

The Norwegian police's use of conducted energy weapons

— a scientific evaluation of the CEW trial 2019–2020

Jonas Hansson, Miguel Inzunza
and Isabelle Stjerna Doohan



UMEÅ UNIVERSITY

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Preface

Both the role and scope of action of the police in society are ultimately regulated by legislation. This in turn affects police methods and their use in different situations. Police methods and working methods must be constantly reviewed and developed, and with the support of research, the police can strengthen their methods and increase the credibility, reliability, and legitimacy of their working methods. This report presents results from the evaluation of the trial activities with conducted energy weapons (CEWs) performed by the Norwegian police. The evaluation project began in December 2018 and lasted until 30 April 2021. It was funded by the Norwegian National Police Directorate.

The researchers who carried out the evaluation consisted of an interdisciplinary research group at the Police Education Unit, Umeå University, Sweden. Jonas Hansson, Miguel Inzunza, and Isabelle Stjerna Dooan are associate professors in the police education unit. Dr. Hansson acted as a project leader for the scientific evaluation. He was responsible for the design of the study, together with Dr. Miguel Inzunza. The researchers are jointly responsible for the report's structure, content, comparative analyses, conclusions, and recommendations.

An external reference group consisting of experts was attached to the project to provide advice and views on the project evaluation. Due to the Covid-19 pandemic, only one reference group meeting was conducted at the beginning of the project. The reference group consisted of Professor Liv Finstad, assistant chief of police Kenneth Berg, and police tactical commander Magnus Strande.

Thank you to the reference group and everyone who agreed to be interviewed, thereby sharing their perceptions, experiences, and views with us, and to those who responded to the survey.

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Jonas Hansson
Project leader

Author presentation

Jonas Hansson - Project leader

Associate Professor at the Police Education Unit at Umeå University. PhD in Public Health, Fil. Mag. in Education, trained police officer. Research interests include police officers and police work in relation to mental health, coping, stress, discretion, and resilience. Formerly, police officer; police supervisor; police field-training officer; and instructor in tactics, weapons, and self-defense.

Miguel Inzunza

Associate Professor at the Police Education Unit at Umeå University. His research interests are in behavioural science and criminology, with a particular focus on measurement issues. The area of application is mainly police work in both national and international projects. Dr. Inzunza is involved in several ongoing projects carried out at the Police Education Unit or in collaboration with other institutions and authorities.

Isabelle Stjerna Doohan

Associate Professor at the Police Education Unit, Umeå University. PhD in Disaster Medicine and M.Sc. in Peace and Conflict Studies. Research interests include police work, policing, legitimacy, and ethical aspects related to police work and crisis management. Teacher in the basic training programme for police officers and in independent courses in police work.

Summary

BACKGROUND: From an international perspective, recent years have seen an increase in the use of conducted energy weapons (CEWs), which are used to control potentially dangerous and uncooperative people. In 2019 the Norwegian National Police Directorate launched a two-year trial of CEWs in daily police work.

AIM: The purpose of the current study was to evaluate the National Police Directorate's CEW trial and to explore the public's perceptions of police use of CEWs.

METHODS: The evaluation was designed as a cohort study with a participant and a control group. Quantitative and qualitative data were collected. Measurements before, during, and towards the end of the trial activity were carried out. Two groups of police officers answered the survey: those who were part of the trial activities with CEWs and those who were not part of the trial activities. To deepen our understanding, we conducted in-depth interviews with police officers who had experience with CEWs. To examine legitimacy aspects from a citizen perspective, we conducted a survey with citizens on three occasions. We also conducted individual interviews with citizens and representatives of interest groups to deepen and complement the survey results.

RESULTS: The current study found that CEWs are mainly used against individuals who are mentally unstable and exhibit aggressive and dangerous behaviour. The findings showed that CEWs fill the gap between pepper spray or batons and firearms and complement other forcible means. The findings from the interviews showed that the officers could resolve the situations before the introduction of CEWs, but with CEWs they could do so with less intrusive force and a lower risk of injury. According to the interviews, the officers felt safer mostly because CEWs gave them the opportunity to intervene without discharging their firearms. The survey revealed no significant differences between the study and control groups or between different timepoints regarding threats to the police or injuries for the police or the counterpart, while the findings from the interviews showed that the police officers perceived a CEW-related decrease in the risk of injuries for both the police and their counterparts. Informants were unanimous that CEWs were effective, but that there were factors to be aware of when using CEWs, such as thick clothes and a moving target. More than 90% of CEW situations during the two-year trial involved male officers, and among subjects exposed to CEWs from the police, fewer than 10% were women. The citizen survey results indicate that citizens believe police officers can be trusted with decisions related to the use of force. The survey also showed that citizens who had received some information on CEWs were significantly more positive towards CEWs than those who had no information. Further, the group with information on CEWs also stated that they would feel more secure if police in their vicinity were equipped with CEWs.

CONCLUSIONS: CEWs do not seem to affect the Norwegian police's total use of force. However, CEWs can decrease the use of other forcible means, especially pepper spray. The findings indicate that CEWs can replace the use of firearms under certain circumstances, although they do not replace firearms as a means of force. CEWs do not seem to affect injuries among police officers and counterparts, although findings from the police interviews indicate a lower risk of major injuries and lethal force. The introduction of CEWs does not seem to have a substantial effect on public perceptions of the police and public confidence in the police. Members of the public trust that the police are well-trained and competent in making decisions regarding the use of CEWs.

KEYWORDS

conducted energy weapon; legitimacy; perspective taking; police; Taser; trust; violence

Introduction

Norwegian society has traditionally had a police force with a civilian character, with a focus on the population's rights and on core values such as legitimacy and trust. The legality of police work presupposes anchoring in law (NOU 2017:9). The overall goal of the Norwegian police's activities is stated in the Police Act (1995) § 1 second paragraph: 'The police shall, through preventive, enforcing and assisting activities, be a part of society's collective efforts to promote and consolidate citizens' legal security, safety and general welfare in general'. The police's legal right to exercise power is authorised by the Police Act § 6. A basic concept in the Norwegian legal tradition is that the police should not use stronger means than is proportionate to the particular situation; further, it is assumed that it is both trust-building and conflict-reducing that the police use violence only when absolutely necessary and avoid using strong law-enforcing means such as weapons (Norwegian Parliamentary White Paper No. 42 [2004-2005], 2005). Legality has a legal basis but also a dimension of trust, which follows from the social contract between the police and the public. The legitimacy of the police is conditioned by the population's trust in them performing the tasks that they are assigned and using only the methods and means of force that they are supposed to adopt when carrying out their duties (NOU 2017:9).

The use of force by police officers is often a source of debate and conflict between citizens and police officers (Katz, 2015; Rappert, 2002), and it is complex and ambiguous. In split-second decisions, police officers must consider their legal right to use force in dynamic and unpredictable situations. In addition to legality, the officers are expected to do the right thing by the citizens in society (legitimacy). We assume that different factors affect those often split-second decisions – stress, perspective taking, and anger management. Therefore, we have adopted different theoretical perspectives to better understand the use of force by the police.

The mission to maintain order is a complex one that requires a good balance in how to implement and maintain social order. An organisation such as the police is, to a large degree, dependent on maintaining good relations with the citizens to attain legitimacy. One such way is to adopt procedural justice, where the importance of being fair in the process of how police make decisions or exercise authority is a central part (Sunshine & Tyler, 2003). When implementing new strategies or methods, it is therefore important to consider several constructs, such as perspective taking, which are often referred to be central in considering the citizens' perspective, and especially in situations with complex encounters (Inzunza,

2015b; Inzunza & Wikström, 2020). Other areas that must be investigated are constructs associated with the specific work environment that provide the necessary conditions for police officers to perform well – for instance, how typically stressful situations are perceived by police officers, how these situations are affected by change, or how anger is managed during the change (Lawrence, Christoff, & Escamilla, 2017).

From an international perspective, over the last 20 years, there has been an increase in the use of 'less lethal weapons', which are used to take control of potentially dangerous and uncooperative people. Police outside Norway have tried a variety of such technologies, such as tear gas, pepper spray, distraction grenades, bean-bag rounds and kinetic impact projectiles (Pilant, 1993). A common, but somewhat controversial, less deadly weapon is the conducted energy weapon (CEW). The role of the police, their use of force and 'less lethal weapon' have been discussed and investigated in Norway in recent years (Bartland, Høivik, Myhrer, & Thomassen, 2017; Norwegian Parliamentary White Paper No. 42 [2004-2005], 2005; Norwegian Police University College, 2016; NOU 2017:9; Norwegian National Police Directorate, 2015). Until 2019, CEWs have not been used in Norway, but in 2019-2020, the National Police Directorate carried out a trial activity with them during police operations. The aim was to create the basis for a decision on whether the Norwegian police should potentially adopt CEWs. The pilot project has its background in the need that arose in the National Police Directorate after the temporary armament in Norway 2014-2016. It was necessary to explore alternatives to firearms, which also coincided with a similar government assignment from the Ministry of Justice and Public Security. During that period, the Norwegian Police University College (2016) published a report in which they considered that CEWs could not replace firearms fully as a conventional means of power. However, the report stated that in some situations CEWs could be a powerful and useful supplement to firearms and also an alternative to pepper spray and batons in other situations. After reviewing the legal framework, information on CEWs, and other countries' experiences, the report stated that there is no sufficient basis for decision-making to be able to assess what (milder) means of force the Norwegian police need. The report proposed further investigation of the Norwegian police's use of and need for force. In addition, a Norwegian government report (NOU 2017:9) recommended that CEWs should be tested within the police and that the trial must be followed by a scientific evaluation. Therefore, a scientific evaluation of the experimental activity with CEW was initiated, an assignment given to the Police Education Unit at Umeå University.

Objectives

The purpose of current study was to evaluate the National Police Directorate's CEW trial and to explore the public's perceptions of the police's use of CEWs.

The trial has been evaluated using an impact evaluation model, which is intended to establish the changes in outcome that can be attributed to a given intervention and whether the impact is as intended by the intervening organisation (ESV 2006:8, p. 12). One central aspect of an impact evaluation is the definition of 'impact'; for the purposes of the present study, we define it as 'a change of outcome as the result of an intervention' (ESV 2006:8, p. 9). In this study, we have investigated whether a correlation exists between the intervention (the introduction of CEWs) and the changes to perceptions and experiences of threats, violence, and injuries as well as the ability of police officers to perform their duties and the police's use of other means of force. We also investigated whether, and if so how, CEW use affects the police's self-assessed stress, safety and security, perspective taking, and contact with the public. Furthermore, we investigated the tactical challenges and advantages of using CEWs and any potential gender-based differences in their use. Finally, we examined public perceptions of CEWs.

The following questions have been addressed:

The police

- To what extent and in what situations are CEWs used?
- How does the introduction of CEWs affect other forceable measures and the overall use of force by police officers?
- How does the introduction of CEWs affect the ability of police officers to perform their duties?
- How does the introduction of CEWs affect police officers' perceptions of their own safety and security?
- How does the introduction of CEWs affect the extent of personal injury and lethal force – both among police officers and those directly affected?
- How effectively are CEWs perceived to achieve the purpose of their use, i.e. to subdue someone?
- Do the police experience any tactical challenges or advantages with CEWs?
- Do the answers to the study's questions vary significantly based on gender, age and experience of operational policing?
- How does the introduction of CEWs affect the attitudes of police officers to citizens?

Citizens

- How does the introduction of CEWs affect public perceptions of the police?
- Do members of the public perceive any change in the appearance of policing when officers carry CEWs?
- How do CEWs affect public confidence in the police?
- What do members of the public think about the police being provided with an additional tool?
- What do members of the public think about the police's use of force in general and of CEWs in particular?
- What do members of the public think of CEW use in relation to directly affected and vulnerable populations?

Conducted energy weapon as a tool

A CEW is a weapon that fires two darts attached to thin conductive wires delivering enough current to temporarily incapacitate someone by causing involuntary muscle contractions. CEWs work by disrupting nerve signals, which results in the loss of neuromuscular control (Axon, 2020). The Norwegian police are trialling the use CEWs of the brand TASER, which function by firing darts at the target/person. The darts are attached by thin conductive wires to a battery encased in a device with a pistol grip and trigger. When the darts fasten in the body, they create a closed circuit. CEWs administer approximately 20 brief electric shocks (pulses) per second. Initially, the pulses have a high voltage (approx. 50,000 V) in order to complete a circuit, but they have a very low current (1.3 mA). The voltage that reaches the person hit is between 800 and 1,200 volts. The pulses induce uncontrolled spasms in the skeletal muscles but do not affect other muscles such as the heart (Norwegian Police University College, 2018). It is important that the darts be well-spaced on impact in order to complete a circuit (Ho et al., 2012). The ideal distance is achieved if one dart sticks in the leg and the other above the waist in the abdomen, although hitting another part of the body will still be effective. Besides muscle contractions, the weapon also inflicts considerable pain. The maximum range of the CEWs used by the Norwegian police is 7.6 metres (Norwegian Police University College, 2018). In addition to firing the darts, the weapon also has two warning functions: a targeting laser and an electrical arcing that both sparks and crackles. The weapon can also be used by

holding it against the suspect and pressing the ARC warning function switch, causing an arc discharge across the front of the weapon – a function known as *drive stun*. This function does not cause muscle contractions in the same way as delivering the current from a distance via the darts, and any impact is achieved by pain alone (Norwegian Police University College, 2018).

The use of CEWs within the Norwegian police is regulated by the instructions on the use of CEWs in the police trial activity (FOR-2018-09-18-1648, 2018). CEWs can be used in: life-threatening situations; circumstances that may cause serious personal injury; when a service action cannot be performed without endangering the life of or causing serious injury to the police officer or other persons; when the use appears necessary, proportionate, and justifiable; and when more lenient means are presumably insufficient or inappropriate or have been tried unsuccessfully. When circumstances allow, the police officer must clearly encourage compliance with the order before using CEW and notify that weapons may be used if the order is not complied with. CEWs can only be used directly against the body (drive stun) when strictly necessary, and consideration must be given to where the person hit by the electrodes will fall. CEWs should not be used against persons with visibly poor general condition or against women who are clearly pregnant. Persons who have been exposed to CEWs shall, if necessary, have access to medical supervision.

Literature review

While several international studies have addressed the use of CEWs, their conclusions have not been entirely consistent; thus, further research is needed regarding this matter. As many studies have been conducted in the United States, where conditions vary from one police force to the next (Adams & Jennison, 2007), it is difficult to draw causal relationships between the use of CEWs and any impact on outcomes. Studies are also often financed by parties with a commercial interest in the manufacture, sale or marketing of CEWs (O'Brien & Thom, 2014). Azadani, Tseng, Ermakov, Marcus and Lee (2011) demonstrated that studies funded by TASER International or written by an author affiliated with the company are more likely to conclude that tasers – and by extension CEWs in general – are safe. According to Jauchem (2015), however, Azadani et al., (2011) used an overly simplified classification of what is safe. In addition, if the investigator has previously been funded by TASER International, there is a tendency to mistakenly assume that the company is also funding subsequent research, while this is in fact being conducted independently. Nevertheless, the body of empirical research on the use of CEWs is limited (Ariel et al., 2019), and they remain understudied use-of-force weapons (Somers, Terrill, Rossler, & Ingram, 2020). Dymond (2014) proposed that there is a need for more (and more contextualised) comparative research in the use of CEWs in the UK as well as for more publicly available statistics on the use of CEWs and other means of force.

In what situations are CEWs deployed?

In studies that have examined use of the CEW, it was found that more than 75% of incidents occurred indoors (White & Ready, 2010) and that more than 80% of the subjects were male and had an average age of 35 years (Lindberg, 2012). This research also found that almost one-fifth of the subjects were intoxicated at the time of the encounter and that most of them showed signs of mental instability. Approximately 95% of subjects displayed violent behaviour, particularly towards the officer, and 40% of subjects were armed (White & Ready, 2007; White & Ready, 2010). Brandl and Stroshine (2017) compared the use of pepper spray and CEWs by a large police force in the United States and reached two fundamental conclusions that confirm the findings of previous research: (1) pepper spray and CEWs are deployed under differing circumstances, and (2) generally speaking, CEWs are more effective than pepper spray. They highlight that CEWs are used twice as often as pepper spray during interventions involving people with mental illness. CEWs are also more commonly used when a suspect attempts to flee or is assumed to be armed. There was, however, no apparent difference between CEWs and pepper spray regarding the level of resistance. In terms of effectiveness, the only significant difference was related to the level of resistance

shown by the suspect. The study showed that CEWs were more effective than pepper spray in subduing resistance, i.e. the higher the level of resistance from the suspect, the less likely pepper spray was to be effective; contrarily, CEWs proved effective regardless of the level of resistance.

A study based on data from the New York City Police Department for the period 2002-2005 ($n = 375$) found that several factors affect the effectiveness of CEWs. The suspect's body weight, drug and alcohol use, violent behaviour, and the distance between the intervening police officer and the suspect are all significant factors that the researchers believe should be incorporated into guidelines and training for CEWs and other uses of force. They also noted that, while the debate generally focuses on the physiological effects of CEWs, this is not the focus of their study, which only examined one police department with a restrictive and carefully monitored use of CEWs, limiting the generalisability of the researchers' conclusions. What they did point out, however, is that the studied police department experienced positive outcomes while avoiding the current controversies associated with use and effectiveness of CEWs (White & Ready, 2010). Another US study found several discrepant findings in relation to prior research. For example, the police officers identified the probe mode as being less effective at gaining citizen compliance than the drive stun mode (Somers et al., 2020); due to its ability to produce neuromuscular incapacitation (NMI), officers are instructed to use the latter as a first option rather than former, even at a close distance (Axon, 2020; Police Executive Research Forum, 2011). Somers et al., (2020) found that CEW was less effective when used against males – a relationship that White and Ready (2010) did not find. An important finding from Somers and colleagues' (2020) study was that, with regard to the drive stun mode, male officers were over three times more likely than female officers to report effectiveness.

Adams and Jennison (2007) highlighted the issue of why CEWs are not used more often on those who commit serious crimes. The situations in which CEWs are used appear to involve individuals who become disorderly under the influence of drugs and alcohol or those suffering from mental illness. They also suggested that this may be one reason why the deployment of CEWs rarely leads to complaints from the public – those directly affected rarely recall events due to the effects of alcohol, drugs or psychotic state. Studies of the use of CEWs against people with mental illnesses are also few and far between (O'Brien & Thom, 2014). O'Brien and McKenna (2007) believed that the use of a potentially traumatising intervention – such as CEW – on a person with mental illness is something that they would like to see avoided. A recent study

by Hallett et al., (2021) explored the literature about the use of CEWs by the police when confronting people experiencing mental distress and found that this is relatively common; further, it reported that people experiencing mental distress may be subjected to more use of CEWs than the general population. One US study has examined disparities in the use of CEWs on people with and without mental illnesses, finding that those with a mental illness and/or under the influence of drugs were at greater risk of being subjected to multiple CEW shocks than those without a mental illness or not under the influence (Bailey, Smock, Melendez, & El-Mallakh, 2016). While Adams and Jennison (2007) claimed that the contextual nature and impact of CEW deployment makes it difficult to draw any general conclusions, they did allude to the importance of establishing a feedback loop to public authorities for data on and analyses of interventions, so that the experiences gained can be translated into guidelines and training, put back into practice and then analysed once again – something that they consider to be all too rare in many police forces.

In a British study, Dymond (2018) investigated the factors associated with CEW deployment in England and Wales in comparison to the United States and estimated the extent to which the use of force is affected by ‘who the citizen is’ contra ‘what the citizen does’. Unlike US studies, Dymond showed no significant association between ethnicity and the use of CEWs. Another difference between the UK and US was that an escalation in the level of threat – in this case, a citizen’s possession or use of a weapon – increased the likelihood of the CEW being fired, which was not the case in the United States. With regard to ‘who the citizen is’ and/or ‘what the citizen does’, the strongest association was between possession of a weapon and the deployment of a CEW, i.e. ‘what’. That said, the study also showed that CEWs were used more frequently against people with mental health issues, those under the influence of drugs and men in general, i.e. ‘who’.

