A Review of the Patterns of Police Non-Fatal Assaults Sustained During Violent Arrest Situations

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Abstract: There is a public health and law enforcement officer occupational safety need to assess the patterns of officer assaults during violent encounters. Using a multi-unit and content analysis method, the contents of 30 research studies and three agency annual reports which examined the circumstances of officer assaults and injuries sustained during the confrontation were assessed. The review identifies and synthesizes the key assault patterns from the research. The review examines the patterns of the circumstances, spatial factors, subject characteristics and types of resistance, types of officer injuries, and common risk patterns associated with officer assaults. The outcomes of the review are useful in informing policies, training strategies, and tactical field practices which can be implemented to mitigate officer assaults.

Keywords: Police officer; assault patterns; injury patterns; subject resistance; occupational safety

Nature of the Problem

It has long been recognized that law enforcement is a dangerous occupation. The job of law enforcement officers (LEO) require that they frequently respond to dangerous and violent situations which involve crimes in progress, respond to calls of domestic violence, pursuing fleeing arrestees, apprehend violent criminals, perform traffic stops, and respond to hostile and riotous confrontations. Recent events occurring in many cities across the county have spawned community unrest resulting in riots requiring a police response. While these incidents have called attention to the overall state of community and police relations, they have also focused on the problem that an LEO is at an increased risk of becoming a victim of an assault. In a few incidents, an LEO has died in the line of duty. It has become a daily reality that LEOs are exposed to dangerous and violent situations and such exposure places them at an increased occupational risk for homicide and an assault (FBI, 2019).

Several risk factors associated with law enforcement as an occupation increase the risk of fatal and nonfatal assaults. The National Institute for Occupational Safety and Health

(1996) identified ten risk factors for workplace violence, including assaults and seven of these factors are relevant to LEOs including: contact with the public; mobile work place; working with unstable or volatile people; working alone or in small numbers; working late at night or during early morning hours; working in high crime areas; and working in community-based settings. Annually, LEOs contact on average about 62 million civilians and on average perform about 11 million arrests (Davis, *et al.*, 2018; Duffin, 2020; Harrell & Davis, 2020). These risk factors underscore the increased risk of the LEO becoming the victim of an assault during these encounters.

A violent arrest confrontation may involve active and aggravated aggressive resistance from the subject in which personal weapons or other weapons may be used, or attacking the officer in order to elude being arrested, grabbing and holding the officer, and/or vigorously struggling and wrestling with the LEO. An LEO, may use varying force measures which can include physical control techniques, various types of non-deadly force equipment (including an aerosol, a conducted energy weapon, an impact baton or a projectile), canine, firearms, and restraints in order to subdue a violent and resisting arrestee and/or in self-defense. It is during these confrontations that an LEO becomes more vulnerable to an assault.

Prior research on occupational safety of LEOs has primarily focused on fatal assaults. According to the Federal Bureau of Investigation (FBI), an average of 60 LEOs were feloniously killed in the line of duty between 1987 to 2019 (FBI, 2019). Moreover, during this same period LEOs sustained an average of 61,000 assaults resulting in an average of about 17,000 injuries (28%). Injuries sustained from an assault can result in an increase in workman compensation claims, days missed at work, a disability, work stress, lasting mental trauma, and diminished morale (Bierie, 2017; BLS, 2016; IACP, 2012; Lyons, *et al.*, 2017; Paoline, *et al.*, 2012; Tiesman, *et al.*, 2020; West, *et al.*, 2017). Although the likelihood of an LEO becoming a victim of an assault is more likely than a fatal assault, less is known about the trends, the circumstances, and the impact of assaults on an LEO during a violent confrontation with a civilian (Bierie, 2017; Chang *et al.*, 2016; Tiesman, *et al.*, 2017). Historically, an LEO has not always been considered a victim when sustaining an assault resulting in an injury. Over the years, this perspective has changed as the patterns of LEO assaults are being researched as an occupational hazard (Brandl & Stroshine, 2012; Chang *et al.*, 2016; Lyons, *et al.*, 2017; Tiesman, *et al.*, 2017; Tiesman, *et al.*, 2020).

The purpose of this article is to assess the patterns of the emerging research which have examined assaults on LEOs during a violent confrontation. Assaults on LEOs during a violent situation comprise circumstantial, contextual, situational, environmental, and spatial risk factors. Additionally, a violent situation also involves the method (s) for responding to the resistance displayed by the person and includes decision making about the type and degree of force that is used, including physical control techniques and non-deadly force weapons the LEO selects to control the violently resisting person. Proper threat assessment and using an appropriate level and type of force can be helpful in mitigating the risk of an officer sustaining an assault or an injury during the violent confrontation.

