not an employee was injured; and perpetrator use of any weapon.[5,11,12] Previous studies have demonstrated that the number of employees present during a robbery is not associated with employee injury[13] and therefore was not included as a potential confounder. A set of variables to control for confounding was selected using directed acyclic graph (DAG) analysis[14] with DAGitty software (http://www.dagitty.net/).[15] After assessing all potential confounders, one minimally sufficient subset was found—the number of suspects, the number of customers, and weapon use. The final multivariable models included this subset. On the basis of previous studies, it was unclear whether type of weapon used by the perpetrator would influence the effect of employee resistance on customer injury. Three methods of categorizing weapons were used in separate multivariable models—any weapon, gun, and knife use. Exploratory analysis demonstrated that no differences existed in effect estimates using different methods of categorizing weapons. Therefore, all analyses were conducted looking at presence of any weapon.

STATISTICAL ANALYSIS

Data were analyzed with SAS 9.3. Bivariate associations between the explanatory variables and customer injury were estimated using crude risk ratios (CRRs) and 95% confidence intervals (CIs). Because there were businesses that experienced more than one robbery during this study, generalized estimating equations with an unstructured working correlation matrix were used to account for clustering by businesses and estimated—(1) CRRs and 95% CIs for bivariate associations between the explanatory variables and customer injury, and (2) adjusted risk ratios (ARRs) and 95% CIs for the association between customer injury and employee resistance. There were 10 crime reports where both customer and employee presence were documented, but it was not possible to determine which business(es) these crime reports corresponded to. Therefore, to be conservative (ie, obtain larger standard errors), we assumed that all 10 of these crime reports documented robberies from the same business. The final models were built using the minimally sufficient subset identified with DAG analysis.

Previous research suggests that customer injury risk differs between retail and service businesses.[5] Thus, we evaluated industry type as an effect measure modifier using a Wald test statistic to specifically evaluate the industry type by employee resistance interaction term. Industry type was not an effect measure modifier at $\alpha = 0.15$ and therefore was not treated as an effect measure modifier in this study.

The number of customers in the business during the robbery was missing in 151 out of 697 (22%) of reports; a sensitivity analysis was conducted to estimate the potential range of effects of employee resistance on customer injury risk by building two additional models. In the incidents where the number of customers was unknown, we ran models assuming that all incidents had (1) one or (2) multiple customers present.

RESULTS

There were 697 robberies in retail or service businesses observed in this study, where information on both customer injury and employee resistance was available. Among these 697 robberies, 687 robbberies occurred in 595 businesses, although location of the robbery was not recorded for 10 robberies. Among all businesses, 520 businesses experienced one robbery, 64 businesses experienced two robberies, nine businesses experienced three robberies, and three businesses experienced four robberies during this study period. Customers were injured in 11% (75 out of 697) of robberies; employees resisted the perpetrator in 5% (32 out of 697) of the robberies. In 32 robberies where the employee resisted the perpetrator, eight customers were injured; 665 robberies where the employee did not resist the perpetrator, 244 customers were injured (CRR [95% CI], 2.7 [1.6 to 4.8]). In the 75 robberies with customer injury, 65 involved physical force or assault, and eight involved injury by other means (eg, the customer was handcuffed with flex cuffs). At least one weapon was used in 534 robberies—481 involved a gun, 33 involved a knife, and 34 involved other weapons (eg, cup of soda and table). In the effective sample size of 544 robberies (where data for all covariates were not missing), employee resistance against the perpetrator increased customer injury risk (ARR [95% CI], 2.6 [1.5 to 4.5]) (Table 1). Customers in the 153 robberies not included in the multivariable model were significantly less likely to be injured than the customers in the 544 robberies included in the multivariable model ($P = 0.03$); there were no other statistically significant differences. In the sensitivity analysis, the ARRs (95% CIs) were 3.2 (2.0 to 5.0) and 2.8 (1.6 to 5.0), when assuming all incidents with an unknown number of customers present had one customer and multiple customers present, respectively.

DISCUSSION

Employee resistance against a perpetrator during a robbery increased customer injury risk by 160%. To our knowledge, no previous studies have investigated customer injury risk during commercial robberies. Nevertheless, a previous study based in Los Angeles investigating customer injuries during violent crime found that customer injury risk increased by 98% if either employees or customers resisted the perpetrator.[5] This study similarly shows that employee resistance increased customer injury risk during a robbery.

Customers in the robberies not included in the multivariable model were significantly less likely to be injured than the customers in the robberies included in the multivariable model. This finding could be a result of completeness of information available in a crime report; it is plausible that crime reports where no customer injury is documented (ie, there is no documentation of the perpetrator engaging in physical contact with the customer) contain less documented information on variables of interest in this study than crime reports where customer injury is documented.

More than two thirds of the robberies in this study involved the use of a firearm by the perpetrator. One previous study exploring risk factors for employee injuries during robberies showed that the probability of any employee injury decreased when a firearm was used, relative to incidents where no weapon was used.[13] Although this study did not explicitly investigate customer injury risk when a firearm was used in robberies, the CRR of weapon use and customer injury supports the idea that customer injury risk decreased when the perpetrators used a firearm, as a majority of the robberies involved firearm use. Employees may be less likely to resist when a firearm is present, and perpetrators may not intend to inflict physical harm on victims. When the firearm was used, it may have led to a fatal injury, and robbery reports resulting in a homicide were unavailable. Nevertheless, encouraging employees to not resist the perpetrators during the incident can minimize the likelihood of nonfatal physical harm.