The impact of CEWs on the use of force and other use-of-force measures

Although Adams and Jennison’s (2007) US study is more than 10 years old, it remains relevant, not least in view of the fact that the use of force is a complex issue. One salient point they made is that, if CEWs are placed in the use-of-force continuum early, they will be used more often; this is something that demands more training in decision-making given that so many different factors must be identified, processed, and analysed in a matter of seconds. They also discussed the fact that the use of CEWs is not limited to situations in which a higher level of force – i.e. firearms – would have been required, but they can also replace less forceful interventions such as control and restraint. They also noted that CEWs can be used instead of pepper spray or batons, for example in situations that would have required a comparable level of

force. They point to potential public relations problems that may arise if CEWs were used unsparingly to control situations in which, rather than dealing with dangerously violent individuals, the subject is simply uncooperative and poses no obvious threat to police officers. That said, they also believed that CEWs may often have a de-escalating effect, allowing officers to defuse a situation without the use of force – a scenario also mentioned by O’Brien and Thom (2014). In contrast, a recently published randomised controlled trial conducted in England and Wales showed that the deployment of CEWs leads to an increase in both the use of force by the police and assaults on officers (Ariel et al., 2019). The conclusion drawn by the researchers was that the presence of CEWs leads to increased aggression, as is the case with other types of weapons (Ariel et al., 2019).

Dymond (2020) considered the interplay between the human and the non-human (CEW) and proposed that the ‘other than human’ factors can influence discretionary decisions, arguing that technological innovation can influence decision-making, but that does not mean that it necessarily will. As an example, Dymond (2020) explains how CEWs can be used at a distance, and their ability to produce incapacitation may well make police officers safer. However, they may heighten the officer’s confidence and make them (1) interact with civilians in ways that can make them more aggressive and (2) interact with patrol patterns so that officers with CEWs are more likely to be single crewed and sent to more dangerous incidents, thus putting them at greater risk. Another study showed that less restrictive regulations on the use of CEWs are associated with an increase in the deployment of the weapon and a reduction in fatal shootings by police officers (Ferdik, Kaminski, Cooney, & Sevigny, 2014). Two further studies showed that more restrictive regulations of the use of CEWs are related to a decrease in the use of the weapon (Bishopp, Klinger, & Morris, 2014; Thomas, Collins, & Lovrich, 2010), although in one study, this was also related, if not significantly, to a lower level of deadly force (Thomas et al., 2010).

Injury risks associated with CEWs

It is now reasonably clear that CEWs in their current form are not in and of themselves lethal (Jauchem, 2015; Kunz & Adamec, 2019). That said, the use of CEWs in combination with risk factors such as pre-existing cardiac disease or long-term drug use (Strote & Range Hutson, 2006) may prove fatal. Certain mental conditions that can lead to elevated body temperature, confusion, aggressivity, and muscular symptoms (Blaho et al., 2000; Sztajnkrzyer & Baez, 2005) may well increase the risk of excited delirium syndrome; however, it is not clear whether such fatalities would have occurred even without the deployment of CEWs if, for example, pepper spray or control and restraint techniques were used. There is also a concomitant risk of fall injuries (Kroll, Adamec, Wetli, & Williams, 2016) and burns (Clarke & Andrews, 2014; Kroll,

Ritter, & Williams, 2017) when CEWs are fired as well as serious eye injuries (Kroll et al., 2018) and puncture wounds (Campbell & Clark, 2019; Lewis & Lewis, 2016) caused by the CEW's darts. An extensive study of the risk of fall injuries was conducted in the United States (White et al., 2013) by researchers affiliated to TASER International, with the aim of investigating the circumstances surrounding arrest-related deaths in which tasers were deployed between 2001 and 2008 ($n = 392$). White et al., (2013) contended that the most important factors they had identified in these cases were drug use and mental illness, the level of aggression and persistence of the suspect's resistance, and the large arsenal of force options available to police officers – all of which demonstrate the complexity of such incidents. While the focus had been on the deployment of tasers, the results of their study showed that, in many cases, this classification is a significant simplification of events. They also argued that reasoning regarding the implementation of tasers in policy-making, law enforcement and academic circles should not be reduced to 'taser cases' alone, but it should consider the total number of cases of arrest-related deaths – something that the authors of the study believed would improve the understanding of both the police's use of CEWs and the fatalities that occur in conjunction with police interventions (White et al., 2013).

A US study combining reports on the use of force with expert medical reviews that stratified the severity of injuries sustained found that, in relation to the number of calls for service they receive, the police seldom use force. Force is used in less than 1 in 1,100 calls for service and in less than 1 in 120 arrests; when it is used, officers most commonly rely on control and restraint techniques and CEWs. Among the suspects arrested, 98% had minor or no injuries as a consequence of such use of force. Serious injuries are normally associated with the use of firearms and canines, and approximately one-third of cases of arrest with serious injuries were unrelated to police use of force. No significant injuries resulted from over 500 uses of CEWs, leading the researchers to conclude that, if force is used, CEWs are the alternative least likely to result in serious injury for the suspect (Bozeman et al., 2018). A New Zealand study concluded that, over the period of analysis, the use of CEWs increased. In addition, the use of discharge mode increased compared with the show mode, and injuries sustained by police officers and their counterparts also increased (den Heyer, 2020).

In a US study, Terrill, Paoline Iii, and Ingram (2018) found that, although the majority of police departments studied had a written policy on the use of force and reporting requirements when force was used, there was no generally accepted use-of-force policy. The police officers in the study were perceived to be conservative in their view of what might be considered a reasonable level of force. Written guidelines proved significant with regard to the use of force, and the use of CEWs had an impact on the

likelihood of injury for both police officers and citizens. A study partially funded by Axon Enterprises, Inc. (Axon) found that CEW usage reduces subject injury and death by about 2/3 and that it has a fatal complication rate of ≈ 6.7 per million from uncontrolled falls and fume ignition. CEW has a non-fatal major complication rate of ≈ 6.4 per million. Penetrating eye injury appears to be the primary non-fatal major complication followed by rare, non-fatal major burns and a single case of permanent brain injury from a fall (Kroll et al., 2019).

Other studies conducted in the US and United Kingdom demonstrated a reduced risk of injury for both suspects and police officers when CEWs are deployed (Alpert, Smith, & Fridell, 2011; Jenkinson, Neeson, & Bleetman, 2006; MacDonald, Kaminski, & Smith, 2009; Smith et al., 2010; Smith, Kaminski, Rojek, Alpert, & Mathis, 2007; Taylor & Woods, 2010; Thomas et al., 2010), even if some deviations do occur. For example, Smith et al., (2007) demonstrated that the use of CEWs had reduced injuries for officers in one force but had no effect in another. MacDonald et al., (2009) found no correlation between the use of CEWs and police injuries, while Alpert and Dunham (2010) confirmed that the use of CEWs reduced the risk of injury for suspects. Meanwhile, others found results that were mixed and contradictory (Crow & Adrion, 2011). Studies such as MacDonald et al., (2009) found that CEWs reduced injuries for suspects in the United States; in the United Kingdom, Jenkinson et al., (2006) found that injuries for both police and suspects were lower when CEWs were deployed than when pepper spray, batons, or police dogs were used. Nevertheless, other studies demonstrate the downside. One showed an increased risk of injury for those on whom police use CEWs compared to other types of use of force (Terrill & Paoline, 2012); however, this study has been questioned by Kaminski, Engel, Rojek, Smith, and Alpert (2015), who contended that the measurement methods used by its authors are inconsistent with how injuries sustained from other types of use of force are coded and measured. They pointed out the negative consequences of including puncture wounds sustained from the darts of CEWs in the measurements. One of their conclusions is that such an overly expansive view of injuries may have a negative effect on the development of future technologies designed to reduce injury and save lives. One important factor that needs to be considered when reviewing CEW-related injuries is the situation in which the weapon is fired; in other words, what the alternative would have been had the police officer not had access to a CEW.

CEWs in Nordic countries

As far as we have been able to ascertain, only one Nordic scientific article dealt with the use of CEWs by the police. Rikander (2017) studied the use of CEWs by the Finnish police during 2016 and found that CEWs are an effective, appropriate use of force and that any injury to property and people has been limited/minor. Rikander (2017) also

pointed out that, in Finland, non-lethal means of applying force are not placed in any hierarchical order, meaning that control and restraint is not always considered the most lenient use of force considering how dangerous and powerful the resistance is, what other measures are available, and the expected outcome of the use of force. Regarding the use of CEWs, it was emphasised that police officers are professionals trained in the use of force and have a duty to choose the most appropriate forceable measure in any given situation. With regard to the use of drive stun, Rikander (2017) noted that this has been criticised, especially when used in police stations/custody facilities or against the same person several times. Rikander (2017) believed that this criticism should be taken seriously and given due consideration in both police training and internal supervision. He also pointed out that if the desired outcome cannot be achieved through the use of force, the use of force should cease, and consideration should be given to whether forceful intervention is necessary or if it would be better to postpone or abandon the intervention.

In 2018, the Swedish Police Authority launched a two-year trial of CEWs in Sweden. The trial was evaluated, and the study showed that the interview results point to police officers experiencing a decreased risk of violence – and thus injuries. However, the study could not draw any definite conclusions about how and to what extent using CEWs is associated with fewer injuries among police officers and counterparts. Furthermore, the study showed that access to CEW can increase one's sense of safety in situations involving violence, and that CEW might reduce the use of pepper spray, baton, and – to some degree – firearms (Ander et al., 2020). Ander and colleagues (2020) proposed that CEWs might facilitate the police officers' process of decision-making in relation to which tool to be used in encountering a high degree of threat and violence and thus have a de-escalating effect. Participants from the public emphasised that it is important to be aware of in which situations and towards whom CEW is used, although they expressed that CEWs are useful tools for the Swedish police (Ander et al., 2020).

Public perceptions of the use of CEWs by the police

Human rights organisation Amnesty International has been critical of the use of CEWs (Amnesty International, 2004). One of their subsequent reports (2018) in the Netherlands was highly critical of the Dutch police's use of CEWs – not least of the use of the drive-stun mode to coerce compliance through pain. In the report, Amnesty contended that in many cases, the use of the drive-stun mode is unlikely to provide the desired effect, that it amounts to cruel, inhuman or degrading treatment, and that – in view of its limited effectiveness – it implies a higher risk of repeated or prolonged discharge, thus increasing the risk of injury or death. They also contended that CEWs are deployed far too often and in situations

that do not warrant the weapon's use. The report also raised serious concerns about the regulation and supervision of and the lack of accountability from police officers for the use of CEWs (Amnesty International, 2018).

A Canadian study demonstrated that women, young people, and ethnic minorities are the groups least likely to support the deployment of CEWs by the police; further, people who identify as white are over three times more likely to support the police's use of CEWs than those who identify as members of an indigenous people or another ethnic group. The authors stated that, while the Canadian police in general enjoy strong public support, it is difficult to overcome such perceptions, irrespective of whether they have any basis in reality. This demands considerable engagement with these specific social groups (Oriola, Rollwagen, Neverson, & Adeyanju, 2016).

In a narrative literature review, Jauchem (2015) drew attention to a number of misapprehensions regarding CEWs that he believed to be important for researchers, expert medical witnesses, legal counsel, and anyone studying police statistics to be aware of. For example, he believed that associations between arrest-related deaths and CEWs are overestimated or exaggerated and that comparisons with electrocution – i.e. death due to electrical current – are misleading. According to Jauchem (2015), the assumption that all use of CEWs correlates to excessive force or torture is specious; indeed, the weapon can be a useful tool for police officers.

In a report on complaints and incidents involving the deployment of CEWs between 2004 and 2013, the Independent Police Complaints Commission (IPCC) – the oversight body for complaints against the police in England and Wales – wrote that there appears to be considerable public concern about the use of CEWs as well as limited understanding of how and why they are deployed (IPCC, 2014). There is an obvious disconnect between the public perception that CEWs constitute a high-level use of force that should only be considered when faced with the most serious threats of violence as well as the police's most frequent rationale for use, i.e. that the weapon presents a lower risk of injury than other uses of force such as pepper spray, control and restraint, or batons. The IPCC also acknowledged that CEWs are used more frequently by certain police forces but was unable to offer a logical explanation for this. The IPCC wrote that it was aware of cases where CEWs were said to have saved lives and reduced injuries – both of the public and the police. It did, however, highlight several areas on which the police should focus. It mentioned that while cartridge-off drive stun is no longer included in training, it is still being used, and it is important to ensure that the use of the drive-stun mode does not entirely replace other forms of conflict management, whether verbal or physical, given that the method generates a considerable number of complaints. The IPCC also observed that it is vital that

the process for selecting officers to undergo training for carrying CEWs be appropriate and that an important part of the process is understanding how training is translated into the operational use of CEWs. Guidance was also recommended regarding the deployment of CEWs against people with a mental illness and in situations where the suspect is already held in custody. Finally, the IPCC stated that monitoring and analysing CEW use locally plays a key role in ensuring that the weapon is not being used too readily and too often, especially given that their use appears to differ from one police force to the next.

In summary, international studies demonstrated that CEWs are useful tools that probably reduce the risk of injury to both those directly affected and police officers in comparison to other uses of force; however, at the time of writing, there is a lack of studies of the effects of CEWs in the Norwegian context. The National Police Directorate's decision to trial the use of CEWs provides a unique opportunity to conduct evidence-based monitoring and evaluation. As CEWs have not previously been deployed in Norway, it also offers an opportunity to measure the differences before and after deployment.

Methods and material

This is a quantitative and qualitative evaluation study including participants from the Norwegian police and citizens. This section describes the design of the evaluation, the different data collection methods with selection and procedures, and how the analyses of the data material have been conducted.

DESIGN

We aimed for the evaluation results to be based on high reliability and validity. The evaluation was designed as a cohort study with a participant and a control group, where each step in the evaluation was based on and complemented the other. Both quantitative and qualitative data were collected to provide a comprehensive picture of the effects of the trial with CEWs in police operations. Measurements before, during, and towards the end of the trial activity were carried out using a survey, which included questions about perceptions and experiences of violence and threats, injuries, use of other means of power, safety and security within the police, and the police officers' contact with the public. The survey was answered by two groups of police officers: those who were part of the trial activities with CEWs and those who were not part of the trial activities. To deepen our understanding, we conducted in-depth interviews with police officers who had experience of CEWs during the trial operation. To examine legitimacy aspects from a citizen perspective, we conducted a survey with citizens from the public on three occasions. We also conducted individual interviews with citizens and representatives of interest groups to deepen and complement the survey results.

The methods in this evaluation include both quantitative and qualitative data to be able to generalise the findings to some extent and to include a wider perspective on the use of CEWs in the Norwegian context.

CONTEXT

The Norwegian police consists of 12 police districts that have overall responsibility for police operations within a geographical area. There are about 10,000 police officers, of whom 33% are women (Norwegian police, 2020). Police officers from four police districts were included in the trial operation. The police officers who were part of the trial operation, who were thus trained and equipped with CEW, were 516 police officers in the police districts of Troms, Eastern, Southeastern, and Oslo (Beredskapstroppen, the national police tactical unit) (Table 3).

The Norwegian police divide their emergency police into categories. Police officers in category 4 are officers with basic police training. Emergency response personnel in category 3 are police officers provided with supplementary competence and training to handle more demanding armed missions, but they do not constitute a special unit. Emergency response personnel category 1 are police officers in Beredskapstroppen – the national police tactical unit (Delta) – which is a national assistance resource for the police districts, organised under the Oslo Police District. The police tactical unit has the competence to handle complex and difficult incidents such as hostage-taking, terrorist situations, and organised crime. Although this is a special unit, the crews are part of the ordinary crew force in Oslo and participate in the accomplishment of the daily police tasks when the unit does not practice or have assignments. Category 2 comprises personnel within the The Royal Police Escort and the Norwegian Police Security Service. The Royal Police Escort is organizationally subordinate to the Oslo Police District and is part of the national emergency response resources (NOU 2017:9).

Table 1. Summary of the involvement with the different data.

	Quantitative data 1	Quantitative data 2	Quantitative data 3	Qualitative data 1	Qualitative data 2
Collection	The survey to the police officers was developed with instruments previously developed by Dr Hansson and Dr Inzunza. Data was collected by the National Police Directorate and handed over to the research team	An existing instrument to the citizens was extended with items developed by Dr Inzunza. The data was collected from an external company and handed over to the research team	Information about documented use of CEW was collected by the National Police Directorate and handed over to the research team	Interviews with police officers were conducted by Dr Hansson and Dr Inzunza	Interviews with citizens and representatives of citizen organisations were conducted by Dr Stjerna Doohan and Dr Hansson
Analysis	All analyses have been conducted by Dr Inzunza	All analyses have been conducted by Dr Inzunza	All analyses have been conducted by Dr Inzunza	All analyses have been conducted by Dr Hansson	All analyses have been conducted by Dr Stjerna Doohan

Norwegian police are generally and normally unarmed, that is, in a normal situation, they do not carry firearms during the service. Permission for armament with firearms may be granted in accordance with further rules to emergency response personnel in the police districts. In addition to the Norwegian police being equipped with pistol and two-handed weapons, they are equipped with pepper spray, baton, and handcuffs (NOU 2017:9).

QUANTITATIVE DATA COLLECTION

The quantitative part of the evaluation includes three sets of data, each providing valuable information, data from police officers and citizens, and documented use of CEWs. The data from the police officers allow the study of eventual differences between the study group, which refers to the police officers being introduced and equipped with CEWs, and their colleagues working in similar work conditions but not using CEWs, who are referred to as the control group. The areas of interest with this set of data concern experiences of threat, violence, injuries, use of other weapons in relation to CEWs, perceived security, contact with members of society, and stress, among other areas. The value of data gathered from the citizens is to investigate how an external group, such as citizens, perceive the change of the police being equipped with CEWs. The third data material of documented use of CEWs allows for a more objective outline of the documented use of CEWs in the Norwegian context.

The first set of data was based on a survey conducted among all police officers participating in the evaluation. It included several areas of interest and was distributed by the National Police Directorate and made available to all participating officers in the evaluation of CEWs. Once the data had been collected, they were handed over to the research team after being anonymised. In total, there were just above 800 police officers allocated within the study group and the control group for each data collection.

The data from the citizens were collected using an external company. Based on a quota sampling method, data were collected from citizens by telephone interviews. An existent survey about the perceptions of the Norwegian police was expanded with items developed to provide information about opinions on the use of CEWs by the Norwegian police. The data were collected on three occasions – fall 2018, 2019, and 2020 – and included approximately 1,000 respondents for each data collection.

The third data set regarding the documented use of CEWs was compiled by the National Police Directorate as an ongoing documentation activity starting from January 2019. The data material is updated on a regular basis, and it includes each documented incident with CEWs. The material is divided in three sections: threat of use, use, and drive stun mode. Each registered incident provides information on police station, situation and demographics regarding the police officer involved.

Participants

Police officers

The overall response rate in 2018 was 556 police officers out of 819; in 2019, 452 police officers out of 827; in 2020, 509 police officers out of 827. For the purposes of this study when conducting cross-sectional comparisons, we defined an inclusion criterion that was robust in closeness to CEWs and used two variables for inclusion. We allocated respondents in the study group not only based on whether they self-identified as belonging to that group but also according to whether they had been trained with CEWs. The same procedure was adopted in the control group; participants were allocated in this group if they self-reported being in the control group and not having received training with CEWs. Respondents with a mixed answer patterns (i.e. self-reporting being in the study group but not receiving CEW training or being in the control but receiving CEW training) were excluded from these analyses. In 2018, police officers who met the criterion were 230 for the study group and 266 for the control group ($n = 496$); in 2019, 237 for the study group and 188 for the control group ($n = 425$); and in 2020, 272 for the study group and 208 for the control group ($n = 480$). The number of police officers was somewhat evenly distributed across the two groups.

We also asked police officers to voluntarily provide their badge number, since one important aim of the evaluation was to study change starting with the introduction of CEWs. The information was valuable to conduct repeated measures analyses with robust information with the same participant, providing data from all three measurements. Here we applied the same inclusion criterion with a minor change, where training with CEWs was only required to have been completed sometime during the three measurements. A total of 191 police officers – 104 from the study group and 87 from the control group – provided information on their badge and met the inclusion criterion. The distribution between study and control was somewhat even with these data. The numbers presented here provide the overall picture of the participation and inclusion criteria, but numbers in each analysis can differ since some may have missing data in a specific question (internal missing data).