There is a public health and LEO occupational safety need to examine the trends and patterns of LEOs as victims of assault. This discussion synthesizes key findings from the research which have assessed assaults and injuries of LEOs. Based on the assault trends recommendations for improving LEOs safety are discussed which can assist in mitigating the risk of sustaining an assault. Moreover, the findings will be useful in informing policies and practices which will improve training approaches, force decision making and responding with appropriate force measures, and mitigate the occurrence of sustaining an assault resulting in an injury.

Assessment Methods

Using a multi-unit and content analysis approach, the contents of 30 research studies were examined. The primary research method employed by researchers was a retrospective approach, used in 22 studies. A prospective approach was used in four studies, one study reviewed the literature of six studies, and three studies the researchers surveyed LEOs from one respective department each. Documents assessed in the retrospective and prospective studies included: agency records/reports (20); governmental documents (8); and hospital records (2). Of the retrospective and prospective studies, 12 examined officer assault and injury information from one agency and 17 reviewed information from multiple agencies (3 to 12). Of these studies, six examined the information for one year and 24 examined the information longitudinally (2 to 10 years), and three employed a time-series approach.

Annual reports of officer assaults and injuries reported, accessible from their websites, were also reviewed from the following police departments: Chicago, Illinois (2017-2019); Los Angeles, California (2015-2019); and New York, New York (2015-2019). These three police departments collectively annually respond on average to about ten million calls for service, on average perform over 500,000 arrests, and employ about 58,000 LEOs. Since these departments are the three largest in the country, their reported data provides additional information relevant to this assessment.

The patterns of common outcomes emerging from these studies are separated into five major categories including: (1) situational circumstances/nature of the call; (2) location, environmental, and spatial factors; (3) subject characteristics, types of subject resistance encountered, and types of weapon used by the subject; (4) the LEO's assignment, number of LEO's on location, and the force used; and (5) the nature and severity of the injury sustained by the LEO. The final section describes the common reported collective patterns associated with non-fatal assaults on LEOs.

Limitations

Despite the value of the research reviewed, there are limitations. Researchers used varying methods to collect the information, used varying statistical analysis to assess the data, about half of the studies the researchers used multiple agencies to collect the data, and a few researchers collected data for one year. About 75 percent of the studies used a retrospective

design which may increase the risk for bias. There was variation in the nature of the documents reviewed by the researchers. About 75 percent of the studies analyzed arrest/use of force reports, and reported that the findings were as reliable as the LEO's reporting the outcome of the incident. Other documents used included: crime incident reports; agency annual reports; emergency room medical records, and governmental documents.

Not all studies fully reported on all of the risk factors described in this research. For example: twelve studies reported on the circumstances/situations of the assault; three reported on the spatial and associated environment issues; ten reported on the subject's background, behaviors, and types of resistance the LEO encountered; six reported on the type of weapon used by the subject; ten reported on the type of force used by the LEO and the rationale for its use; and five reported on the nature, location, and severity of the non-fatal injury sustained by the LEO. Several studies interchanged descriptions of subject assaults and resistive behaviors leading to an assault an injury of the LEO. Even with these limitations, the combined factors and collective findings provide insights into the associated patterns and relationships of the risk factors impacting victimization of non-fatal assaults on LEOs.

Circumstance and Nature of the Call

The most comprehensive research which identified the contextual nature of the circumstances of LEO non-fatal assaults is reported by the FBI. From 1987 to 2019, the FBI (2019) identified the following circumstances in which an LEO assault is likely: Disturbance call (30%); Attempt to arrest (28%); Traffic stop/Pursuit (12%); Investigating a suspicious person/circumstance (10%); Handling, transporting, and maintaining custody (9%); Handling a mentally ill person (7%); Ambush (3%); and Robbery suspect (1%). During this period, the number of assaults on LEOs averaged about 60,000 annually, resulted in an average of about 18,000 injuries, accounting for about 31 percent. From 2000 to 2019, the number of reported assaults on LEOs declined slightly and averaged about 58,000, about 16,000 resulted in an injury, and accounted for an average of about 28 percent.

Researchers examining agency level data of LEO assaults and injuries have found similar results when responding to the following confrontations: disturbance calls; domestic violence calls, attempting an arrest; performing a traffic stop; mental health calls; foot pursuits, welfare check; unprovoked attack; handling/transporting prisoners; investigating suspicious persons; an ambush robberies; drug related; and property crimes (Bierie, 2017; Brandl & Stroshine, 2012: Castillo, *et al.*, 2012; Chicago Police Department, 2019; Crifasi, *et al.*, 2016; Kaminiski, *et al.*, 2003; Los Angeles Police Department, 2019; Mesloh, *et al.*, 2008; New York Police Department, 2019; Standford & Mowry, 1990; Stroke, *et al.*, 2010).