Employee training orients employees to a new job, educates employees about best practices, and keeps employees updated on workplace issues. Training employees to not resist during robberies may help decrease customer injury risk. Programs that reduce the likelihood of robbery-related employee injury include training

TABLE 1. Characteristics of Robberies, 2008 to 2012

	Total		Employee Confront or Resist-No		Employee Confront or Resist-Yes		CRR		ARR	
	N	%	*N*	%	*N*	%	(95% CI)	*P*	(95% CI)*	*P*
Total	**697**	**100**	**665**	**100**	**32**	**100**				
Customer injured (*N* missing = 0)							Not applicable			
No	622	89	598	90	24	75				
Yes	75	11	67	10	8	25				
Employee confront or resist (*N* missing = 0)										
No	665	95					Reference			
Yes	32	5					2.7 (1.6–4.8)	<0.01	2.6 (1.5–4.5)	<0.01
Month of robbery (*N* missing = 0)										
March–May	166	24	157	24	9	28	0.7 (0.4–1.2)	0.25	—	
June–August	167	24	158	24	9	28	0.6 (0.4–1.1)	0.12		
September–November	173	25	168	25	5	16	0.6 (0.3–1.1)	0.08		
December–February	191	27	182	27	9	28	Reference			
Time of robbery (*N* missing = 0)										
5:00 AM–10:59 AM	120	17	116	17	4	13	0.5 (0.3–1.2)	0.13	—	
11:00 AM–4:59 PM	143	21	133	20	10	31	0.8 (0.5–1.5)	0.56		
5:00 PM–10:59 PM	218	31	208	31	10	31	Reference			
11:00 PM–4:59 AM	216	31	208	31	8	25	1.1 (0.6–1.8)	0.82		
Day of week (*N* missing = 0)										
Monday–Thursday	405	58	384	58	21	66	Reference		—	
Friday–Sunday	292	42	281	42	11	34	1.1 (0.7–1.8)	0.55		
Industry type (*N* missing = 0)										
Retail	531	76	501	75	30	94	1.5 (0.8–2.6)	0.19	—	
Service	166	24	164	25	2	6	Reference			
Number of suspects (*N* missing = 0)										
1	434	62	411	62	23	72	Reference			
2 or more	263	38	254	38	9	28	1.7 (1.1–2.5)	0.02	1.7 (1.1–2.6)	0.02
Number of customers (*N* missing = 151)										
1	393	72	151	29	2	7	Reference			
2 or more	153	28	368	71	25	93	1.7 (1.1–2.7)	0.02	1.8 (1.2–2.8)	<0.01
Number of employees (*N* missing = 64)										
1	444	70	428	71	16	52	Reference		—	
2 or more	189	30	174	29	15	48	0.7 (0.4–1.2)	0.15		
Employee injured (*N* missing = 7)										
No	533	77	526	80	7	22	Reference		—	
Yes	157	23	132	20	25	78	2.5 (1.7–3.9)	<0.01		
Any weapon used by suspect (*N* missing = 3)										
No	160	23	137	21	23	72	Reference			
Yes	534	77	525	79	9	28	0.8 (0.5–1.3)	0.37	0.8 (0.5–1.3)	0.36

95% CI, 95% confidence interval; ARR, adjusted risk ratio; CRR, crude risk ratio.

in how to respond to a robbery to reduce the likelihood of employee injury.[9,16] Nevertheless, training content has not addressed customer injury risk. Reducing the customer injury risk can benefit the customer (eg, by reducing medical care costs) and the business itself (eg, by reducing liability costs). In addition, many businesses experiencing robbery-related employee injuries are small and independently owned, and most employees are family members. Robbery-related injuries can be devastating to a family and can ultimately result in business closures.[17] Finally, employees are less likely to be injured,[5,6] thus reducing the business's direct and indirect costs.

This study has several limitations. Only information documented in crime reports could be abstracted. Much of this study data was abstracted from the narrative portion of the report (whether or

not a customer was injured, whether or not an employee resisted, the number of suspects, the number of customers, the number of employees, whether or not an employee was injured, and whether or not the suspect(s) used any weapons). Our analyses were restricted to crime reports where customer presence was explicitly documented. The lack of documentation could result from either there being no customers in the business during the robbery or customers being present and not injured. In addition, one key confounder—the number of customers present—was missing in more than one fifth of the reports. Less than 700 robberies were used in this study, resulting in imprecise CIs because of the small number of observations. Employee resistance was only coded when the event's narrative description noted it. Although police are trained to note this behavior, it is possible that some instances of resistance were not captured. Thus, the measure of resistance is likely to have high specificity but unknown sensitivity. Finally, the study data were derived from one metropolitan police department; results may not be generalizable to other locations.

In summary, employee resistance during robberies increased customer injury risk during the incident. Training employees to not resist the perpetrator during the robbery can potentially reduce the customer injury risk.[17,18] Although employee training is a common component of comprehensive robbery prevention programs, training does not include customer injury prevention. Knowledge that training could reduce customer injury risk could help motivate employers to conduct training with their employees.

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