Citizens

The data collected from the citizens were cross-sectional, and the number of participating citizens in 2018 was 1,024. In 2019, there were 1,005 citizens, and in 2020, the number increased to 1,145. The data were evenly distributed by gender but unevenly distributed by age, which was based on categories. In 2018, over 36% of the citizens were from the age category of 65 years and above, and 11% represented citizens below 34 years of age. In the data from 2019 and 2020, the categories had been changed, but a similar pattern could be seen whereby 45% were above 60 years of age, and less than 10% were below 30 years.

Instruments

The survey conducted among the police officers includes several parts, of which the first considers their demographics and questions related to their experience as police officers in terms of training. Age, gender, operational experience, and allocation in either the study group or control group are examples of such questions. One part considered a block of questions focusing on the safety and security of police work used in a previous evaluation of CEWs in the Swedish context (Ander et al., 2020). Valuable constructs in policing were also measured with different instruments, and cognitive empathy or perspective-taking, which is closely associated to the relation with citizens, was included in the survey (Inzunza, 2015a, 2015b). The items are based on processes vital for practicing perspective-taking, such as if the respondent tries to understand others. The response format was a 6-point Likert type scale with the alternatives *never* and *always*.

An adapted instrument was developed with hypothetical but possible scenarios named UFC by Inzunza during 2018. The purpose was to ask participants about what type of force they would use. The response format was a 5-point Likert scale based on probability. The intention was to determine whether the choice from the first data collection would change after the introduction of CEWs in the study group. Eventual group differences were also of interest.

Stress was measured with an instrument containing 42 items about stressors that police officers can be exposed to or experience in their duties. The questionnaire examines stressors that have their source in police work, the police work environment and stressors such as threats and violence against those in private life. The response format of the instrument is a scale from 0 to 9, with 0 meaning no stress and 9 meaning the highest possible stress (Ghazinoor, Padyad, & Hansson, 2021).

The management of anger and frustration was studied with the instrument Police Anger Questionnaire (PAQ) developed within a previous project, with police officers working in a complex and demanding context (Sundqvist et al., 2021). The response format is a 4-point scale with the alternatives *completely disagree*, *partially disagree*, *partially agree* and *completely agree*.

When collecting data among citizens, we had the possibility to add a limited number of items to an instrument that was already in use for collecting information about the citizens' perception of the police. Here we included items based on the procedural justice view of how to evaluate police performance (Nix, Wolfe, Rojek, & Kaminski, 2015), including 'The police can be trusted to have the competence to make the correct decisions on when to use force', 'make decisions regarding the type of force', or 'the amount of force'. If these questions were generic, we also added more specific items such as 'There

are situations I can imagine in which I would approve of a police officer using an electroshock weapon on an adult citizen'. The response format was a 5-point Likert type scale with the alternatives *strongly disagree* and *strongly agree*. An alternative of *do not know* was added (the respondents choosing this alternative were excluded from the analysis, if not too many). In the second year, 2019, we included new items to obtain more valid opinions from citizens regarding CEWs. We asked the citizens if they had received information about CEWs and focused on the opinions from those who answered affirmatively to the following item: 'During the past year, have you read or heard of cases where electroshock weapons have been mentioned?'. Then, we added items concerning citizens' general views of police equipped with CEWs and specifically in their living area.

QUANTITATIVE ANALYSES

A large part of the results will be presented through descriptive statistics with percentages and different charts. The differences encountered will be tested at the group level with chi square tests and other tests. Significant differences will be commented for their practical importance using Cramér's V, which stretches from 0, indicating no association, to 1, indicating a complete association (Walker & Maddan, 2008). Changes in the data that permit the comparison will be studied with factorial repeated measures of analyses of variance, and the main focus will be in the interaction effects (Field, 2009). Here we adopt a within design, which means that the same participant provides information on three occasions, and errors are reduced in the comparison to evaluate different participants.

QUALITATIVE DATA COLLECTION

The qualitative data collection was conducted in the spring of 2019 and in the autumn of 2020 until the spring of 2021, with the aim to follow up and deepen the understanding of the surveys' results. Qualitative data were collected through interviews with police officers, which were conducted after the preliminary analyses of survey data had been performed.

The selection for in-depth interviews with police officers was made through the CEW manager in the Norwegian police. The research group made requests to conduct interviews with police officers who had experience of using CEWs. In addition, we wanted the informants (used for references to interviews) to consist of both men and women of different ages and different lengths of service. We contacted police officers who primarily had experience of using CEWs. The interviews were based on their willingness to participate, and no one refused to be interviewed.

Interviews with police officers

In the spring of 2019, individual interviews were conducted with three male police officers, and in the autumn of

2020, six individual interviews were conducted with one female and five male police officers who had experience of using CEWs. The informants' ages were between 25 and 40, and the length of service was between 4 and 15 years. The informants were contacted through the CEW manager, and the interviews lasted one to one and a half hours. In 2019, the interviews were conducted face to face, while in 2020, due to COVID-19, the interviews were conducted through video. The different approaches are not considered to have played a role in the result. The interviews were semi-structured, recorded, and partially transcribed. Detailed notes were taken, the notes were then refined, and further details were added by the researchers who conducted the interviews.

Interviews were conducted with police officers (category 3 and 4) from three local police districts and police officers (category 1) from the police tactical unit (Beredskapstroppen). The interviews focused on experiences of using CEWs, perceptions, and experiences of threats and violence as well as perceptions of how the use of CEWs qualitatively and quantitatively affected threats and violence at work.

Interviews with citizens and representatives of the directly affected

Between November 2020 and February 2021, six individual interviews were conducted with Norwegian citizens (three women and three men). Three of the interviewed citizens were representatives of organisations (Amnesty, IOGT, and RIO) related to the directly affected (for example vulnerable populations, such as individuals with mental illnesses or drug addiction). Throughout the report, these informants are referred to as 'representatives'. These representatives were selected based on their knowledge and experience related to directly affected individuals, rather than their affiliation to a specific organization. With their knowledge and backgrounds they were able to offer an inside perspective into certain areas relevant to our evaluation. The informants, whose ages were between 20 and 60 years, were contacted through the Norwegian CEW manager. The interviews were semi-structured, and the question guide included questions such as 'How is it perceived that the police carry CEW?' and 'How is it perceived that the police use CEW?' as well as questions related to the citizens' safety, security and trust

in the police in relation to CEWs. Two researchers were present during the interviews. All the interviews were conducted via a video link and lasted approximately one hour; they were recorded, and detailed notes were taken. The notes were then refined, and further details were added by the researchers who conducted the interviews.

QUALITATIVE ANALYSES

Police officers

All analyses of qualitative data were based on the recordings and interview notes. The analysis of the interviews with the police was inspired by qualitative content analysis (Graneheim, Lindgren, & Lundman, 2017). The detailed notes in combination with the recordings were analysed and divided into condensed meaning units based on the study's questions. The meaning units were classified based on the perceptions, experiences and interpretations contained in the text. The meaning units were discussed and adjusted within the research group. Strengthening the reliability of the results, we use representative quotes from the interviews to illustrate the meaning units and their content.

Citizens and representatives

Interview data from the citizens and organisational representatives were analysed with thematic analysis (Braun & Clarke, 2006). The purpose of the analysis was to identify and describe thematic patterns in the interviews in relation to the purpose of the study. In a first phase, the data were reviewed and read through several times; in a second phase, repeated patterns in the material were identified through a systematic review in which the text was coded; in a third phase, the codes were compared with each other and sorted into potential themes. These themes were examined, refined and then named (to represent the core of each theme). There were three themes in total.

ETHICAL GUIDELINES

We applied ethical guidelines for social science and humanities research. The participants were informed of the purpose of the study and gave written consent to be included in the study. They were also informed about how the data material would be used (Swedish Research Council, 2011).

Results

This section begins with an account of the quantitative results from both surveys followed by descriptive statistics from the police records.

RESULTS OF SURVEYS WITH POLICE OFFICERS

In Table 2, we present information regarding the background and experience of the police officers included in the analyses.

Table 2. Self-reported demographics of participating police officers from each data collection.

		2018		2019		2020	
Total number police officers		496		425		480	
Study/Control		230 (46.4%)	266 (53.6%)	237 (55.8%)	188 (44.2%)	272 (56.7%)	208 (43.3%)
Age, mean, (sd)		32.89 (7.205)	34.36 (8.011)	34.41 (6.47)	36.18 (8.20)	34.93 (6.48)	36.61 (7.77)
Years of service, mean (sd)		7.21 (6.12)	8.67 (7.66)	8.97 (6.12)	10.48 (7.84)	9.02 (6.08)	10.74(7.41)
Experience from operational work mean		6.67(6.06)	7.82(7.23)	8.35(6.07)	9.64(7.45)	8.45(6.20)	9.97 (7.32)
IP Category	IP1	5 (1%)	0	6 (2.5%)	1 (0.5%)	12 (4.4%)	0
	IP3	90 (39.1%)	65 (24.4%)	95 (40.1%)	47 (25.0%)	101 (37.1%)	54 (26.0%)
	IP4	135 (58.7%)	201 (75.6%)	136 (57.4%)	140(74.5%)	159 (58.5%)	154 (74.0%)
Gender	Female	52 (22.6%)	60 (22.6%)	49 (20.7%)	45 (23.8%)	56 (20.6%)	44 (21.2%)
	Male	178 (77.4%)	206 (77.4)	188 (79.3%)	143 (76.15%)	216 (79.4%)	164 (78.8%)
Work schedule (last 6 month)	Daytime	28 (12.2%)	19 (7.2%)	28 (11.8%)	13 (6.9%)	29 (10.7%)	14 (6.7%)
	Evening	1 (0.4%)	0	0	0	0	0
	Night	1 (0.4%)	0	3 (1.3%)	0	1 (0.4%)	0
	Two-shift	25 (10.9%)	24 (9.1%)	31 (13.1%)	21 (11.2%)	43 (15.9%)	26 (12.5%)
	Three-shift	175 (76.1%)	222 (83.8%)	175 (73.8%)	154 (81.9%)	198 (73.1%)	168 (80.8%)

Note: sd=standard deviation.

Table 3. Self-reported group allocation and district from each data collection.

	2018		2019		2020	
	Study	Control	Study	Control	Study	Control
Beredskapstroppen	5 (2,2%)	0 (0,0%)	6 (2,5%)	0 (0,0%)	12 (4,4%)	0 (0,0%)
Finnsnes	12 (5,2%)	0 (0,0%)	13 (5,5%)	0 (0,0%)	10 (3,7%)	0 (0,0%)
Follo	23 (10,0%)	2 (0,8%)	29 (12,2%)	4 (2,1%)	31 (11,4%)	6 (3,0%)
Fredrikstad	25 (10,9%)	0 (0,0%)	22 (9,3%)	0 (0,0%)	29 (10,7%)	0 (0,0%)
Harstad	0 (0,0%)	12 (4,6%)	0 (0,0%)	9 (4,8%)	0 (0,0%)	6 (3,0%)
Haugesund_Karmøy	1 (0,4%)	42 (16,0%)	2 (0,8%)	29 (15,5%)	5 (1,8%)	31 (15,3%)
Indre Østfold	0 (0,0%)	17 (6,5%)	0 (0,0%)	12 (6,4%)	0 (0,0%)	8 (4,0%)
Jæren	0 (0,0%)	54 (20,5%)	0 (0,0%)	37 (19,8%)	0 (0,0%)	41 (20,3%)
Midt-Troms	0 (0,0%)	9 (3,4%)	1 (0,4%)	7 (3,7%)	1 (0,4%)	9 (4,5%)
Nord-Troms	0 (0,0%)	11 (4,2%)	0 (0,0%)	6 (3,2%)	0 (0,0%)	8 (4,0%)
Sarpsborg	5 (2,2%)	20 (7,6%)	6 (2,5%)	21 (11,2%)	8 (3,0%)	18 (8,9%)
Sauda_Suldal_Etne_Vindafjord	15 (6,5%)	2 (0,8%)	9 (3,8%)	0 (0,0%)	14 (5,2%)	1 (0,5%)
Skedsmo	5 (2,2%)	34 (12,9%)	5 (2,1%)	30 (16,0%)	6 (2,2%)	34 (16,8%)
Stavanger_Ryfylke	66 (28,7%)	56 (21,3%)	75 (31,6%)	29 (15,5%)	77 (28,4%)	38 (18,8%)
Stord	16 (7,0%)	0 (0,0%)	14 (5,9%)	1 (0,5%)	16 (5,9%)	0 (0,0%)
Tromsø	40 (17,4%)	4 (1,5%)	41 (17,3%)	2 (1,1%)	45 (16,6%)	1 (0,5%)
Ullensaker	17 (7,4%)	0 (0,0%)	14 (5,9%)	0 (0,0%)	17 (6,3%)	1 (0,5%)
SUM	230 (100%)	263 (100%)	237 (100%)	187 (100%)	271 (100%)	202 (100%)

Note: The missing participants provided no information on district.

RESULTS

All three data collections included 191 police officers who provided information on their badge number. These participants made it possible to study change during the trial period. Table 4 provides information of their demographics to enable us to determine whether they differ or are similar to the rest of the participants.

Table 4. Self-reported demographics of the 191 police officers participating in all three data collections.

		2018		2019		2020	
Total numbers police officers		191		191		191	
Study/Control		102 (53.4%)	89(46.6%)	104 (54.5%)	87(45.5%)	104 (54.5%)	87(45.5%)
Age, mean, (sd)		33.41 (6.45)	34.62 (7.67)	34.38 (6.39)	35.69 (7.75)	35.38 (6.39)	36.69 (7.75)
Years of service, mean (sd)		8.06 (6.08)	8.84 (7.66)	9.32 (6.17)	10.39 (7.93)	9.76 (6.10)	10.84 (7.81)
Experience from operational work mean		7.49(6.13)	8.10(7.38)	8.62 (6.07)	9.50 (7.46)	9.28(6.16)	9.98 (7.49)
IP Category	IP1	2 (2%)	0	2 (1.9%)	0	2 (1.9%)	0
	IP3	46 (45.1%)	28 (31.5%)	45 (43.3%)	30 (34.5%)	45 (43.3%)	30 (34.5%)
	IP4	54 (52.9%)	61 (68.5%)	57 (54.8%)	57 (65.5%)	57 (54.8%)	57 (65.5%)
Gender	Female	13 (12.7%)	16 (18.0%)	15 (14.4%)	17 (19.5%)	12 (11.5%)	16(18.4%)
	Male	89 (87.3%)	73 (82.0%)	89 (85.6%)	70 (80.5%)	92 (88.5%)	71 (81.6%)
Work schedule (last 6 month)	Daytime	14 (13.7%)	5 (5.6%)	15 (14.4%)	3 (3.4%)	8 (7.7%)	5 (5.7%)
	Evening	1 (1.0%)	0	0	0	0	0
	Night	0	0	1 (1.0%)	0	0	0
	Two-shift	12 (11.8%)	4 (4.5%)	12 (11.5%)	6 (6.9%)	19 (18.3%)	6 (6.9%)
	Three-shift	75 (73.5%)	80 (89.9%)	76 (73.1%)	78 (89.7%)	77 (74.0%)	78 (87.4%)

Note. There are some differences that are interpreted as being errors from filling out the survey.

The following figures (1-11) and tables (5-13) include data from the study and control groups from the three measuring timepoints (Table 2).

Sufficient training in different areas

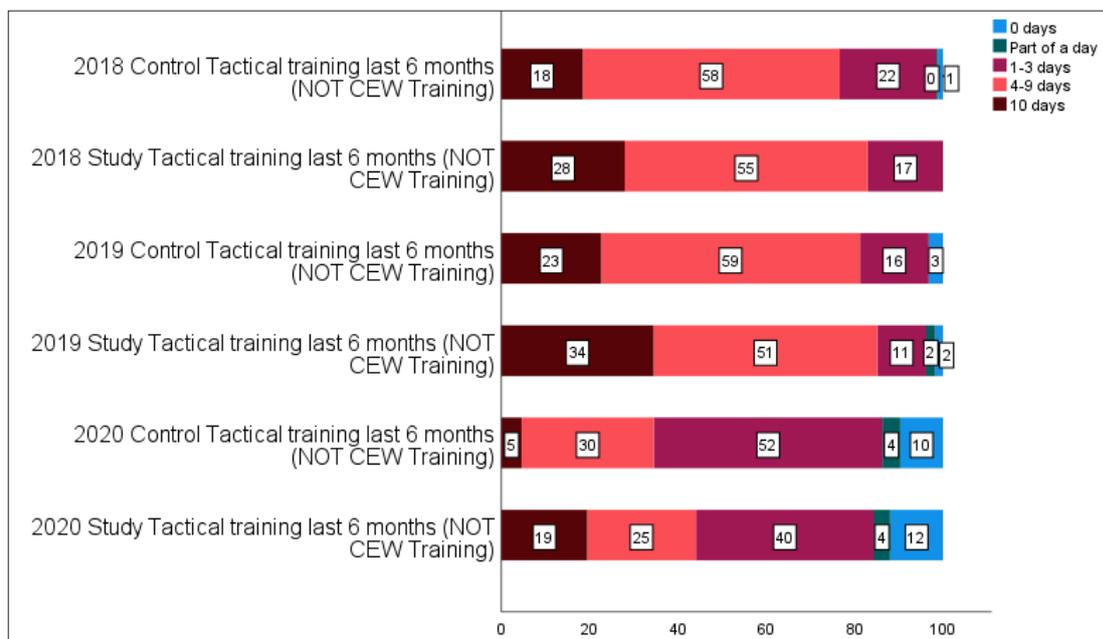


Figure 1. Question about Tactical training from three timepoints in percentage.

Tactical training shows a significant difference between the study group and the control group, with a Cramér’s V value of 0.15 indicating a low association. The study group reported more days of training.

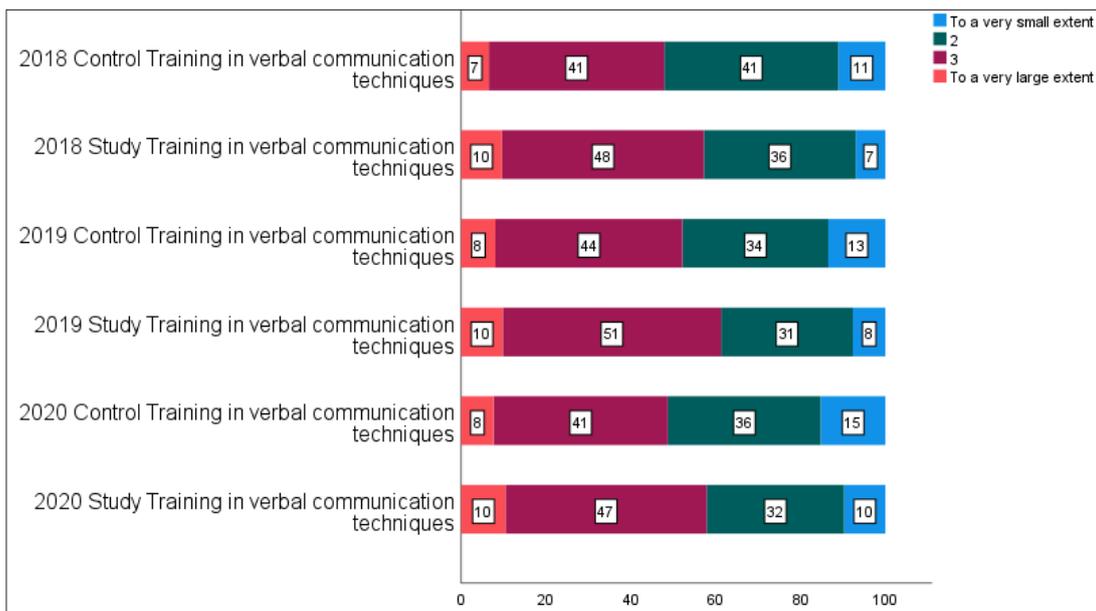


Figure 2. Question about training from three timepoints in percentage.