Location, Environment, and Spatial Factors

Risk factors inherent in the operating environment can exacerbate an LEO's risk of injury in any type of call. Spatial factors refer to the operating environmental elements which may

influence the encounter circumstances which effect a subject's behaviors and the LEO's response. Generally, spatial risk factors can include: diminished visibility; varying terrain; limited lightening; varying surfaces of roadways, streets, and highways; economically depressed areas; repeated calls to the same area or the same location; areas with high concentrations of crime and drug activity, the mentally impaired, and gang violence activity; and areas with a high concentration of bars and nightclubs; to mention a few (Marotta and Caplan, 2013).

Identifying spatial risk factors provides another critical dimension for assessing the dynamics of the assaultive encounter. Adding another layer in the risk analysis integrates a perspective which examines the location and environment of the encounter. It allows an assessment of interpreting probable outcomes and how LEOs may mitigate the risk of injury in light of the circumstance and possible environmental risk factors (Caplan, *et al.*, 2014).

Researchers explored the effects of local-level risk factors which were related to aggravated assaults on LEOs by examining crime incident reports from the Boston, MA police department (Kamiski, *et al.* 2003). The researchers reported that LEOs were more likely to be a victim of an aggravated assault in areas which have a high density of offenders/arrestees, criminogenic conditions, and areas exhibiting a high propensity for violence. The risk of assault is substantially higher in areas characterized by economic distress, family disruption, higher crime rates, and higher concentrations of non-Hispanic and Black residents. Transitional areas with a mobile population, with a younger population of offenders, movement of seasonal workers, and neighborhoods with gangs and drug activity accounted for an 11 percent increase in assaults on LEOs. Further, the researchers found that areas designated as "hot spots," including high crime rates, repeated calls to rowdy bars, certain neighborhoods, and repeated violent disturbances and domestic violence calls increased the risk of assault by about 31 percent. Other researchers have also found that crime in the LEOs' work environment showed a predictive risk indicator to their safety (Fridell, *et al.*, 2009; Ross & Brave, 2020).

Caplan, *et al.* (2014) examined calls for service involving incidents of a battery and spatial risk factors against Chicago police department LEOs for one year. From their analysis, the researchers created a risk model and included the following factors: foreclosed properties; problem buildings; bars; schools; gang territory; banks; apartments; liquor stores; calls for malfunctioning street lights; and retail stores. The researchers found that these locations were more likely located in certain neighborhoods and precincts with higher-than-normal calls for service and increased the likelihood of an assault. For example, the researchers found that a call within three-blocks of a foreclosed property or a problem building or apartment posed a three times greater risk of LEO assault. The researchers concluded that based on the variations in spatial influence of certain location environments and features such as terrain, time of day, limited lighting, limited footing surface and the ability to move naturally, and more motivated offenders, made these locations more prevalent for the chance likelihood of an assault.

Bierie (2017) studied the risk of LEO assaults by examining data from National Incident-Based Reporting System (NIBRS) from 2002 to 2010. Bierie found that the locations of assaults occurring outdoors, residences, and roadways (streets) produced a significant increase in the likelihood of LEOs being a victim of an assault. Bierie also reported that the number of subjects present, male subjects, and crime type (assault and robbery) increased the risk of an LEO assault.

Subject Characteristics and Types of Resistance

Citizen and LEO contacts are dynamic where force can occur when the LEO seeks to maintain control during resistance. A decision to use a particular level and type of force is made in response to the subject's behaviors and the risks it presents to the officer, the subject, and others. Subject resistance can range from passive actions to direct active and aggravated physical actions with or without a weapon. The likelihood of an LEO sustaining an injury depends in part on the degree of subject resistance and the type and degree of force used by the LEO (Hickman *et al.*, 2020; Strote *et al.*, 2010; Tiesman *et al.*, 2017; Tiesman *et al.*, 2020). Examining the subject's behaviors in the context of the circumstance and the environment provides another important layer to the overall risk analysis and informs the potential risks and LEO may confront.

Subject Characteristics

Research on subject characteristics who aggressively resisted and assaulted the LEO found the subject to be predominately male (90%) and averaged 28 years old (age range of 16 to 64). The reported race of the subject was: 46 percent were white; 39 percent were African-American; 10 percent were Hispanic; 3 percent were Asian/Pacific; and 2 percent were classified as other (Castillo *et al.*, 2012; Crifasi, *et al.*, 2016; Strote, *et al.*, 2010).

The research reveals that a majority of the subject's behaviors were consistent with being under the influence of a chemical substance during the confrontation. The findings of the research indicated that the subject showed signs of alcohol or illicit drug intoxication in about 60 percent of the confrontations (Bierie, 2017; FBI, 1987-2019; Castillo *et al.*, 2012; Chang, *et al.* 2016; Hickman, *et al.*, 2020; IACP, 2012; Strote, *et al.*, 2010; Paoline *et al.*, 2012; White & Ready, 2010). Overall, the research showed that an LEO was three times more likely to be a victim of an assault and sustain an injury when the subject was under the influence of a chemical substance.