Training in verbal communication shows a significant difference between the study group and the control group, with a Cramér’s V value of 0.11 indicating a low association. The study group reported more verbal communication training.

Threats and violence

This block of questions concerned whether police officers experienced violence when in duty either by being exposed to it or by hurting a counterpart. Most police officers reported low level of such situations, as shown in Figure 3.

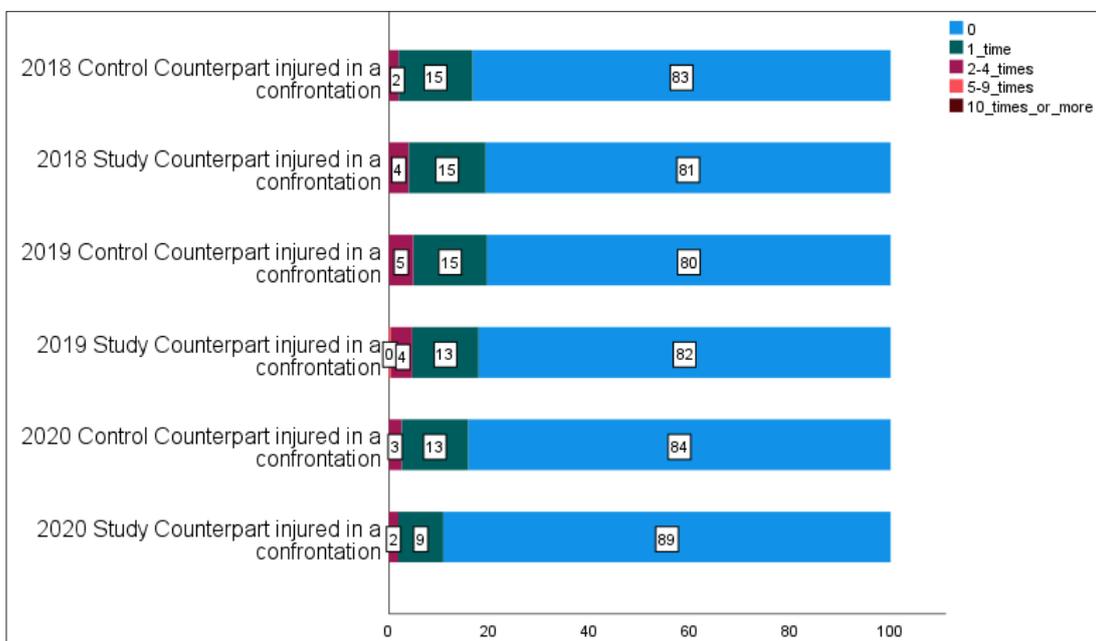


Figure 3. Question about injuries to counterpart from three timepoints in percentage.

We did not encounter any significant differences between the study group and the control group in this block of questions.

Use of force

Table 5. Self-reported use of different categories of force in 2018.

2018		used verbal communication techniques	used verbal force (orders and warnings)	used handcuffs	used transport and arrest methods (arrest technique)	threatened with the use of pepper spray	used pepper spray
	Mean	4,59	4,30	3,95	3,66	1,45	1,17
Study	N	228	228	228	228	228	228
	sd	0,842	0,985	1,101	1,171	0,814	0,458
	Mean	4,63	4,18	3,70	3,26	1,41	1,18
Control	N	256	256	256	256	256	256
	sd	0,797	1,041	1,231	1,140	0,714	0,459

The table presents which category of force is most commonly used in 2018 as measured in mean of responses. Six most commonly used categories are presented in order. A mean of 1 indicates 0 times, a mean of 2 indicates 1 time, a mean of 3 indicates 2-4 times, a mean of 4 indicates 5-9 times, and a mean of 5 indicates 10 times or more during the last six months.

Table 6. Self-reported use of different categories of force in 2019, study group.

2019		used verbal communication techniques	used verbal force (orders and warnings)	used handcuffs	used transport and arrest methods (arrest technique)	verbally threatened with the use of CEWs	aimed CEWs at a person	aimed at someone with the CEWs laser function	threatened with the use of pepper spray
Study	Mean	4,58	4,28	3,95	3,74	1,43	1,41	1,38	1,35
	N	232	232	232	232	232	232	232	232
	sd	0,927	1,058	1,106	1,137	0,673	0,671	0,626	0,687

In 2019, within the study group, those equipped with CEWs use them before pepper spray. The eight most commonly used categories are presented in order.

Table 7. Self-reported use of different categories of force in 2019, control group.

2019		used verbal communication techniques	used verbal force (orders and warnings)	used handcuffs	used transport and arrest methods (arrest technique)	threatened with the use of pepper spray	threatened with a gun	used pepper spray	threatened with the use of a baton
Control	Mean	4,61	4,27	3,89	3,48	1,58	1,27	1,19	1,17
	N	180	180	180	180	180	180	180	180
	sd	0,780	0,991	1,203	1,262	0,818	0,659	0,486	0,479

In 2019, with the control group show other categories such as gun and baton. The eight most commonly used categories are presented in order.

Table 8. Self-reported use of different categories of force in 2020, study group.

2020		used verbal communication techniques	used verbal force (orders and warnings)	used handcuffs	used transport and arrest methods (arrest technique)	verbally threatened with the use of CEWs	aimed at someone with the CEWs laser function	threatened with the use of pepper spray	
Study	Mean	4,56	4,15	3,71	3,41	1,35	1,33	1,31	1,20
	N	263	263	263	263	263	263	263	263
	sd	0,947	1,124	1,245	1,281	0,623	0,601	0,560	0,488

In 2020, the study group maintained the same order as in 2019.

Table 9. Self-reported use of different categories of force in 2020, control group.

2020		used verbal communication techniques	used verbal force (orders and warnings)	used handcuffs	used transport and arrest methods (arrest technique)	threatened with the use of pepper spray	actively used police dog to ensure control over person	used pepper spray	threatened with a gun
Control	Mean	4,47	3,95	3,37	2,95	1,41	1,17	1,14	1,13
	N	195	195	195	195	195	195	195	195
	sd	0,975	1,224	1,300	1,331	0,729	0,658	0,414	0,392

In 2020, the control group introduced the use of police dogs among the top eight; the alternative was introduced in the survey from 2019.

Effect of the different categories of use of force

Table 10. Self-reported effect with different categories of force in 2018.

	Study			Control			
	Mean	N	sd	Mean	N	sd	
used handcuffs	3,62	221	0,504	used handcuffs	3,60	245	0,560
used verbal communication techniques	3,45	226	0,550	used verbal communication techniques	3,48	253	0,546
threatened with a gun	3,42	52	0,893	used transport and arrest methods (arrest technique)	3,33	241	0,617
used transport and arrest methods (arrest technique)	3,40	219	0,577	used verbal force (orders and warnings)	3,27	252	0,555
used verbal force (orders and warnings)	3,32	225	0,530	threatened with a gun	3,20	55	1,112
threatened with the use of a two-handed weapon	3,21	34	1,149	used pepper spray	2,84	90	1,101
used pepper spray	2,93	74	1,038	threatened with the use of pepper spray	2,71	118	0,971
used punches and kicks	2,60	35	0,914	used punches and kicks	2,52	31	1,092
threatened with the use of pepper spray	2,53	95	0,955	threatened with the use of a two-handed weapon	2,48	31	1,235
threatened with the use of a baton	2,51	45	0,920	threatened with the use of a baton	2,48	50	1,147
hit a person with a baton	2,32	25	1,069	hit a person with a baton	1,53	19	0,841
fired aimed shots with a gun	1,71	7	1,254	fired warning shots with a gun	1,42	12	0,996
fired warning shots with a gun	1,33	6	0,816	fired aimed shots with a gun	1,10	10	0,316
fired warning shots with a two-handed weapon	1,33	6	0,816	fired warning shots with a two-handed weapon	1,00	10	0,000

Note: N varies depending on whether the police officer has used the approach category.

The table presents the effects that police officers reported for each different category of force used. A mean of 1 indicates low effect, and a mean of 4 indicates good effect.

RESULTS

Table 11. Self-reported effects with different categories of force in 2019.

	Study 2019				Control 2019		
	Mean	N	sd		Mean	N	sd
used handcuffs	3,63	221	0,594	used handcuffs	3,60	169	0,559
used verbal communication techniques	3,43	222	0,556	used verbal communication techniques	3,44	177	0,531
used transport and arrest methods (arrest technique)	3,40	221	0,637	used transport and arrest methods (arrest technique)	3,35	168	0,620
used verbal force (orders and warnings)	3,33	222	0,542	used verbal force (orders and warnings)	3,28	177	0,522
threatened with the use of a two-handed weapon	3,32	31	1,107	actively used police dog to ensure control over person	3,24	25	1,234
threatened with a gun	3,19	47	1,014	threatened with a gun	3,10	40	1,105
fired a CEW	3,03	33	1,311	threatened with the use of a two-handed weapon	2,94	16	1,289
aimed a CEW at a person	2,97	73	1,190	used pepper spray	2,87	62	1,048
verbally threatened with the use of CEW	2,96	84	1,135	threatened with the use of pepper spray	2,74	84	0,793
aimed at someone with the CEW laser function	2,91	77	1,216	used punches and kicks	2,63	27	1,115
used pepper spray	2,85	67	0,989	threatened with the use of a baton	2,62	34	1,074
used punches and kicks	2,76	33	1,091	experienced that your dog on his own initiative has defended you as a handler or himself	2,50	10	1,581
threatened with the use of pepper spray	2,67	91	0,857	verbally threatened with the use of CEW	2,00	10	1,247
actively used police dog to ensure control over person	2,64	14	1,336	aimed a CEW at a person	1,90	10	1,287
threatened with the use of a baton	2,60	40	1,033	aimed at someone with the CEW laser function	1,90	10	1,197
arched with a CEW	2,34	29	1,344	fired a CEW	1,86	7	1,464
hit a person with a baton	2,33	24	1,129	fired aimed shots with a gun	1,71	7	1,254
used a CEW drive stun mode	1,83	12	1,193	hit a person with a baton	1,23	13	0,439
fired warning shots with a gun	1,50	6	1,225	fired warning shots with a gun	1,00	5	0,000
fired aimed shots with a gun	1,00	5	0,000	fired warning shots with a two-handed weapon	1,00	5	0,000
fired warning shots with a two-handed weapon	1,00	5	0,000	arched with a CEW	1,00	6	0,000
experienced that your dog on his own initiative has defended you as a handler or himself	1,00	5	0,000	used a CEW drive stun mode	1,00	6	0,000

Note: N varies depending on whether the police officer has used each category.

The table presents the effects that police officers reported in 2019, and CEWs are now introduced in the study group. A mean of 1 indicates low effect, and a mean of 4 indicates high effect.

Table 12. Self-reported effect with different categories of force in 2020.

	Study 2020				Control 2020		
	Mean	N	sd		Mean	N	sd
used handcuffs	3,65	248	0,527	used handcuffs	3,61	175	0,595
used verbal communication techniques	3,58	256	0,562	used verbal communication techniques	3,52	188	0,561
used transport and arrest methods (arrest technique)	3,42	245	0,613	used verbal force (orders and warnings)	3,38	184	0,550
threatened with a gun	3,41	56	0,890	used transport and arrest methods (arrest technique)	3,33	167	0,689
used verbal force (orders and warnings)	3,41	256	0,530	threatened with a gun	3,29	41	1,101
threatened with the use of a two-handed weapon	3,38	37	1,063	used pepper spray	3,04	69	0,977
fired a CEW	3,35	34	1,098	actively used police dog to ensure control over person	3,04	24	1,367
aimed a CEW at a person	3,15	85	1,052	threatened with the use of a two-handed weapon	3,04	24	1,367
verbally threatened with the use of CEW	3,14	83	1,026	threatened with the use of pepper spray	2,63	91	0,939
aimed at someone with the CEW laser function	3,14	80	1,088	used punches and kicks	2,56	27	1,121
arched with a CEW	3,11	28	1,227	threatened with the use of a baton	2,51	37	0,961
used pepper spray	2,99	87	0,994	hit a person with a baton	2,14	21	1,195
used punches and kicks	2,86	36	0,899	experienced that your dog on his own initiative has defended you as a handler or himself	2,09	11	1,514
actively used police dog to ensure control over person	2,57	14	1,284	fired a CEW	1,90	10	1,449
threatened with the use of pepper spray	2,53	93	0,829	verbally threatened with the use of CEW	1,82	11	1,168
threatened with the use of a baton	2,49	39	1,023	aimed CEW at a person	1,80	10	1,317
hit a person with a baton	2,32	28	1,124	fired aimed shots with a gun	1,38	8	1,061
used a CEW drive stun mode	2,13	8	1,356	aimed at someone with the CEW laser function	1,38	8	1,061
fired aimed shots with a gun	2,00	8	1,414	fired warning shots with a two-handed weapon	1,25	8	0,707
fired warning shots with a gun	1,75	8	1,165	fired warning shots with a gun	1,00	7	0,000
fired warning shots with a two-handed weapon	1,71	7	1,254	arched with a CEW	1,00	7	0,000
experienced that your dog on his own initiative has defended you as a handler or himself	1,63	8	0,916	used a CEW drive stun mode	1,00	7	0,000

Note: N varies depending on whether the police officer has used the approach category.

Safety

In 2018, we found no significant differences between the study group and the control group for the different categories of use of force.

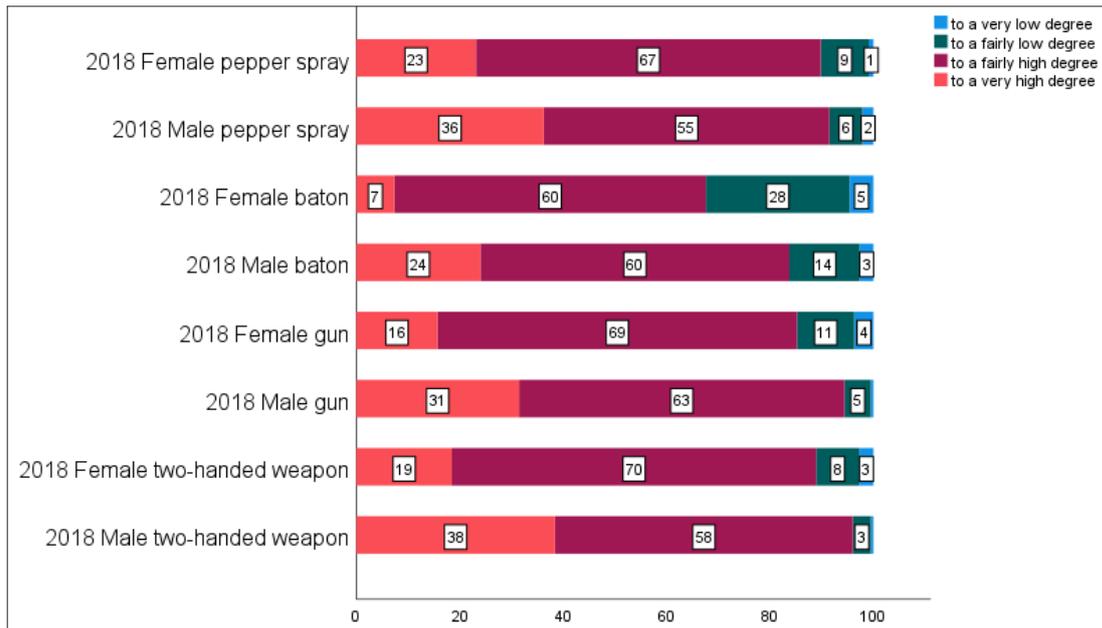


Figure 4. Question about feeling safe using different categories of use of force, represented in percentage, 2018.

A significant difference existed in gender 2018, where females reported feeling less safe in comparison to males when using weapons as a type of force. Cramér’s V values stretched from 0.13 to 0.22, indicating a low association.

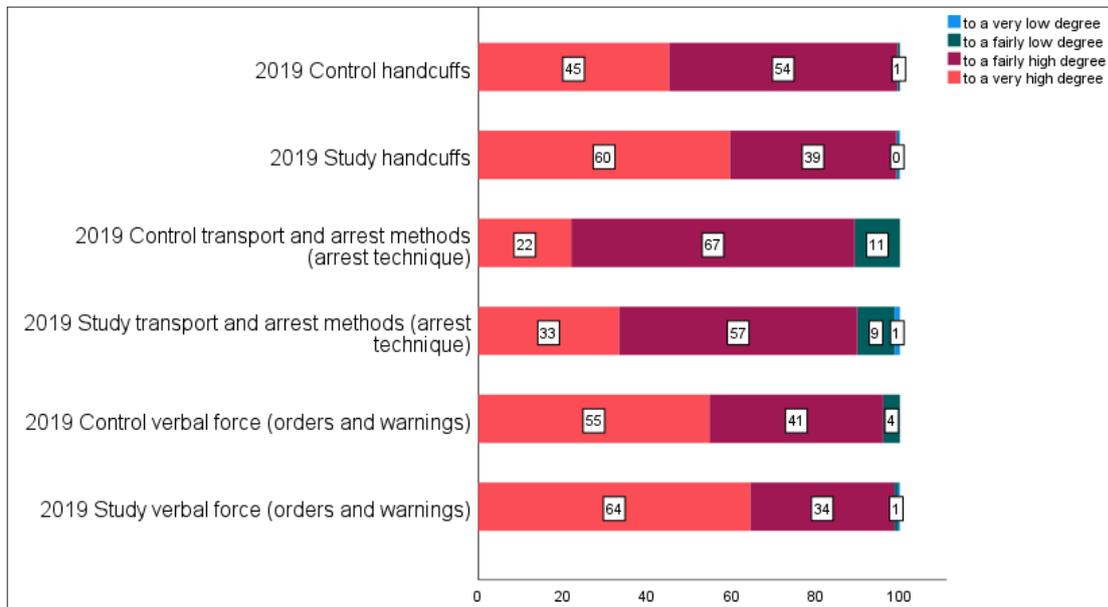


Figure 5. Question about feeling safe using different categories of use of force, represented in percentage, 2019.

The data from 2019 indicated significant differences between the study group and the control in three categories of use of force. Cramér’s V values stretched from 0.14 to 0.15, indicating a low association. The study group reported somewhat higher safety.

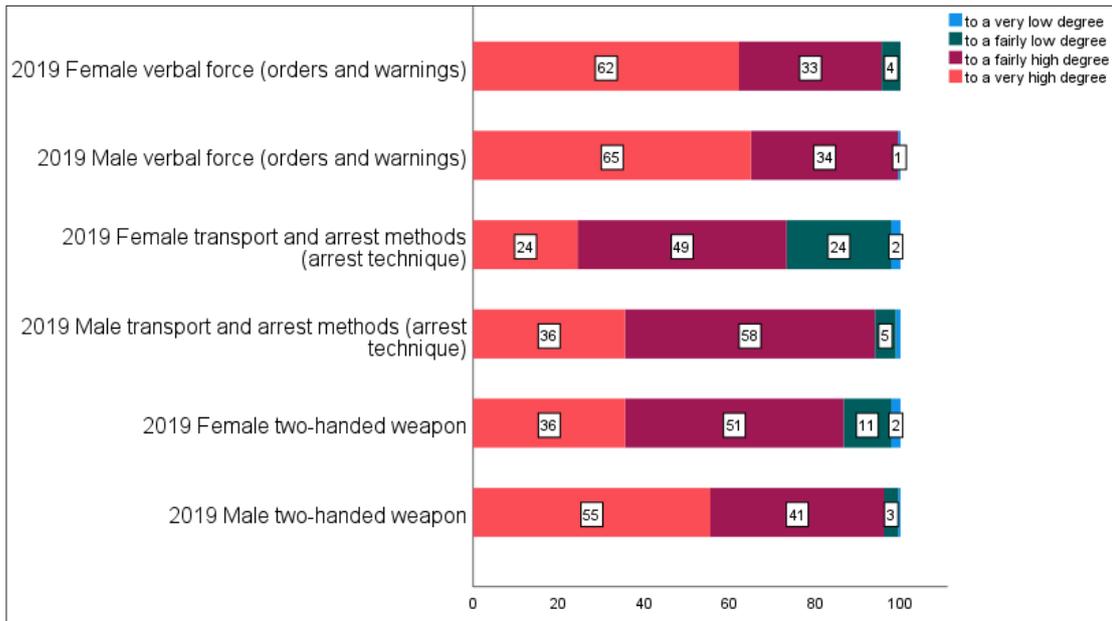


Figure 6. Question about feeling safe using different categories of use of force, represented in percentage, study group 2019.