The research reported varying results on the mental health condition of the subject. The FBI (2019) reported that LEO's were a victim of an assault while handling a mentally ill subject in about 7 percent of the incidents. Some of the past research on mental illness and aggressive behaviors has been mixed. Several researchers have reported that subjects displaying a mental illness are more violent than others who are not mentally ill, are more

violent toward themselves, but the large majority are not more hostile or violent toward others (Mulvey, 1994; Pilgram, 2003; Swanson, *et al.*, 1996).

There are however, exceptions to this general statement. A survey of LEOs by LEXIPOL (2019) found that 60 percent reported that mentally ill subjects accounted for about 11 to 20 percent of their contacts with the public, about 87 percent of the calls required them to use a level of force; and 32 percent sustained an injury during the call. Further, several studies have shown that a subpopulation of the mentally ill exists, they are more likely to engage in violent behaviors, and they are more likely to create a contact with law enforcement (Engel & Silver, 2001; Link, *et al.*, 1992; Monahan *et al.*, 2001; Novak & Engel 2005; Silver, *et al.*, 2008; Swanson, *et al.*, 1996; Swartz *et al.*, 1998).

Generally, these studies found: the person exhibiting psychotic and delusional symptoms was 3 to 6 times more likely to engage in violence than non-mentally ill persons; were noncompliant with taking their medications; chronically used and abused illicit drugs and alcohol also tripling violence; that substance abuse of those diagnosed with schizophrenia or psychotic personality disorders was significantly associated with serious violent acts; that they were more likely to display hostile and violent demeanor and resistance during a law enforcement interaction; and that LEOs were highly more likely to use physical force against this subpopulation over non-disordered persons. In line with other research Johnson (2011) found that the greatest predictor of LEOs' use of force with the mentally ill was subject resistance, hostility of the person, grappling with and striking the LEOs, and possession of a weapon. The likelihood of using force increased by 20 times.

Researchers in two studies reported that the subject exhibited signs and behaviors consistent with a mental illness in a moderate number of incidents. On average, about 15 percent of the incidents researchers reported that encountering a mentally ill subject was not a predictor of violence toward the officer in and of itself (Hickman et al, 2020; Morabito and Socia, 2015). However, when the subject was perceived to be mentally ill, appeared to be under the influence of a chemical substance, and was armed, the risk of violence resulting in an injury to the LEO increased significantly (Morabito and Socia, 2015).

Other researchers reported different findings. An LEO perceiving behavior consistent with mental illness and responding to a mental health call was determined to be a risk predictor associated with violence, assault on a LEO, and the LEO sustaining an injury in a collective average of about 39 percent of the incidents (Castillo, *et al.*, 2012; NY Police Department, 2019; Stroke, *et al.* 2010;).

Subject Resistance and Weapons Used

A significant risk predictor associated with an LEO as a victim of an assault and sustaining an injury during the encounter was the type of resistance displayed by the subject. Subject resistance can be categorized as: passive (lie in or sit in, dead weight, or refusing to move when instructed); defensive resistance (actions of pulling, twisting away, or breaking free

of the grasp of the LEO), active resistance (physical actions of assault by using personal weapons and attempts to flee from the LEO), and aggravated active aggression (actions which cause serious injury or death of the LEO and may include personal weapons or another weapon). All but passive resistance involves the subject using active physical actions to resist the LEO.

The majority of the studies reported that the victim LEO resulting in an injury encountered a subject who displayed physical actions of active resistance (55%), aggravated active aggression (35%), and the subject used a weapon in about 10 percent of the incidents (Alpert & Dunham, 2010; Baldwin *et al.*, 2018; Brandl & Stroshine, 2012; Chicago Police Department, 2019; Crifasi, *et al.*, 2016; Hickman, *et al.*, 2020; Paolione *et al.*, 2012; Mesloh *et al.*, 2008; Tiesman et al, 2017; Tiesman *et al.*, 2020; Taylor & Woods, 2010; NY Police Department; Ross & Brave, 2020; Smith, et. el., 2008; Stroke et al, 2010; White & Ready, 2010). The FBI (2019) reported that the primary weapon used by an assaultive subject were personal weapons (80%), an edged weapon (9%), a firearm (4%); and other dangerous weapons (7%; i.e., weapon of opportunity).

The research showed that a victim LEO of an assault is about three times as likely to sustain an injury when either of these two types of subject resistance are encountered. The research also concluded that an LEO was as least twice as likely to be injured by a subject who attempted to flee from the LEO and continued to resist after being restrained by actively kicking, wrestling and struggling on the ground, and attempting to stand up.