In the data from 2019, CEWs were a new category within the study group. We encountered a significant difference in gender with a Cramér’s V value of 0.28 for transport and arrest methods, where men reported higher safety. No significant difference in gender was encountered for use of CEWs.

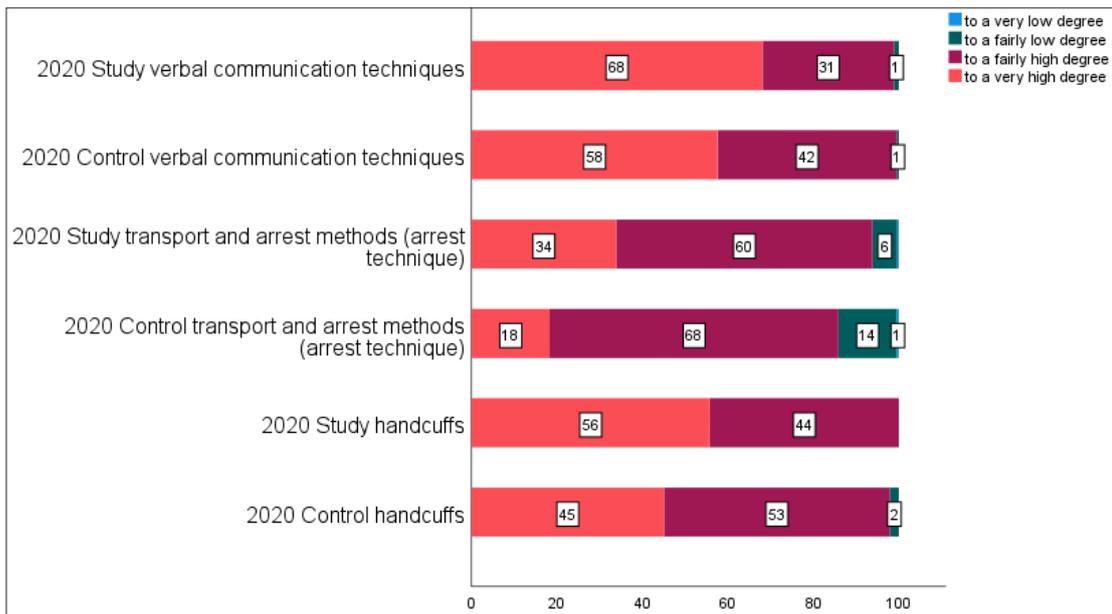


Figure 7. Question about feeling safe using different categories of use of force, represented in percentage, 2020.

The data from 2020 showed some significant differences between the study group and the control group, but they differentiated mostly between safety to a high or a very high degree, except for transport and arrest methods, with a Cramér’s V value of 0.20.

RESULTS

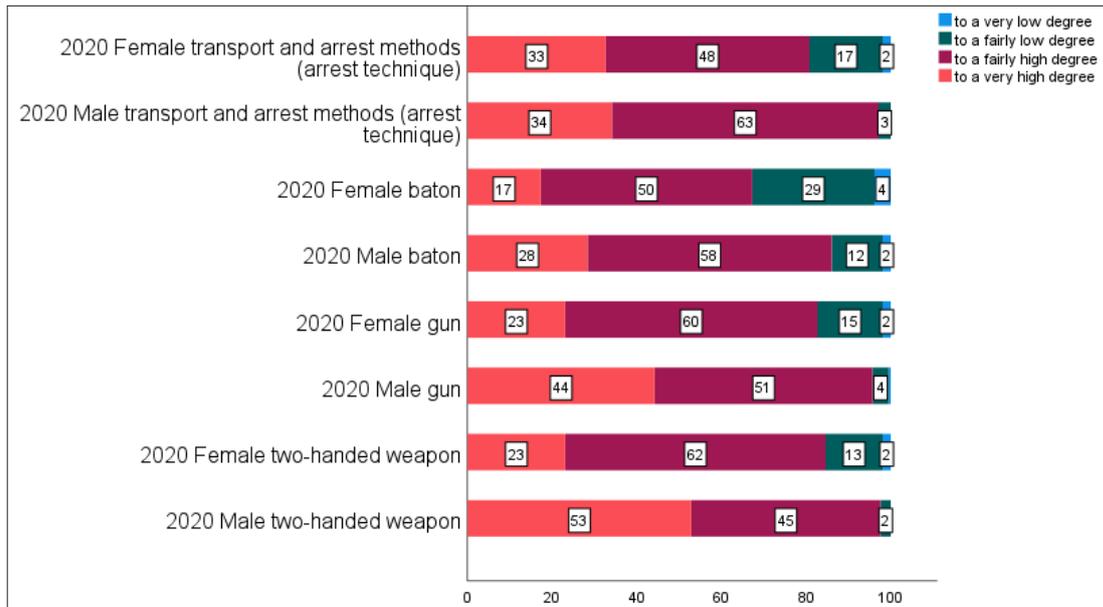


Figure 8. Question about feeling safe using different categories of use of force, represented in percentage, study group 2020.

The data from 2020 showed similar patterns as the previous years with regard to gender, with males reporting higher security than females regarding weapons as a use of force. We encountered significant differences where Cramér’s V values stretched from 0.20 up to 0.31 in transport and arrest methods, now indicating a moderate association where men reported higher safety. No significant difference in gender was encountered for use of CEWs.

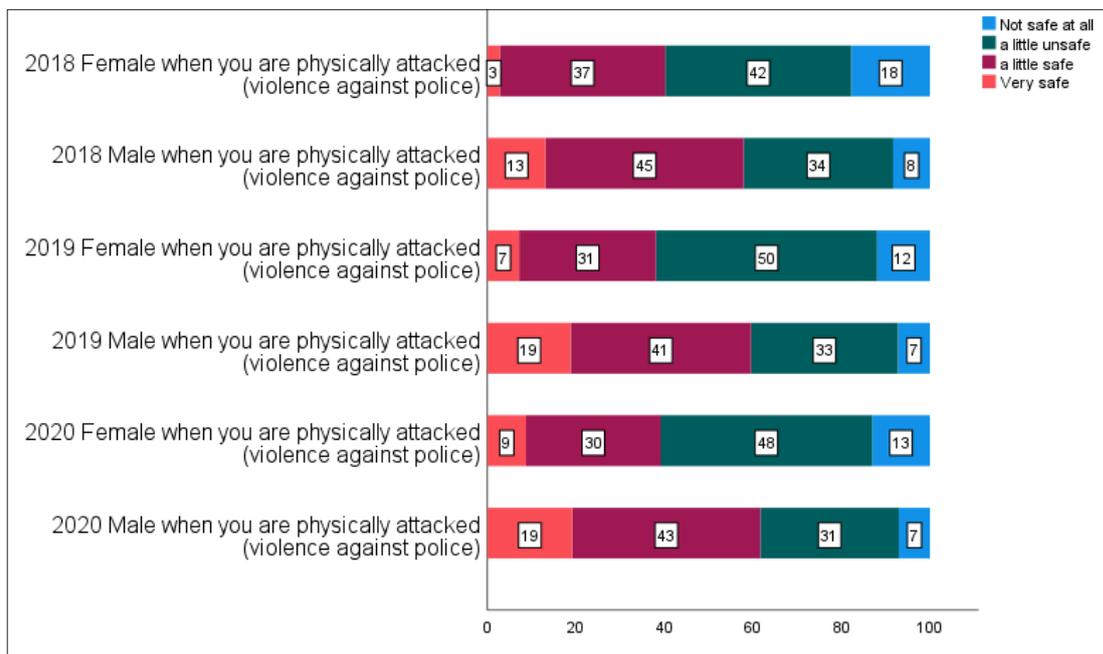


Figure 9. Question about perceived safety when there exist different levels of resistance, in percentage, gender-comparing all measurement timepoints.

When focusing on the level of resistance from counterparts, the reported perceived safety was not significantly different between the study and control groups throughout the implementation period. We found significant differences where females reported being more unsafe in comparison to males when physically attacked. This difference had values of Cramér’s V 0.19 to 0.20, indicating a low association.

Table 13. Self-reported preferred use of force technique in 2018-2020.

	2018 N=480		2019 N=403		2020 N=447			
verbal communication techniques	304	(63,3%)	verbal communication techniques	249	(61,8%)	verbal communication techniques	304	(68,0%)
verbal force (orders and warnings)	88	(18,3%)	verbal force orders and warnings	61	(15,1%)	verbal force orders and warnings	65	(14,5%)
transport and arrest methods (arrest technique)	22	(4,6%)	CEWs	21	(5,2%)	two-handed weapon	20	(4,5%)
two-handed weapon	20	(4,2%)	transport and arrest methods arrest technique	16	(4,0%)	CEWs	18	(4,0%)
handcuffs	18	(3,8%)	gun	16	(4,0%)	transport and arrest methods arrest technique	15	(3,4%)
pepper spray	13	(2,7%)	two-handed weapon	16	(4,0%)	handcuffs	9	(2,0%)
gun	15	(3,1%)	handcuffs	10	(2,5%)	pepper spray	8	(1,8%)
			pepper spray	9	(2,2%)	gun	4	(0,9%)
			police dog	5	(1,2%)	police dog	4	(0,9%)
Total	480	100,0%	Total	403	100,0%	Total	447	100,0%

Note: CEWs are mostly available for the study group in 2019 and 2020.

The table shows the order of use of force techniques that police officers felt most safe with in comparison to other alternatives. The pattern was similar between groups and measurement timepoints.

Another area studied was the perceived difficulty to choose the use of force in different situations. We encountered no differences at the group level. The trend was that serious situations were slightly more complex, but the police officers reported no particular difficulties in this area.

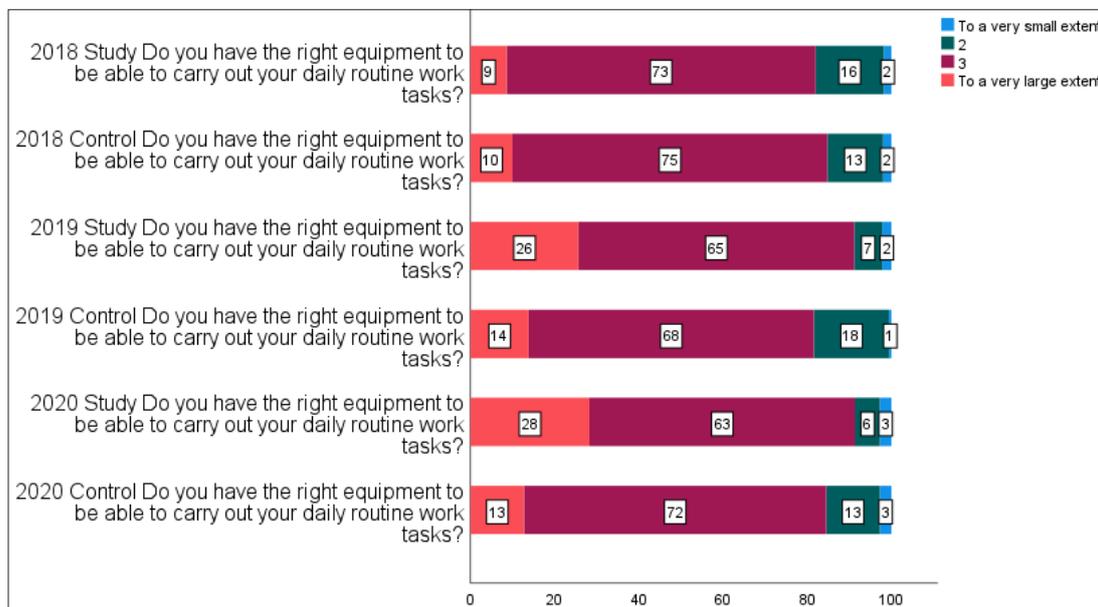


Figure 10. Question about equipment for daily routine tasks, in percentage, study-control, all measurement timepoints.

A statistically significant difference existed in having the necessary equipment to perform daily tasks. The study group reported that they had the right equipment to a higher extent than the control group, and the Cramér’s V value increased to above 0.20 from 2019, indicating a low association.

Decision-making/Preference in use of force

To understand more about decisions regarding the use of force in more specific situations, we used the UFC instrument, developed by Inzunza in 2018. Our intention was to study preferences on the use of force to stop a person when verbal orders and warnings had no effect and to detect eventual differences between the two groups (study group and control group) after introducing CEWs. The participants were asked to respond regarding the likelihood of choice between different use of force methods – some basic and some more complex – to take control in hypothetical situations. The different methods to stop a person at the baseline in 2018 were use of physical means, use of a gun, use of a baton, and use of pepper spray. The response format was a 5-point Likert scale ranging from 1 (*not likely*) to 5 (*most likely*). In 2019 and 2020, two alternatives were added, namely the use of a police dog or of a CEW; a basic situation requiring such methods may involve, for instance, an adult person trying to escape after being stopped by the police. Both groups agreed that physical means were the most likely method to use, while using a gun was the least likely. A control question was also included, where respondents had to rank the first choice and last choice if eventual inconsistencies in likelihood were encountered, but the likelihood items provided a good overall view.

If the situation with a person escaping was straightforward, a more complex situation could involve someone reacting with a form of violence, such as punching. In this case, the results still indicated that the most likely choice was physical means (75% for the study group and 84% for the control group), but pepper spray (51% and 58%, respectively) and batons (35% and 32%, respectively) were also the most likely choice for some of the respondents. The percentage represent how many respondents choose the most likely alternative in each use of force category. So 75% in the study group answered that this was the most likely choice of use of force in a situation with a person escaping. While the other categories had lower percentage being chosen as the most likely alternative.

A more serious situation, such as where a person would be threatening with a knife, showed that using physical means was not an alternative, indicated by the high percentage of *not likely* (62% for the study group and 54% for the control group). Using a gun was now an alternative indicated by the high percentage of *most likely* (28% and 29%, respectively); although the use of batons reported similar percentage levels in both groups (25% and 27%, respectively), pepper spray were the preferred alternative, with a concentration in *most likely* (56% and 59%, respectively). We encountered no significant differences between the groups in 2018.

In 2019, as CEWs were in use, we wanted to evaluate where it was used as an alternative in the study group,

and if the control group showed similar patterns to 2018. In a situation involving a person escaping from the police, physical means was the method used by both groups. In the case of a person reacting with punches, the study group would choose physical means to a lower degree (68%), while the control group would maintain the same level as before (77%). The use of batons was also lowered in the study group (25%), but it was at a similar level in the control group (38%). The likelihood of using pepper spray was at a higher level in the study group (45%) but even higher in the control group (66%). The new alternative with police dogs was chosen by 28% of the study group and 39% of the control group; however, few had this possibility in the study group ($N = 54$) and in the control group ($N = 33$). The alternative of using CEWs was chosen by 54% of the study group. Thus, if the likelihood was still the highest for physical means when confronting a person punching, the second alternatives were now CEWs in the study group and pepper spray in the control group.

In the situation with a person threatening with a knife, the same pattern existed as in 2018: 67% of the study group and 60% of control group reported not using physical means, with 50% and 58% choosing the alternative use of a gun, respectively. Batons were now not likely to be used by both groups choosing *most likely* (11% and 20%, respectively). The use of pepper spray was still high in the control group (58%) but lower in the study group (31%). The few respondents having police dogs ($N = 26$) in the control group had also chosen the most likely alternative (46%) in this situation. However, the main difference existed in the concentration, with the most likely alternative being CEWs in the study group (92%). We also detected a different pattern with the control group in comparison to 2018, where guns or pepper spray were both equally likely to be used.

In 2020, the method most likely used by both groups with a person escaping was physical means. When a person was punching, the reported choice for physical means was similar to 2019 (67% in the study group and 79% in the control group), with the control group reporting the higher percentage. The reported percentage of using batons was lower in the study group (29%) than the control group (52%). The percentage in the control group had increased since 2019. The same pattern as in 2019 was seen with pepper spray, which was 47% in the study group and 71% in the control group. As an alternative, police dogs reported a lower percentage in both groups (10% and 13%, respectively). The percentage of respondents in the study group (60%) choosing CEWs as the most likely alternative was higher in 2020 compared to 2019.

In 2020, the situation involving a person threatening with a knife provided similar percentages. Those *not likely* to use physical means existed in both groups (64% in the study group and 56% in the control group). The percent-

ages of those *most likely* to use a gun were similar (49% and 55%, respectively). The use of baton had decreased in the study group (9%) and increased in the control group (24%). A similar pattern was seen with pepper spray, with the *most likely* alternative being lower in the study group (28%) and even lower in the control group (52%) than in the previous year. The *most likely* alternative of using a police dog was lower in 2020 (6% in the study group and 10% in the control group), based on a few respondents. CEWs were again the preferred alternative, with a concentration of 88% in the study group. A difference compared to 2019 existed in the control group with regard to how to handle a situation involving a person with a knife; here, the most likely choice was the use of guns instead of pepper spray. We detected significant differences in 2019 and 2020 between the groups related to the introduction of CEWs.

Stress

To further understand stress in work-related situations, we used the Police Stressor Identification Questionnaire (PSIQ) instrument. Our intention was to determine whether there was a change in how different situations were perceived during the introduction of CEWs, and the focus of these analyses concerned eventual differences between the study group and the control group. In 2018, the following level of stress was reported in each of the 42 items (stressors) of the instrument.

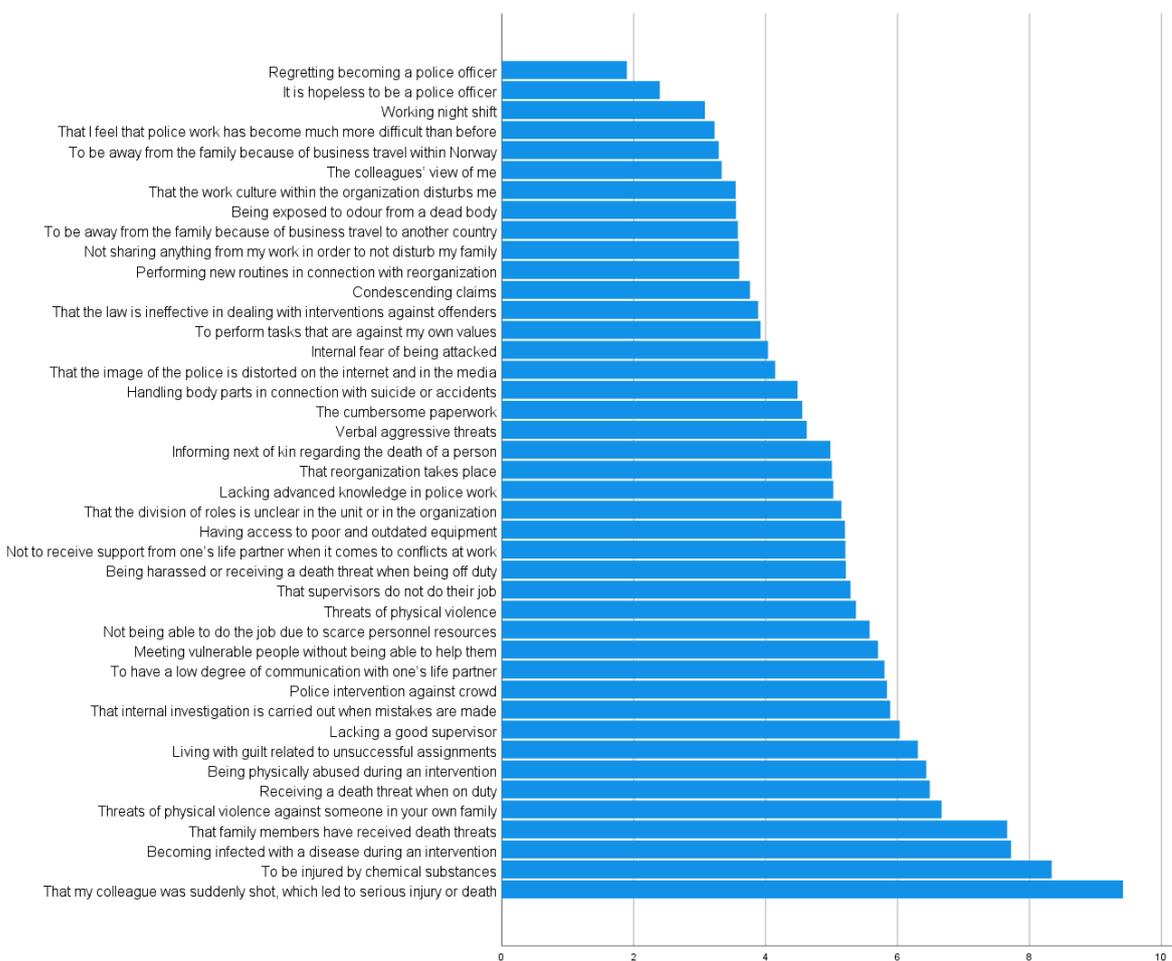


Figure 11. Reported mean level of stress in 2018 based on all participants (n = 415).