LEO Background and Force Response

LEOs who were victim of an assault and were injured were primarily male (93%). The age range of LEOs included: 50 percent were from 21 to 30 years old, 15 percent were 31 to 45 years old, and 35 percent were from 45 to 58 years old. The average age of the LEO was 33 years old. Years of law enforcement experience ranged from 1 to 6 years (50%), 7 to 14 years (15%), and 15 to 20 years (35%). On average one LEO was on scene (60%), two on scene (25%), three or more accounted for 15 percent and the primary assignment of the LEO was patrol (85%), detective (10%), and other assignment (5%) (Chicago, Police Department, 2019; FBI, 2019; Fridell *et al.*, 2010; IACP, 2012; Tiesman et. al., 2017; Tiesman *et al.*, 2020; West, et. al., 2017). The FBI also reported that on average an LEO is more likely to be assaulted and sustain an injury from 9:00 pm to 3:00 am.

LEOs were primarily assaulted and injured using physical control techniques while responding to the physical, active, and aggravated actions presented by the subject. About 78 percent of the injuries were sustained while the LEO used physical control techniques (i.e., takedowns, hand/leg strikes, pressure points, control holds, and wrist locks) and while applying restraints on the subject. About 50 percent of the injuries occurred when the LEO struggled with the subject for more than one minute. About 50 percent of the injuries occurred in situations where the LEO used force in self-defense. About 35 percent of the

injuries sustained occurred when the LEO used force as the subject presented an immediate threat to him/herself and to others, and/or to prevent the subject from escaping (Alpert & Dunham 2000, 2004; Castillo, *et al.*, 2012; Mesloh, *et al.*, 2008; Paoline, *et al.*, 2012; Smith, *et al.*, 2008; Taylor & Woods, 2010).

When using a conducted energy weapon (TASER), an LEO sustained an injury in about 25 percent of the incidents. Although infrequently reported by the researchers, an LEO using an aerosol, and an impact weapon sustained an injury in about 35 percent of the incidents (Alpert & Dunham, 2010; MacDonald, *et al.* 2009; Paoline *et al.*, 2012). The frequency of using varying types of non-deadly force measures added up to more than 100 percent, as various combinations of force techniques and equipment were applied to the type of subject resistance encountered.

LEO Injury

Researchers concluded that on average an LEO is likely to sustain an injury in about 29 percent of these incidents, (Alpert & Dunham, 2000, 2010; Chang, *et al.*, 2016; Hickman *et al.*, 202; Mesloh *et al.*, 2008; NY Police Department, 2019; Taylor & Woods, 2010). Study findings showed that about 75 percent of injuries sustained by the LEO were classified as minor (sprain, muscle strain, cut, and abrasion), about 16 percent were moderate, and 8 percent were classified as severe (fracture, dislocation, and torn ligaments/tendons) requiring medical treatment. A majority of the injuries were classified as musculoskeletal in nature (Alpert & Dunn, 2000; Brandl & Stroshine, 2012; Chicago Police Department, 2019; Crifasi, 2016; Los Angeles Police Department, 2019; Lyons, et al, 2017; Hickman, *et al.*, 2020; Mesloh, Henych, &Wolf, 2008; LaTourrette, et. al., 2008; Smith, *et al.*, 2008).

Examining hospital records of injured LEOs, Tieseman *et al.* (2017) reported that the nonfatal injuries rate sustained by LEOs was three times higher than the injury rate for all other U.S. workers. In a follow-up study, Tieseman *et al.* (2020) reported that 48 percent of the emergency room treated non-fatal LEO injuries were sustained from an assault and violent act by a resisting subject.

A majority of sustained LEO injuries occurred in the upper extremity which included the hand, fingers, arm, head, neck, and shoulder (55%). Injuries sustained in the lower extremity included the legs, back, shin, ankle, hip, and foot, and accounted for the remaining 45 percent. Back injuries accounted for 40 percent of the lower extremity injuries. The nature of the injuries sustained included sprains, muscular strains, contusions, and lacerations, accounting for about 92 percent of the injuries. About 8 percent of the injuries resulted in a fracture and a dislocation (Alpert & Dunn, 2010; Castillo, 2012; Lyons, 2017; Tiesman *et al.*, 2017; Tiesman, *et al.*, 2020; Mesloh, *et al.*, 2008; NY Police Department, 2019; Chicago Police Department, 2019; Los Angeles Police Department, 2019; LaTourrette, *et al.*, 2008; Smith, *et al.*, 2008).

Common Risk Patterns Associated with LEO Assaults

Every situational encounter comprises numerous variables unique to the confrontation which can potentially increase the risk of an assault on the LEO. Based on the collective findings of the research the greatest degree of association amongst the common variables which were more likely to increase the risk of an assault on a LEO resulting in an injury are described. Common associated pattern factors that ranged from about 40 percent to about 80 percent were found to present the greater risk of an LEO assault resulting in an injury.

Frequency of Occurrence

The research studies align with the FBI's overall finding that victim LEOs sustained an injury in about 29 percent of the circumstance encountered. This represents an assault risk rate of about 1/100 arrests made. The risk of assault and injury rates for LEOs continues to be higher than other occupations in the United States. Elevated risks of assault on an LEO with resultant injury were closely associated with seven of ten of the NIOSH's workplace risk factors for violence described earlier.