RESULTS

When studying group differences and changes between 2018 and 2020, we used the data gathered from 191 respondents. We found a significant interaction between the two groups in the item 'Police intervention against crowd'. The change in the reported stress was a decrease in the study group compared to the control group. This may suggest that the stress related to intervening in crowds had decreased in the study group with the introduction of CEWs. This pattern differed from the increase in reported stress within the control group (see Figure 12).

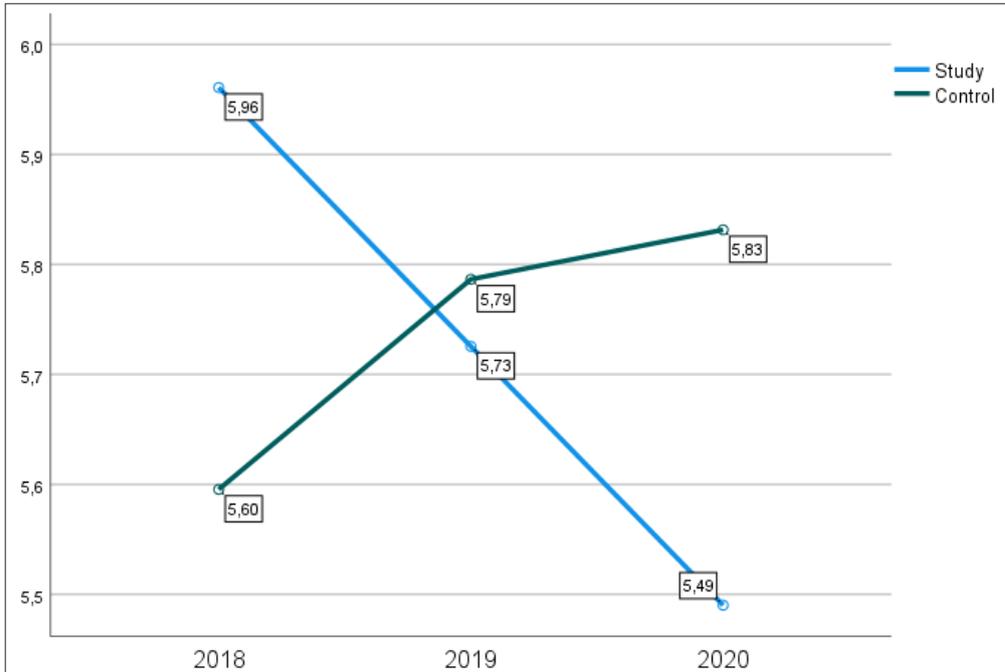


Figure 12. Stress related to intervening in crowds between 2018 and 2020: Difference between study group and control.

Another significant interaction, indicating a different change between the two groups, was also present in the reported stress with the item 'Injured by chemical substance'. Although we detected no significant change in the study group, it increased in the control group between 2018 and 2020.

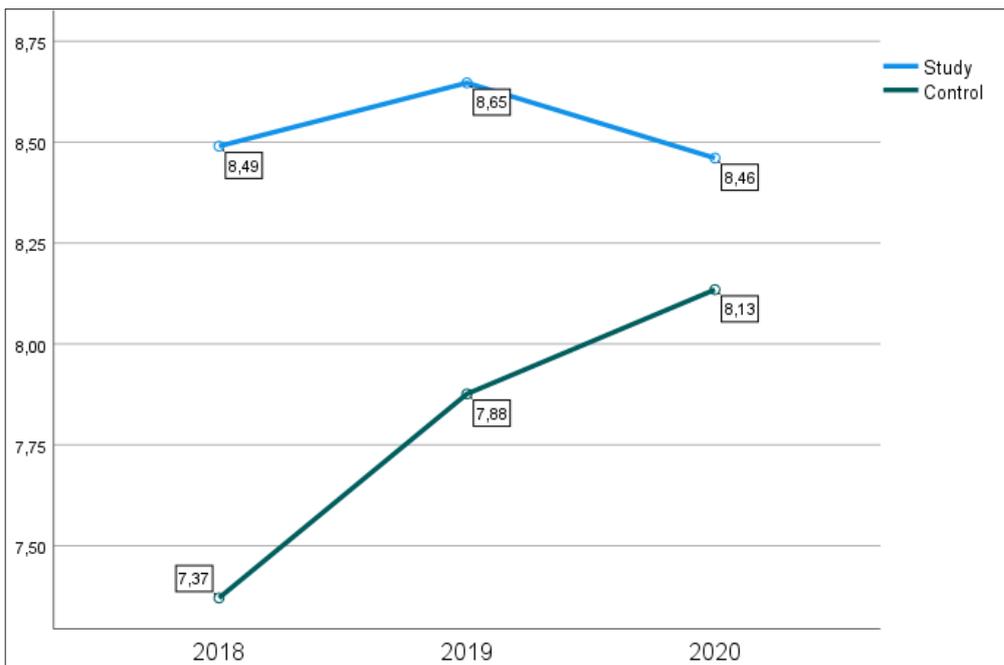


Figure 13. Stress related to being injured by chemical substance between 2018 and 2020: Difference between study group and control.

Other findings not related to CEWs were also detected, such as both groups having an increased pattern in stress when working during the night, indicated by the item ‘Working night shift’. Within the same area of stressors, the control group reported increased stress ‘to be away from the family because of business travel within Norway’, while the study group reported no change. A similar pattern was seen in the item ‘My colleagues’ view of me’, with increased stress within the control group and no change within the study group. An item such as ‘Being harassed or receiving a death threat off duty’ increased the reported stress within both groups.

Anger management

To understand how the respondents manage their anger and frustration, we included the Police Anger Questionnaire (PAQ) instrument. Our intention was to determine whether the introduction of CEWs would influence the management of upsetting feelings, and the focus of this analysis concerned, once again, any eventual difference between the study group and control group. We detected no significant change.

Contact with citizens

Two questions concerned the relation between police and members of society. We encountered no differences at the group level, and the responses showed that most respondents considered the relations to be good or very good.

Perspective taking

An analysis with the data based on 191 participants was used here to investigate whether the construct perspective-taking (PT) was stable from measurement 1 to measurement 3, and whether there were gender-based differences or differences at the group level between the study group and the control group. The construct was based on five items considered as suitable indicators of PT, adopting latent variable modelling. The methodology and findings will be available in upcoming publications from Inzunza (paper in progress).

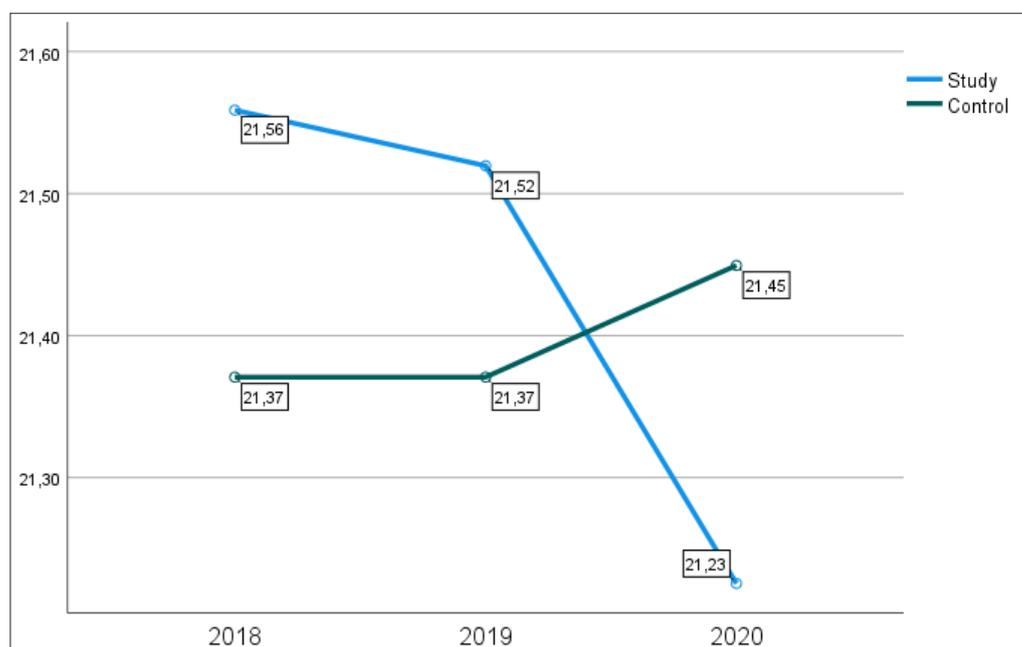


Figure 14. Change in PT between 2018 and 2019: Difference between study group and control.

The line chart indicates a change between the groups, where the study group had a decline from 21.56 to 21.23 between 2018 and 2020. The decline is not significant, which is also indicated by the means ranging from approximately 21.20 to 21.60.

RESULTS OF SURVEYS WITH CITIZENS

The following charts present the distribution of citizens' opinions of police use of force in general.

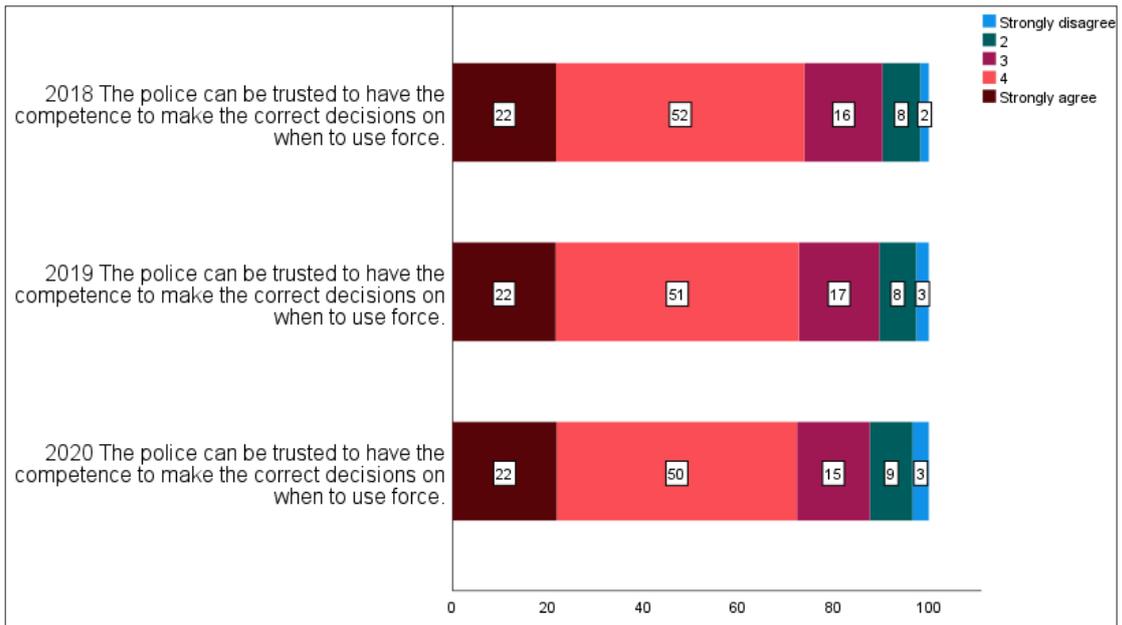


Figure 15. General question about correct decisions from three timepoints in percentage.

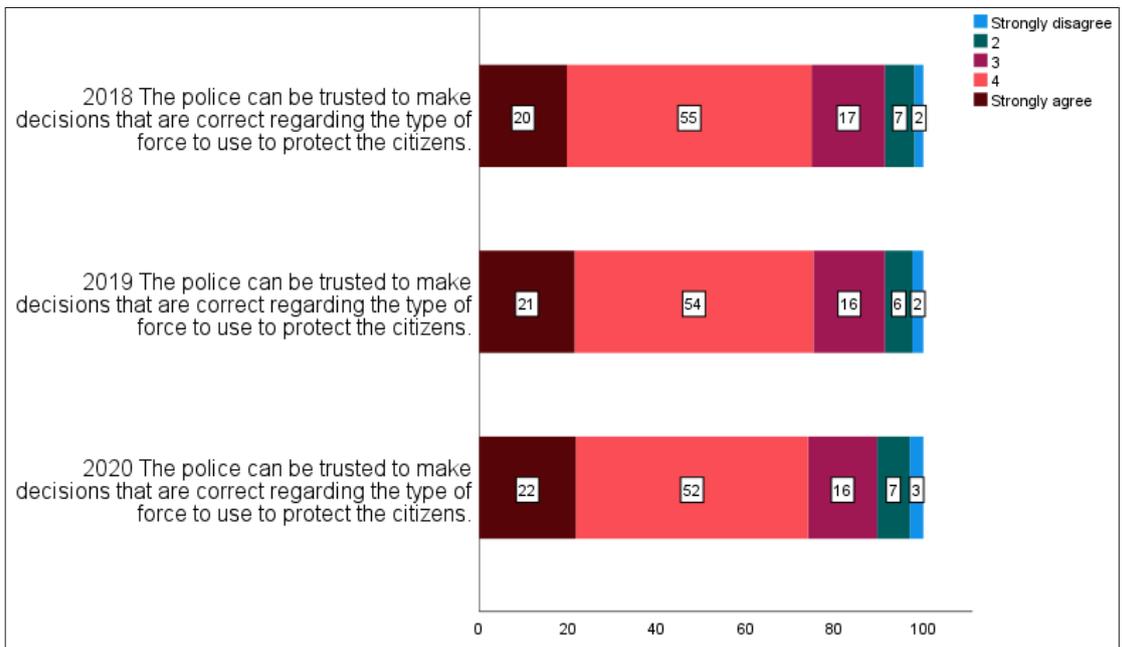


Figure 16. General question about type of force from three timepoints in percentage.

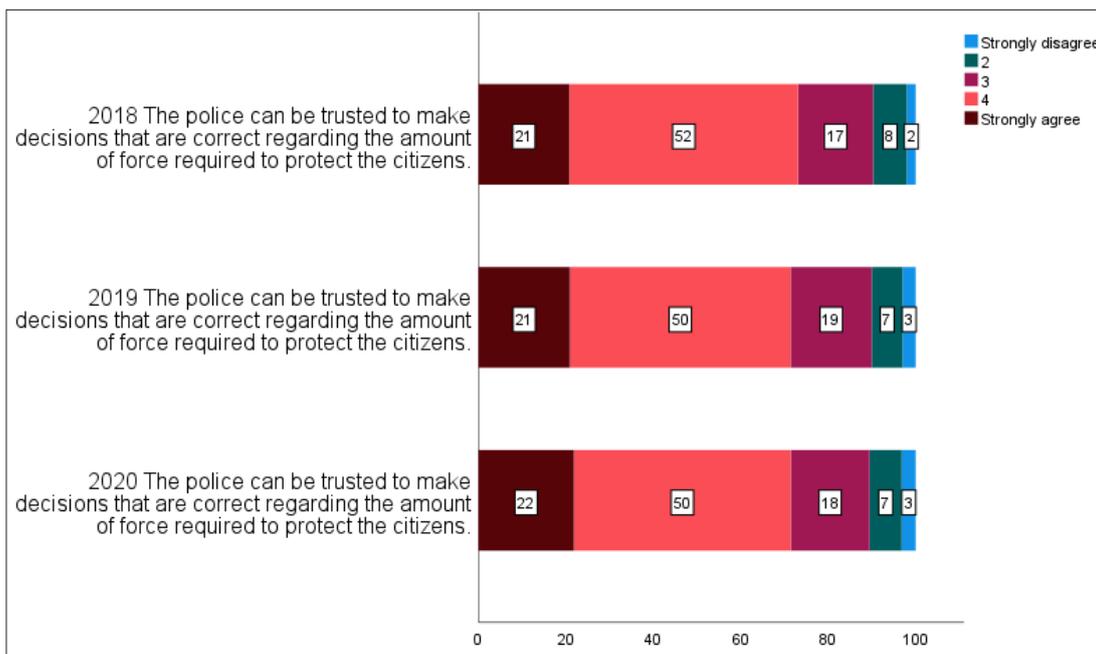


Figure 17. General question about amount of force from three timepoints in percentage.

Charts of the distribution of citizens’ opinions of police in more specific areas.

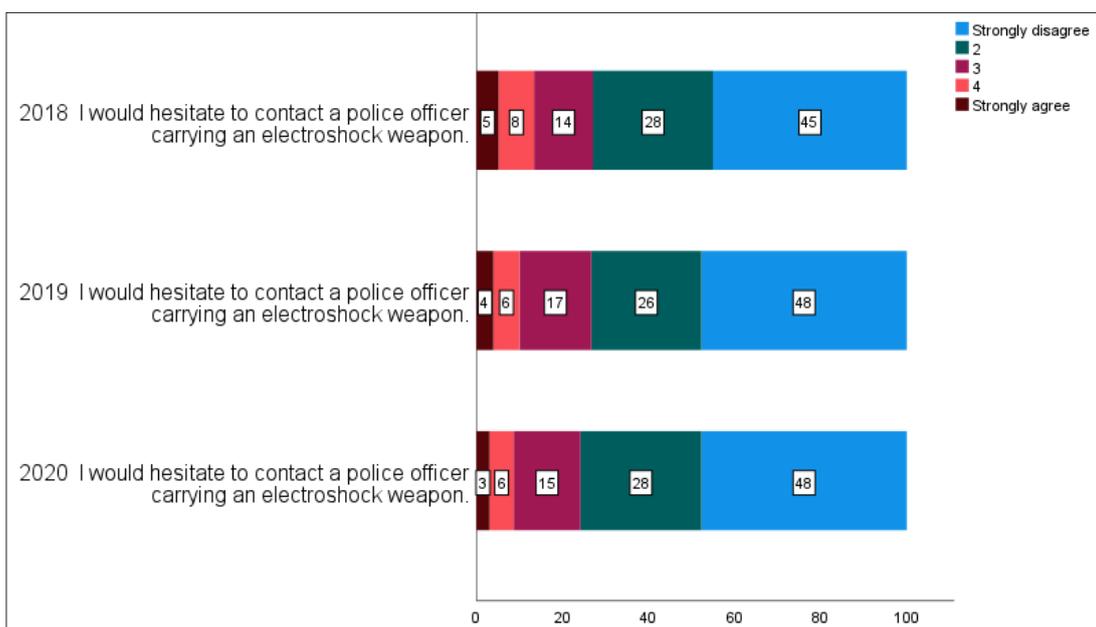


Figure 18. Specific question about contact from three timepoints in percentage.

A small group agrees with the statement indicated by choosing the alternatives 4 and 5. When investigating group differences based on gender, there is significant difference where females are slightly overrepresented among those choosing alternatives 4 and 5, but the practical difference is not of any relevance according to Cramér’s V value of 0.07, which indicates no meaningful association.