Common Incident Circumstances

Of the incident circumstances in which an LEO is more likely to be a victim of an assault, 78 percent included the following: disturbance calls; domestic violence calls; attempting an arrest; traffic stops/pursuits; a subject fleeing from the LEO; and mental health calls/welfare check. About 48 percent of these incidents occurred between 9:00 pm to 3:00 am. Almost two-thirds of the assault circumstances, the LEO was assigned to patrol, and responded as a single unit.

Common Spatial Factors

Spatial risk factors were associated with an increased risk of and LEO assault in about 65 percent of the incidents including confronting a combative subject with limited lighting and responding to a call to various types of roadways, including a rural road, a street in a residential or business area, and on a highway. Foreclosed properties, problem buildings and bars/night clubs also increased the risk of assault when the LEO responded to a circumstance in a high crime area where drug and gang activity was prevalent.

Being aware of the spatial risk factors can assist administrators in planning for resource allocation and appropriate deployment of LEOs. Risk assessment by an LEO should be performed within a perspective of the nature of circumstance, the location and environmental factors impacting the call, and the subject behaviors. For example, making a traffic stop at midnight on a rural roadway in a wooded area of a subject who was observed swerving the vehicle back and forth on the road presents different risks than perhaps making the stop

during the day. Also, responding to a problem building located in a high crime area, with a dense population of offenders to a call of a domestic violence presents a variety of potential risks for possible subject resistance and an assault on the LEO. Being aware of the varying spatial factors can serve as a risk assessment and an assault mitigation strategy assisting the LEO in making more informed tactical responses as the LEO approaches the situation.

Subject Characteristics and Resistance Type

Younger males who physically and actively resisted the LEO increased the risk of assault and comprised over 80 percent of the assaultive incidents. Subjects predominately used personal weapons to resist and assault the LEO in about 80 percent of the incidents. When the subject used other weapons, particularly weapons of opportunity (i.e., bat, stick, board, edged weapon, bottle, officer's weapon, etc.), the LEO was at a greater risk of assault. Moreover, the risk of an LEO assault was about three times greater when the LEO encountered a subject who was perceived to be under the influence of a chemical substance, exhibited apparent behaviors indicating a mental illness, used a weapon, and the subject attempted to flee from the LEO.

LEO Use of Force and Injury

Patterns of subject resistance resulting in an assault and injury to the LEO and the use of force applied by the LEO are interconnected. Active and aggravated physical subject resistance is associated with an assault and injury to the LEO. As subject resistance increased so did the risk of an LEO sustaining an injury increase. Equally, the LEO's use of physical control measures in response to the resistance is also associated with sustaining an injury during the confrontation. An LEO commonly used physical control measures to control and restrain the subject, in self-defense in about 78 percent of the incidents. An LEO is at an increased risk of sustaining an injury occurring in about 40 percent of the incidents when the LEO encountered the subject fleeing on foot, when the LEO struggled and wrestled on the ground with the subject, and when the struggle lasted for more than one minute.

An increase in the resistance and assault related injuries may be associated with a subject's willingness to defy an LEO's authority and actively physically resist. Combined with certain spatial factors, nature of the circumstances, and the influence of chemical substances, and mental impairment, significantly influenced the subject's willingness to resist the LEO. A motivated male subject who is under the influence of a chemical substance during a traffic stop, or during a domestic violence call, or a disturbance call at a rowdy bar or night club, may feel more embolden to actively resist, attack the responding LEO, or attempt to flee. Further, outdoor locations like a traffic stop provide possible avenues of escape and attacking an LEO may suggest a greater opportunity to facilitate the escape.

Additionally, the LEO may be more inclined to use a level of force to quickly control and restrain the subject, for personal safety reasons, and to protect the subject from harming himself and/or others. Indeed, 84 percent of LEOs responded in an occupational survey performed the PEW Research Center (2017) that they are more concerned about their personal safety, about 36 percent responded that they have frequently encountered more active physical resistance from a subject, and about 56 percent of the respondent officers reported that in certain locations and neighborhoods, a more aggressive approach is more effective.

While about 29 percent of the circumstances result in an LEO sustaining an injury, about 78 percent of the injuries are categorized as minor in nature. Primarily, pattern of injuries were identified as musulosketal and the hands, arms, neck, and head were at greater risk of being injured in the upper extremities. Sustaining a back injury comprised about 40 percent of the lower extremity injuries. Sustaining a severe injury resulting in a fracture, a broken bone, or a dislocation occurred in about 8 percent of the incidents.

The research showed that two groups of LEOs are more likely to be a victim of an assault and sustain an injury. LEOs who are younger (age 21 to 32) and have from 1 to 6 years of police experience were more likely to sustain an injury, occurring in about 50 percent of the incidents. Moreover, older LEOs (45 to 55 +) with 15 years or more police experience accounted for about 35 percent of the injuries.

Perhaps LEOs with less job experience have not experienced enough circumstances from a combative and active or aggravated subject resistance for them to form solid tactical approaches to avoid an assault and/or use force measures which would reduce the risk of assault. It may also be that some LEOs failed to specifically recognize contextual behaviors of the subject during the encounter. Conversely, while older and more seasoned LEOs have more street experience, they may have become complacent in their approach, let their guard down when confronting a potentially combative subject, allowed a subject to take a position of advantage, and failed to maintain situational awareness and recognize contextual subject cues of a potential assault, whereby exposing their vulnerability to an assault.

Implications

Interactions between an LEO and a subject can be dynamic, tense, and rapidly changing, and frequently the LEO must make a decision to use a level of force to either control and restrain the resisting subject, in self-defense, and/or in defense of another, and while attempting to effect an arrest within a few seconds of the confrontation. Collectively the research showed that active physical resistance and aggravated active subject resistance comprised over 80 percent of the resistance encountered. Subject resistance was influenced by being under the influence of a chemical substance, mental illness, and the subject's access to a weapon. Moreover, subject resistance is a predictor which influence the types of force an LEO will ultimately use to control the subject.

Several implications emerge from the research which should be considered in mitigating the risk of an LEO assault. First, based on the reported patterns of subject resistance and assaults, LEOs are encouraged, as time permits, to perform a threat assessment of the behaviors, actions, and the statements, or lack of statements of the subject as they approach the circumstance. Throughout the country a significant majority of LEOs patrol in a single unit and are assigned to respond to many calls by themselves. In smaller agencies and in rural communities, back-up may be non-existent or slow in responding when requested due to the limited number of available units or the long distance involved. Maintaining situational awareness to the confrontation circumstances and the nature of the contact, the location and operating environment, subject behaviors, and the subject's access to weapons and weapons of opportunity can assist the LEO in increasing their overall safety. Cueing into contextual cues such as body dynamics and actions of the subject during the contact and maintaining a reactionary distance between the LEO and the subject while assessing the level of threat can also assist in maintaining LEO safety.

When possible, the LEO should radio for assistance, particularly when the LEO is aware of past calls to certain types of circumstances and locations. By policy and practice, dispatch should obtain as much information as possible about the nature of the call, the circumstances, and the location, the number of subjects involved, and advise the responding LEO accordingly. When feasible, and to increase LEO safety, dispatch should send multiple LEOs to certain types of calls, circumstances and locations that have previously been identified as a high crime area, high threat with potential criminal offenders, and a high risk of assault and resistance

Second, using time as a tactic, if feasible, LEOs should attempt to verbally de-escalate the situation through the use of crisis intervention techniques. Talking a subject into compliance is an important strategy to employ which can increase the subject's and the LEO's safety. Third, LEOs should maintain skill proficiency in all of the authorized force options. The pattern of assaults showed that the risk of sustaining an injury increased when the LEO used physical control measures and when attempting to control a violent subject. Increased risk of an injury also resulted when LEO struggled and wrestled with the subject longer than one minute and when the subject attempted to flee from the LEO. Within the totality of circumstances, an LEO should focus on rapid capture and control of the subject to minimize the resistive behaviors and minimize a prolonged struggle, while ensuring their personal safety (Castillo, *et al.*, 2012; Hickman, *et al.*, 2020). While it is acknowledged some resisting situations require the use of physical control measures, LEOs should use reasonable force options that provide distance from the subject to enhance their safety when appropriate. Conducted energy weapons (CEW, TASER) are preferred in these violent situations where the subject is displaying active physical resistance and aggravated active resistance (Alpert & Dunham, 2010; Baldwin, *et al.*, 2018; Bozeman, *et al.*, 2017; Castillo, *et al.*, 2012; Childers, *et al.*, 2020: MacDonald, *et al.*, 2009; Mesloh, *et al.*, 2008; Nakajima & Vilke,

2017; Paoline et al, 2012; Ross & Hazlett, 2018; Taylor & Woods, 2010; Vilke & Payne-James, 2016; White & Ready, 2010).

The research has shown that a reasonable use of the CEW in these types of confrontations reduces the risk of an assault and injury to the LEO and simultaneously reduces subject injury (Brandl *et al.*, 2012; Bozeman, *et al.*, 2008; Roberts & Vilke, 2016; Ross & Hazlett, 2018; Stroke *et al.*, 2009). The research showed that injuries to an LEO who deployed a CEW were reduced by about 75 percent. Further, CEW's effectively used have been shown to shorten the confrontation time span and can assist in multiple LEO's successfully grounding the subject.

Further, researchers exploring the application of an aerosol (oleoresin Capsicun--OC) on subjects who actively physically resisted the LEO showed that an assault resulting in an injury to the LEO decreased by about 65 percent. Several research studies reveal that LEO injuries can be substantially reduced in these types of violent confrontations and also shortens the duration of the struggle with the use of OC (Alpert & Dunham, 2010; Ho *et al.* 2010; MacDonald, *et al.*, 2009; Mesloh, *et al.*, 2008). The research recommends that using CEWs and OC on these types of subject resistance should be considered in lieu of physical force to control active threats by combative subjects.