RESULTS

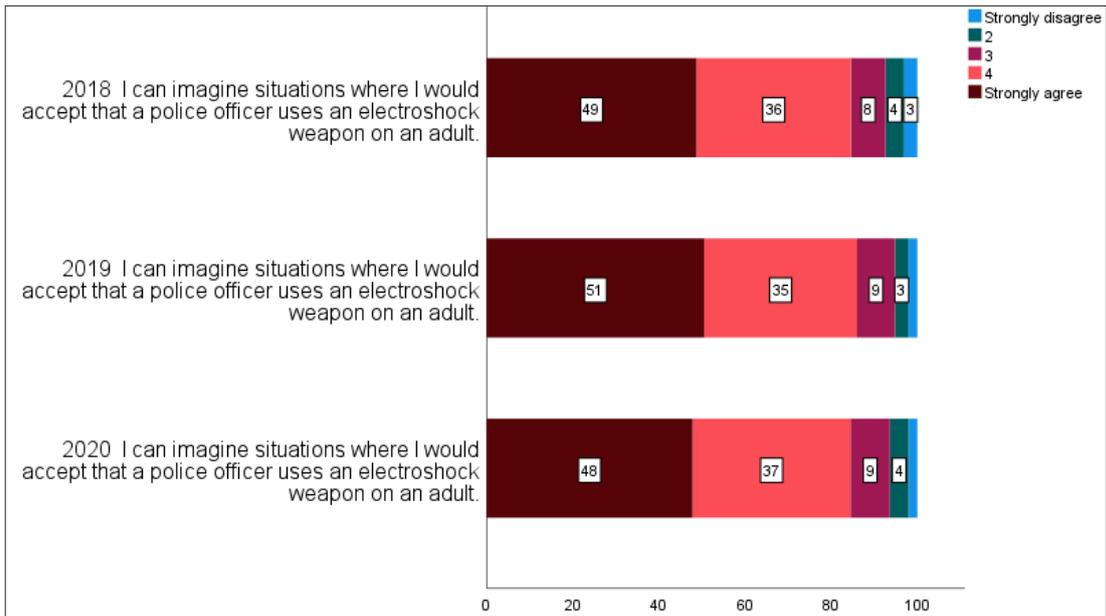


Figure 19. Specific question about the use of CEW from three timepoints in percentage.

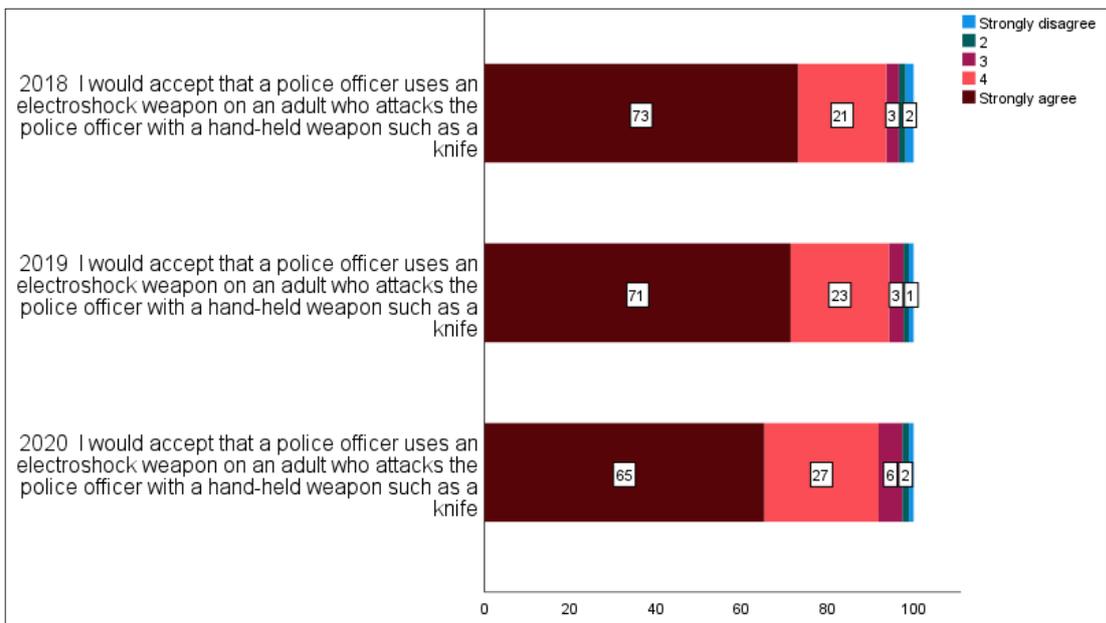


Figure 20. Specific question about the use of CEW from three timepoints in percentage.

In 2019, we included an item about whether the respondents had received information on cases with CEWs to analyse it; this item was also used in 2020. In 2019, the 504 had answered ‘yes’, and 421 had answered ‘no’, while in 2020, 419 had answered affirmatively, and 610 negatively. The two following figures compare the answers from the ‘yes’ group with those from the ‘no’ group.

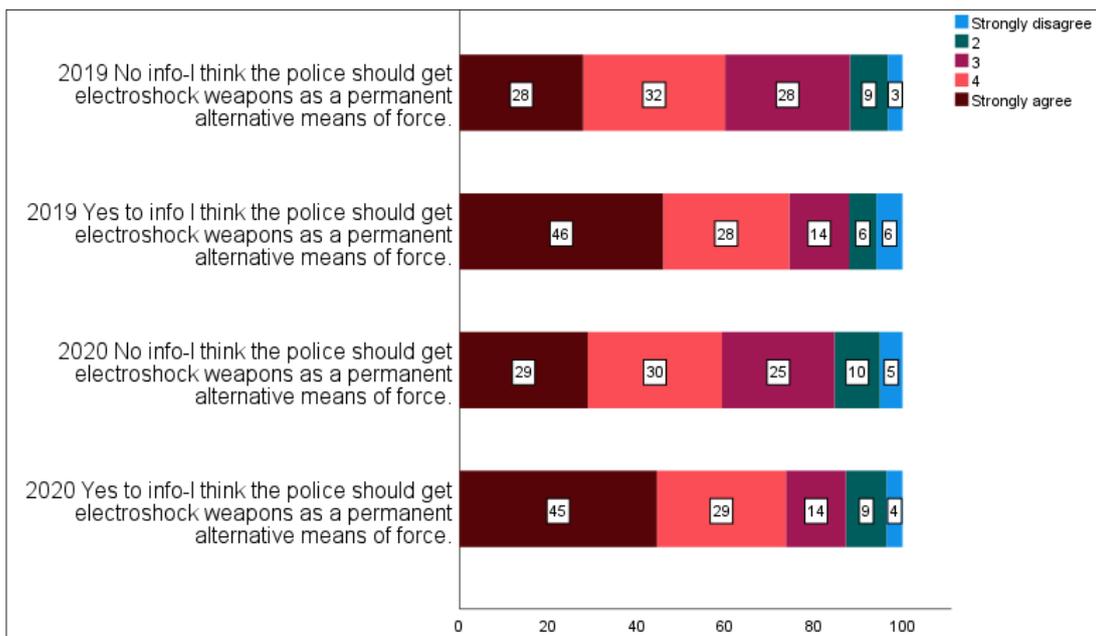


Figure 21. Specific question about CEW from three timepoints in percentage.

The ‘yes’ group was more positive and agreed with the item in both years. The difference is significant and meaningful to a certain level, with the Cramér’s V value of 0.23 indicating a low association. We then analysed those who had information and had chosen the alternatives indicating some form of disagreement (1 and 2); females are slightly overrepresented in this group, and there was a significant difference indicated by a Cramér’s V value of 0.16, which indicates a low association.

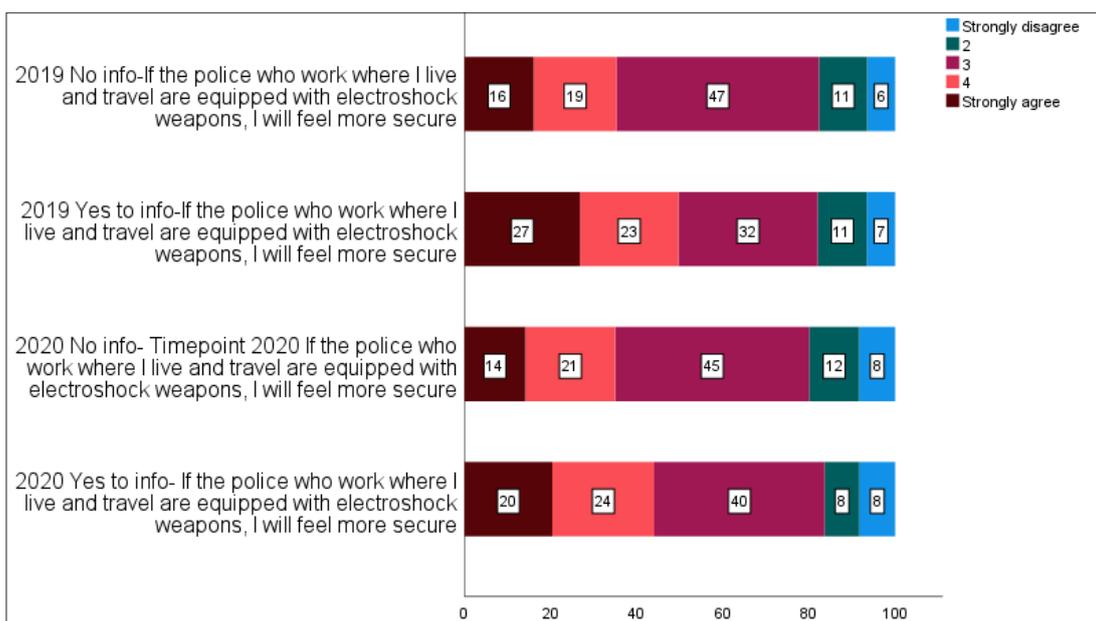


Figure 22. Specific question about CEW from three timepoints in percentage.

The ‘yes’ group is more positive and agrees with the statement about feeling more secure in both years. The difference is significant and meaningful to a certain level, with the Cramér’s V value of 0.14 indicating a low association. In the ‘yes’ group, there is a decline from 50% choosing alternatives 4 and 5 in 2019 to 44% choosing the same alternatives in 2020. Among those having information but not agreeing, we found no gender-based difference.

RESULTS

POLICE RECORDS OF DOCUMENTED USE OF CEWS

These data are rich in information regarding the variables of interest in each situation where CEWs have been used. Some variables contain information from most cases, and others have missing information in several cases. To provide an overview of the material, some of the variables are presented. The data were divided in three sets: threat of use, use, and drive stun mode. There were only four cases involving drive stun, which were therefore not presented.

Threat of use had most observations, as shown in the tables below.

Table 14. Threat of use per station, 2019-2020.

		Year	
		2019	2020
		Count	Count
Station	BT	0	1
	Finnsnes	3	1
	Follo	8	6
	FOT/Haugesund	2	1
	Fredrikstad	10	5
	Romerike	1	0
	Sauda, Suldal, Etne, Vindafjord	1	1
	Stavanger/Ryfylke	14	15
	Stord	1	1
	Tromsø	6	5
	Ullensaker	6	3

Table 15. Threat of use presented within several variables, 2019-2020.

		Year	
		2019	2020
		Count	Count
Gender	Female	6	4
	Male	46	35
IP-level	1	0	1
	2	1	0
	3	26	16
	4	25	22
Initiated mission	Operation central	38	29
	Patrol	14	10
Leader of the mission	Another	36	25
	Oneself	16	14
Effect with CEW	Other	1	0
	Some effect	2	2
	Good effect	31	29
	Not relevant	0	1
	No answer	0	1
	No effect	1	1

Table 16. Threat of use presented with variables providing information on counterpart, 2019-2020.

		Year	
		2019	2020
		Count	Count
Gender (cp)	Female	5	5
	Male	47	34
Known to the police (cp)	Yes	47	35
	No	5	4
Body physics (cp)	Other	2	1
	Big and strong	16	12
	Small and thin	7	7
	Small and strong	2	4
Psych stat (cp)	Normal	25	15
	No suspicion mental illness (mi)	7	5
	Known_documented_(mi)	14	9
	Suspicion of (mi)	11	9
	Unknown_difficult to evaluate	17	16
Actions of (cp)	Escape from police/avoidance of arrest	20	20
	Violent towards others	7	6
	Violent towards police	11	7
	Violent towards oneself	7	3

Note. cp = counterpart, indicating the person exposed to CEWs; mi = mental illness.

Use of CEWs:

Table 17. Use of CEWs per station, 2019-2020.

		Year	
		2019	2020
Station		Count	Count
BT		6	2
Finnsnes		0	2
Follo		2	1
FOT/Haugesund		1	2
Fredrikstad		5	4
Sarpsborg		0	1
Stavanger/Ryfylke		11	15
Stord		1	4
Tromsø		4	5
Ullensaker		4	3

Table 18. Use presented within several variables, 2019-2020.

		Year	
		2019	2020
		Count	Count
Gender	Female	0	3
	Male	34	36
IP-level	1	6	2
	3	14	22
	4	14	15
Initiated mission	Operation central	28	31
	Patrol	6	8
Leader of the mission	Another	24	30
	Oneself	9	9
Effect with CEW	Other	0	0
	Some effect	6	7
	Good effect	23	27
	Not relevant	0	0
	No answer	0	0
	No effect	5	5

Table 19. Use presented with variables providing information on counterpart, 2019-2020.

		Year	
		2019	2020
		Count	Count
Gender (cp)	Female	2	4
	Male	32	35
Known to the police (cp)	Yes	34	39
Body physics (cp)	Other	2	2
	Big and strong	9	7
	Small and thin	2	4
	Small and strong	1	5
	Normal	19	21
Psych stat (cp)	No suspicion mental illness (mi)	3	4
	Known_documented_(mi)	13	16
	Suspicion of (mi)	11	8
	Unknown_difficult to evaluate	7	11
Actions of (cp)	Escape from police/avoidance of arrest	18	12
	Violent towards others	2	4
	Violent towards police	9	18
	Violent towards oneself	5	5

Note. cp = counterpart, indicating the person exposed to CEWs; mi = mental illness.

RESULTS OF INTERVIEWS WITH POLICE OFFICERS

To what extent are CEWs used and in what situations?

The informants described CEWs as primarily used against physically large persons as well as persons who threaten the police with weapons and/or are aggressive. They also described CEWs as being used in situations with suicidal persons who, for example, threaten to cut themselves with a knife. Further, they described CEWs as mainly used against individuals who are mentally unstable, aggressive, and dangerous through their behaviour. There were reports of CEWs being used against people with full mental capacity in hazardous situations where threatening to use CEWs was enough to get them to comply with the police. A common view amongst interviewees was that CEWs are useful in hazardous situations that do not involve firearms and that CEWs are used to cover up for the firearms in the encounter with stabbing weapons and hand-held assault weapons.

The police's use of other forcible means and the total use of force

The majority of informants agreed that it is clear when to use CEWs. Most of them claimed that it would be better if the CEWs were on the same level of the continuum of force as pepper spray and batons. One informant, who was a CEW instructor, reported that the officers have difficulties dealing with another means of power during training, and this results in them taking longer to act. However, one informant suggested that CEWs provide additional solution alternatives with better outcomes for already difficult situations. Information regarding the situation and previous experience is important in assessing which means of power is appropriate. For example, previous incidents with the person in question are important to determine what means of force to choose.

In all cases, the informants reported that CEWs fill the gap between pepper spray or batons and firearms and that they complement other forcible means such as arrest techniques, pepper spray, batons, dogs, and firearms. Some suggested that CEWs are used instead of pepper spray or batons, but that these can also be used as complements to firearms in various threatening situations. Everyone said that CEWs are good complements to pepper spray and baton but do not replace firearms. This view was reflected by another informant who stated that a 'CEW is a complement to other forcible means, but firearms must always be available when stabbing weapons are involved' (Informant 9).

Another informant said,

CEW fills the gap between pepper spray / baton and firearms, but I also believe that even if pepper spray / baton may be used in dangerous situations, many police officers wait to use force until it reaches the same level as CEW, i.e. serious risk of personal injury or to one's life. This results in CEW being a better alternative. (Informant 4)

Most of the informants wanted to keep other means of power (in the police's toolbox) because different tools/ weapons meet different needs. Some of them described situations when both pepper spray and batons may be more suitable than CEWs – for example, because of the distance to the counterpart. Several informants said that they would rather choose a baton when intervening against crowds; however, a CEW gives them an additional means of power that provides greater opportunities to be flexible in their mission and thus cause the least possible damage. All informants agreed that different means of power can complement each other in the event of an intervention. Only a small number of informants reported that CEWs replace other means of power. Most of the informants explicitly relate to paragraph 6 in the Police Act¹ (Politiloven) when they talked about the use of forcible means. The informants expressed that the police should use the least possible force and that CEW gives them the possibility to do so.

There were some negative comments about where CEWs are placed on the continuum of force compared to other means of force. Informants mentioned that they did not agree on CEWs being placed above pepper spray and batons. One informant was hesitant with regard to the latter and thought that CEWs are less intrusive because they cause less harm in comparison; however, CEWs are still above them on the continuum of force. Another informant expressed that CEWs should be on the same level as pepper spray and batons, and some of the informants said that pepper spray do not work well.

An expressed positive aspect regarding CEWs was that they work better than pepper spray because they are more humane and have a better effect. Further, they look dangerous but are not, and they only cause five seconds of pain compared to pepper spray, which can cause pain lasting for several hours. Another informant reported that CEWs work equally well for all users and are not affected by physical capacity, compared to – for example – the use of batons.

¹ The police shall not use stronger means without weaker means being assumed to be insufficient or inappropriate or without such having been tried unsuccessfully. The means used must be necessary and in proportion to the seriousness of the situation, the purpose of the service action and the general circumstances.

Informants reported that the implementation of CEWs did not affect the total use of force. One interviewee argued that they still get a decision on firearms from the police command centre, but before the trial, there were concerns that they would not. Another interviewee reported lower use of pepper spray and physical methods but also that the police officers do not refrain from using physical methods if these are sufficient and safe. One police officer reported that CEWs do not affect the total use of force but that they may create a risky situation. Therefore, he emphasised the importance of proper monitoring so that there is no development in which police officers take greater risks – both for themselves and the counterpart.

The police officers' ability to perform their duties

Some felt that CEWs do not affect the ability to solve tasks, while others considered that CEWs provide the opportunity to resolve emergency situations that arise when the police do not carry firearms. The police can, at least, freeze and secure the situation with CEWs while waiting for armament. The informants demonstrated that CEWs provide the opportunity to resolve shooting situations without firing firearms, even when the police are armed; thus, fatal force can be avoided if it is possible to resolve the situation with CEWs, i.e. less intrusive force with less risk of injury. One example that was mentioned is that the police can handle static situations with a knife in a better way, i.e. the police can shoot with CEWs even if the person does not attack, which means that they can take control using the least possible force instead of waiting and risking an attack that leads to the use of firearms and the risk of fatal injuries. Another informant stated that it is just as important to be mentally prepared together with colleagues before the situation as to be able to use CEWs.

When asked about whether the CEWs cover a previously unmet need, the informants said that CEWs fill a clear gap – when pepper spray or batons are not enough, and a firearm is an excessive intervention. One informant was not sure whether CEWs cover an unmet need, but with them, when the limitations of the situation are considered, interventions are safer. In all cases, the informants reported that CEWs fill the gap between pepper spray or batons and weapons and result in safer interventions where no one is harmed.

The police officers' perceptions of safety and security

Most of the informants experienced safety with CEWs as a means of power. They felt that they can make safer interventions and intervene without having to use firearms. Some of the informants said that they felt safe before the introduction of CEWs and hence do not feel any safer with them. Another informant described the idea of keep-

ing a distance as a key to feeling safe and to making safer interventions. One example is a police officer who felt safer in a situation with CEWs because he might have had to run back to the car to retrieve firearms otherwise, meaning that he would have lost control of the counterpart. The informant felt generally safer with an alternative that would allow him to act quickly without using lethal force in emerging dangerous situations, which creates more everyday security for police officers. The informant mentioned that police officers feel safer having CEWs as an alternative to other means of power.

One of the informants said that some may be afraid of using CEWs because they risk being criticised afterwards. Another informant claimed that CEWs may provide a false sense of safety related to the fact that the intended effect is not always achieved. While a minority mentioned that technical faults shown on the display create uncertainty as to whether it will work or not, all agreed that they feel safe with CEWs. In general, the informants were aware of the limitations but did not feel insecure; instead, they reported that CEWs give them security and safety.