Third, LEOs can increase their personal safety by using multiple LEOs to ground a resisting subject. After the application of a CEW or OC LEOs should use team takedown techniques by using multiple LEOs and quickly control the subject by controlling large limbs to limit the subject's ability to resist on the ground. As part of the training, LEOs should be taught team takedown techniques which uses multiple LEOs and force options to quickly control and restrain a combative subject based on the level of resistance encountered. Also, as the research indicated, LEOs should expect continued resistance once the subject is grounded. The use of efficient physical control techniques and restraints quickly can minimize injury to the subject and simultaneously to the LEO. Once the subject has been controlled and restrained, an LEO should monitor the subject and provide decontamination protocols with the application of OC and provide access to medical care as warranted.

Fourth, agency administrators should review their response to resistance policy and modify it as warranted in accordance with the objective reasonableness standard (Brave, 2020). Agency administrators should structure the policy which authorizes the use of all force techniques, non-deadly and deadly force weapons and equipment, and the use of restraints. The policy should clarify the application of CEW and OC and allow their use within the totality of the circumstances, and guide an LEO to apply such force by giving a verbal warning first, if possible, give the subject reasonable time to comply with the warnings, consider the environment for their application, consider the condition of the subject, and authorize their application on active physical resistance or higher. The policy should guide the LEO to assess the situation after an application of force, before deploying another burst of OC or activation of the CEW. Based on the response of the subject, the LEO should be directed to transition to another force option as warranted and to cease

the use of force once the subject is controlled and restrained. The policy should direct the LEO to monitor the subject after any force application and provide access to medical care as appropriate.

Fifth, agency administrators should maintain an organizational culture of LEO safety. Through policy and practice supervisors should work with LEOs by reminding them to review agency policies, adhere to their training, and practicing safety protocols on each call for service. Daily reminders which support a culture of safety can be performed at roll call by the shift supervisor prior to LEOs being deployed. Supervisors reminding LEOs to wear their body armor, to be careful in driving through traffic and responding to various calls, to perform a threat assessment as they approach a situation, and to apply reasonable force options, can assist in reinforcing the culture of safety (Hill, *et al.*, 2014; IACP, 2012; LaTourrette, *et al.*, 2008; Sandberg, *et al.*, 2010).

Sixth, several training implications emerge from the research and providing safety training assists in supporting an organizational culture of LEO safety. Agency administrators should direct use of force instructors to provide training on a regular basis on the agency's response to resistance policy and document the training. Competency-based training in de-escalation techniques, and all authorized and improvised force options, including physical control techniques, non-deadly force equipment, restraints, and firearms should be provided on a recurring basis. Academy and agency instructors should emphasize safety protocols through training as referenced in this discussion. FTO instructors should re-emphasize the culture of LEO safety and enlarge evaluations by the FTO which assesses the safety measures practiced and employed by LEOs on various calls and subject contacts.

The research revealed that two groups of LEOs were more vulnerable to the risk of assault. LEOs who have been on the job less than six years and LEOs with 15 years or plus experience were at a higher risk of assault. In order to mitigate officer assaults, agency instructors should design training and provide it on a regular basis which emphasizes officer safety by addressing high assault likelihood calls, circumstances, operating environment and locations, various types of subject resistance, subject threat analysis, and reasonable force options in accordance with the resistance encountered. The training should be provided to all LEOs so as to not draw attention to a few LEOs. If, however, after supervisory assessments of an LEO who has been the victim of assault fails to follow reasonable safety protocols and training, separate training and measures should be employed.

Agency instructors should design realistic scenario-based training (Sergevinn & Ross, 2012). Instructors are encouraged to develop scenarios based on the common circumstances and subject resistance addressed in this discussion. Conducting scenario-based training assists in honing skills, enhances an LEO's subject threat assessment and perception formation, enhances LEO decision making, and assists in practicing force responses to varying types of subject resistance. Overall, it assists the LEO by ensuring that they are responding to a circumstance through employing safety measures to reduce the risk of assault based on the type of subject resistance encountered. From this perspective scenario-

based training serves to improve the LEOs field performance and enhance their overall safety.

The research findings showed that working as a LEO and responding to varying types of calls, in varying types of locations and environments, and facing combative subjects continues to underscore the dangerousness of the job. Agency administrators should promote an organizational cultural of safety and provide their LEOs with reasonable policies, protocols, effective training, force options, equipment, and techniques in order for them to respond reasonably which can maximize their personal safety. Equally, it is incumbent on LEOs to integrate their training and commit to enhancing their own safety by employing safety protocols as they approach a subject on every call. Combing these collective efforts can work to mitigate the likelihood that the LEO will be a victim of an assault.

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