Injuries and lethal force

When asked about injuries, the participants were unanimous in the view that CEWs are clear complements to pepper spray and batons with less risk of harm to the counterpart and that there is little risk of injury if risks with high altitude or near water as well as with persons mentioned as risk persons in the instructions are taken into account. One of the officers had experienced three scenarios that could have ended with the police shooting, injuring, or killing the counterpart. Further, this officer stated that CEWs had protected police officers in rapidly changing situations when they had not been equipped with firearms. With regard to injuries, one of the police officers expressed the view that CEWs cause minimal harm in situations that could have ended with fatal injuries for both the police and the counterpart; further, they had experienced situations where CEWs were not available that could have been solved more easily and in a faster and safer way with CEWs. CEWs provide faster control of the counterpart, and those directly affected recover quickly. One informant argued that CEWs de-escalate situations both preventively and when used, and they have a very good effect with no harm/damage. As one interviewee put it, 'CEW saves lives' (Informant 8). Although the informants perceived that CEWs save lives, one of the informants described a situation in which the CEWs did not have the intended effect, and the police had to use lethal force in a situation of fatal danger.

Some negative remarks were made about the instructions regarding CEWs, which they suggested should be revised so that CEWs could be used proactively in more static situations, instead of in a reactive way when an attack

occurs. When these are used reactively, the situation becomes dynamic and thus more difficult. In a dynamic situation, it is more difficult to hit the counterpart with CEWs, and this increases the risk of injuries.

The effectiveness of CEWs

Most participants agreed with the statement that CEWs are effective when attempting to control someone. All informants agreed that CEWs are effective with a perfect hit, that is, when the arrows attach to the body or clothes at a sufficient distance from each other. However, in other situations, the effect is not achieved due to the arrows not attaching to the body because the counterpart is moving, or a closed circuit is not achieved because of thick clothes. One informant reported experiencing a perfect hit, but one arrow hit a mobile phone in the pocket, which caused the CEWs to have no effect and the person to wave off the cable. Some suggested that a thick jacket makes the split belt² not work. One informant suggested to aim horizontally instead, with both dots on the legs. Another problem occurs when the distance between the officer and the target person is too short, which causes the arrows to be too close to each other, although the arrows are attached to the body; a solution is to shoot two cassettes – one hit (two arrows) in the upper body and one hit (two arrows) in the lower body for increased space between the arrows; this approach increases the chance of the intended effect. One informant argued that not the electrical current but the sound from the CEW could have an effect on the counterpart. Some informants had experienced situations where they handled matters with CEWs but without firing the cassettes.

One informant said that,

The effect is important to reflect upon, and if you assume that it works perfectly every time, you need to think about many variables to consider. There are very many sources of error that can cause no effect. Distance is one thing as well as how the arrows attach and the distance between them. It is very sensitive matter to have the right distance to the counterpart. Clothes can be enough to hinder the effect, and a counterpart in motion can be hard to hit with two aims and the wires can come off. The CEW is susceptible to not work. (Informant 9)

Tactical challenges and advantages with CEWs

Several of the informants claimed that it is important to handle the limitations of the CEWs (for example, that thick clothes or too close of a distance result in no effect) with training in tactics. Most of the informants mentioned that the range for using CEWs (7.60 metres) is within the safety distance, which is 10 metres in the event of a knife threat or knife attack. One of the officers said that the police must know how to move forward and be offensive

to get within the 7.60-metre distance and that the element of surprise is important in order to hit the target. The limitation to use CEWs at a distance of at least two metres from the target means that the police need to back away when, for example, they are intervening against drivers in a car. If they shoot within two metres, the distance between the arrows will be too close, which means that there is a risk that the CEW will not be effective. Some informants claimed that they need more practical training in handling these weapons because they are complicated to use compared to a pistol. Officers need to consider factors such as distance and thick clothes differently than when using firearms. The informants also said that it is difficult to see the dots in the daylight; one of them mentioned that a police officer had lost their CEW to a counterpart, but this issue had been resolved with a better and safer holster.

One of the informants stated that it is important to discuss the limitation of CEWs not having the intended effect during training and tactical reviews. The basic tactic has a clear main rule of making the counterpart approach the police. The same informant claimed that CEWs are complementary weapons and that tactics and mental preparation are the most important elements, and they recalled a tactical challenge, namely that it is difficult to estimate distance and time; thus, it is important to plan the intervention with the patrol colleague.

When asked about tactical advantages, the informants all agreed that they can act in situations with different means of force and use the most appropriate method depending on the situation; further, they can act at a greater distance compared to when pepper spray and physical methods are used. However, one informant suggested that CEWs provide the opportunity to switch between non-confrontational/defensive tactics to be offensive, to change tempo to get within shooting distance and take control and to be able to shift back out if the intended effect is not achieved – in other words, to move from confrontational to non-confrontational tactics depending on the situation.

The most significant tactical advantage that the informants talked about was that they can act in situations that are below the level of using firearms but above the level of pepper spray and batons; thus, they can avoid shooting or avoid using pepper spray or batons. The informants suggested that CEWs cause less damage and less risk of injuries than firearm, pepper spray, and batons, while providing the intended effect. One informant suggested that CEWs contribute to fewer physical fights, being able to avert violations in situations that may escalate, and that they make it possible to anticipate and deal with violence towards the officers.

² One arrow above the belt (in the upper body) and one arrow below (lower body).

The informants did not experience any significant problems but stated that it can be problematic to sit in the patrol car with both CEWs and firearms in the belt. This problem depended on the car model. CEWs can be usually carried with ease, but some suggested that this could be further improved with an equipment vest or a possibility to click off the CEW holster.

Demographic differences

Regarding CEWs and differences in gender and age, some of the informants suggested that officers who are physically smaller or have a lower ability in arrest techniques have a greater advantage in having access to CEWs, which allows them to participate in situations they would not otherwise control. Regardless of this, the informants claimed that every police officer should be trained in CEWs.

When asked about whom CEWs can be used against, the informants claimed that they work regardless of the person and that 'it is the situation that decides'. The informants had no experience of using CEWs against any special groups but experienced situations in which individuals with mental illnesses were often exposed to CEWs.

The police officers' approach towards the citizens

In all cases, the informants reported that CEWs give them an alternative to other means of power without changing their approach towards the citizens. In their accounts of the events surrounding CEWs, the informants referred to paragraph 6 in the Police Act³ (Politiloven).

In general, the informants have not witnessed any negative opinions about CEWs from the citizens, nor have they perceived changed attitudes towards the police. Instead, they have perceived positive attitudes among the public towards CEWs. Several of them said that, although they have not noticed a difference in attitudes from the public, people are curious and ask questions about CEWs. One informant stated that the public seem to think that it is time for the police to get CEWs.

RESULTS OF INTERVIEWS WITH CITIZENS AND REPRESENTATIVES OF DIRECTLY AFFECTED PERSONS

Citizens' general perceptions of and confidence in the police

The introduction of CEWs is not experienced as something that will considerably change citizens' perceptions of the police. It is mentioned that most citizens never come into contact with the police and therefore have no strong opinions; they are neither for nor against the introduction of CEWs. Citizens reasoned that if one has a high level of trust in the police, one probably has confi-

dence that the police will use CEWs and other means of force in an appropriate way. The informants expressed that CEWs seem to be humane weapons that are not dangerous and trusted that there is a good reason for the police to have them. Most people do not like firearms; thus, the informants believe that if people knew that the police had non-lethal means of force, most of them would be comfortable with it.

The informants believed that CEWs would not affect the contact between the police and the general public. However, if the police used them when they should not, the situation could change. Misuse could get media attention and intensify antagonisms between police and certain groups of citizens. However, there have been no incidents where the public felt that it was wrong to use CEWs. If one, as a citizen, sees that CEWs work, it could make people feel safer; if these are used in the wrong way or too often, it can make people feel less safe. If the use is perceived as unnecessary, it can create greater mistrust among those who are exposed to CEWs. On the other hand, some citizens do not have much confidence in the police and thus seem to be against all means of force. It is also emphasised that the police should work harder to try to increase trust in the police, build relationships and work preventively:

I do not think that CEW affects trust, but the most important thing is that they can trust the police to use weapons in moderation. And then I reckon, hope, and believe, that they have received training on when and how. (Informant 5)

Citizens' perceptions on the police's general use of force

Citizens stated that there is a generally high level of public confidence in the Norwegian police and in the profession itself. They described that they had no problem contacting and talking to police on the street. When it comes to the use of force and police tools, citizens felt that they had confidence in the police and that the police knew which alternative was the most appropriate in various situations. An informant said that neither excessive violence by police nor violence towards the police occur often in Norway.

Representatives of interest groups said that the issue of CEWs can be discussed as part of something larger (e.g. what kind of society one wants to live in and the role of the police in that society). A disadvantage of an increased armament in the form of CEWs is the symbolism that it could illustrate, that is, a form of militarisation of the Norwegian police. At the same time, it is mentioned that society has changed – and thus also the role of the police.

³ The police shall not use stronger means without weaker means being assumed to be insufficient or inappropriate or without such having been tried unsuccessfully. The means used must be necessary and in proportion to the seriousness of the situation, the purpose of the service action and the general circumstances.

It is described that it used to be beneficial to have unarmed police, but nowadays, weapons are more easily accessible to criminals, and the state of criminality has changed; therefore, the Norwegian police must be aligned with that development. Further, one representative of an interest group describes a polarisation in the role of the police in Norway and argues that there is an ongoing political discussion about this matter. Some may, therefore, experience the increased power of the police as something negative.

Citizens' perceptions on the police use of CEW

The informants described various aspects regarding the police use of CEWs, such as overall benefits, police carrying CEWs, CEW use in different situations, and issues related to vulnerable populations and those directly affected.

Experienced benefits of CEWs

The informants described the perceived benefits of CEWs. One major advantage was the police being able to reduce the risk of injuries for police officers, citizens, and counterparts through the use of CEWs rather than other means of force. Furthermore, they described that CEWs enable the police to gain control and resolve situations more quickly, which is better for everyone involved in the situation – especially the victims. A CEW is also mentioned as a more humane tool than, for example, the baton.

Another benefit was that CEWs can contribute to an increased sense of safety for the police and the public. They could increase safety for police officers working in environments with a high level of crime, and having access to CEWs can reduce their stress levels and give them opportunities to communicate more adequately; moreover, police officers would not have to go near or partake in dangerous situations:

It must feel special to enter an environment without being able to defend oneself with anything other than one's fists. I think that CEW would make the police safer and that they would then be calmer, because they do not have to be on full alert. (Informant 3)

CEWs are perceived as an alternative to firearms; this means that the use of firearms could decrease, which would contribute to increased safety for police officers and others involved in situations. Moreover, informants expressed that their sense of safety increased to some extent when the police were armed for a while after the terrorist attacks in Oslo and Utöya in 2011 because the police could do more than 'simply talking'. However, there was also an ambivalence among informants about whether the introduction of CEWs in the police force was necessary:

I think that CEW is better than an ordinary weapon, but at the same time it is a weapon. They may not have it all the time. But at the same time, it is not as deadly as ordinary weapons (firearms). So, on the one hand – is it necessary? Maybe not. On the other hand – it is better than firearms, if that is the alternative. (Informant 6)

Experiences regarding police carrying CEWs

The respondents held different opinions regarding whether police officers should carry CEWs on their belts or have them in their cars. Some felt that it did not matter as they trusted that the police would be able to do their job regardless. The informants described that carrying CEWs could be a form of injury prevention as these are visible and signal that the police could intervene directly if needed; others considered it unnecessary for the police to carry CEWs with them and instead wanted the weapons to remain in their cars. There was a concern that police officers would be able to use CEWs at any time, and many believed that the police should be given the go-ahead before using these weapons. This aspect was connected to Norwegian citizens appreciating having a police force that do not carry weapons (e.g. firearms), which was defined as something that made them feel safe as citizens. CEWs are described as weapons, and many wished for the police to use them as seldom as possible.

Another topic was the unfamiliarity of seeing armed police in the streets. Carrying CEWs could be seen as a kind of escalation of police violence by some and could therefore be considered something negative. It was mentioned that the public in Norway has confidence in the police in part because they are not armed; thus, increased armament could be interpreted as a form of 'militarisation'. Comparisons were made with images of armed police in other countries – an experience described by citizens as scary, unpleasant, and something that made them feel unsafe, as they were simply not used to seeing heavily armed police. Informant 5 said, 'When the police walk around the streets, I do not want to see guns. But we do not see the police that often. They do not walk around in the streets'.

Police use of CEWs in different situations

Overall, citizens believed that the threshold for firing with CEWs should be high and that it should be in situations 'that really matter'. They described different scenarios in which they believed it was suitable for the police to use CEWs and where that type of violence is considered legitimate – when someone poses a danger to the police and others by threatening them or when there is risk of serious injuries or a danger to one's own or others' lives. For example, it was considered appropriate to use CEWs in a situation where the counterpart has used severe violence against someone else.

However, perceptions regarding when it is legitimate of the police to use CEWs differed. Some argued that CEWs could be used when people try to escape from the police (theft, drunk driving, and robbery), while others believed that they should not be used when someone is fleeing/running away, even if that person has committed a crime. In addition, they should not be used if the police do not need to arrest anyone, when the counterpart is distant, or when they do not pose a danger to others; in these cases, the police should wait. Informant 2 said, ‘The intention must be to prevent injuries and save lives. Using force to protect is therefore more ok than other violence’.

Citizens felt that it was not necessary or legitimate for the police to use CEWs in the following scenarios: against minors, in situations with minor criminal acts, in demonstrations, when a crime is only suspected, and when situations can be resolved in other ways. If the police used CEWs in situations where these are not considered necessary by the public, it could lead to a lower level of trust in the police. With this regard, Informant 4 said, ‘I have great confidence in that the police take the use of weapons seriously, but perhaps there is a danger that the threshold for when to use [a] CEW will be lower?’

Directly affected persons and vulnerable populations

Representatives of vulnerable populations or those who could be exposed to CEWs highlighted several different aspects in relation to this aspect. They considered that both carrying and using CEWs could have a preventive and deterrent effect on those directly affected given they are aware of the pain caused by CEWs. For the public, this may mean greater safety and security, but for those directly affected, it means a lower threshold for violence. One concern raised was that police officers might start using CEWs too readily, and CEWs would then be used to resolve situations more quickly.

Since the police often need to use violence against individuals with mental illnesses, it is important for the police to have knowledge regarding that group. Some argued that the threshold for using CEWs against such individuals should be high and that police should try to avoid doing so. The informants reasoned about when it would be legitimate to use CEWs against them, and it was suggested that if a person with a mental illness threatens others, then there must be greater consideration for the potential victims, and CEWs can be used. It was also considered okay to use force to prevent someone from taking their own life. The informants mentioned that, although there is an ongoing debate about this matter, one of the tasks of the police is to protect lives, which justifies the use of CEWs in suicide attempts.

People experiencing psychosis are often very worn out, and an advantage that was brought forward was that a weapon such as a CEW could prevent them from experiencing injuries. With the help of CEWs, the police can quickly end a situation that involves, for example, an irrational person. The feelings of safety among police officers were also considered beneficial for the vulnerable populations and those directly affected as a safer police force can provide calmer intervention.

Some argued that the police sometimes use excessive force – especially in the field of intoxication. The directly affected are described as people who want the least possible contact or conflict with the police and do not contact the police. One highlighted aspect was that the fear of those directly affected – and especially of vulnerable persons – may increase and that they will try to stay away from the police. On the other hand, the informants considered CEWs to be so new that those directly affected do not really consider them at this time. Whether CEWs are worn on a belt or not, they are not perceived as something that affects the fears/perceptions among counterparts/criminals. Nevertheless, some people may try to find a way to protect themselves from CEWs.

It was also mentioned that pepper spray would be more humane to be exposed to in comparison with CEWs, as one would still be standing. Losing control of one’s own body could feel more intrusive and be experienced as a violation of one’s integrity. Another perception was that the pain caused by CEWs can be a traumatic memory that the person in question will carry with them. The issue was also raised to a higher level: the police who wilfully cause pain represent the state, which in turn should protect those in need of help. Informant 1 said, ‘Personally, I would not notice anything, but for vulnerable groups it will make a difference’.

Discussion

The purpose of current study was to evaluate the National Police Directorate's CEW trial and to explore the public's perceptions of the police's use of CEWs. With regard to the effects of such use, we primarily focused on the possible changes in perceptions and experiences of threats, violence, and injuries as well as the ability of police officers to perform their duties and the police's use of other means of force. We also investigated whether, and if so how, CEW use affects the police's self-assessed stress, safety and security, perspective taking, and contact with the public. Furthermore, we investigated the tactical challenges and advantages of using CEWs and any potential gender-based differences in their use. Finally, we examined public perceptions of CEWs. In this concluding chapter, we summarise the main results and discuss these in relation to previous research on the use of CEWs.

'Who the citizen is' and 'what the citizen does'

The first question in this study sought to determine to what extent and in what situations CEWs are used. The total number of CEW uses (threatening to use and use) was 168 during the trial period 2019-2020, which can be compared to the Finnish police, with 250-350 uses per year (Rikander, 2016), and the Swedish police, with 626 uses during the two-year trial period 2018-2019 (The Swedish Police Authority, 2020). The current study found that CEWs are mainly used against individuals who are mentally unstable and exhibit aggressive and dangerous behaviour. This finding is consistent with that of Adams and Jennison (2007), who stated that CEWs often are used to confront individuals with mental illnesses as well as individuals who are under the influence of alcohol and/or drugs and become aggressive. Another study in the USA found that individuals with a mental illness and/or under the influence of drugs were at greater risk of being subject to multiple CEW shocks than those without a mental illness or not under the influence of drugs (Bailey, Smock, Melendez, & El-Mallakh, 2016). Findings from the police records showed that the Norwegian police rarely use drive stuns, although the findings from the interviews revealed that the officers at times fire two cassettes to better ensure a closed circuit for the intended effect and that CEWs are primarily used against physically large persons as well as persons who threaten the police with weapons and/or are aggressive. These findings are not supported by the police records, which showed that the counterpart was 'big and strong' in 22% of situations where the police used CEWs and in 31% of the situations where the police threatened the counterparts with CEWs, but the majority of the counterparts had a normal body physics. In addition, the police records showed that escaping from the police or avoiding an arrest was the reason that prompted threatening to use (44%) and using (41%) CEWs. However, these findings ought to be inter-

preted with caution due to subjective judgement and to not having combined different variables. These results further support Dymond's (2018) idea that both 'who the citizen is' and/or 'what the citizen does' affect the use of CEWs. Adams and Jennison (2007) proposed that the contextual nature and impact of CEW deployment makes it difficult to draw any general conclusions, suggesting obtaining feedback after each situation so that current guidelines are updated based on new experiences. The interviews suggested the importance of monitoring the use of CEWs to avoid making police officers take greater risks, both for themselves and the counterpart. Dymond (2020) argued that technology can influence discretionary decisions and that CEWs may well make police officers safer but also heighten the officer's confidence, and this may put officers at greater risk.

Forcible means and total use of force

The second question in this study investigated the effect of CEWs on other forcible measures and the overall use of force by police officers. The findings from the survey showed that the study group (those equipped with CEWs) used CEWs to a greater extent than pepper spray in both 2019 and 2020. These results are consistent with data obtained in the interviews, where the informants reported that CEWs fill the gap between pepper spray or batons and firearms and that they complement other forcible means, such as arrest techniques, pepper spray, batons, dogs, and firearms. This finding is consistent with that of Ander et al., (2020), who found that the introduction of CEWs decreased the use of pepper spray and batons.

The findings from the survey using the UFC instrument, including hypothetical scenarios, showed that CEWs replaced batons and peppers sprays to some extent in middle and high-level violence situations, but both the study and control groups used physical methods in low level violence situations. The most distinct difference was seen in high-level violence situations, where the control group would use pepper spray or guns, and study group would use CEWs. The study group reported that they had the right equipment to a higher extent than the control group, and findings from the interviews showed that CEWs are good complements to pepper spray and batons, but they do not replace firearms. Further, the results from the interviews indicated situations where it is possible to use CEWs instead of firearms, although 'firearms must be available when stabbing weapon are involved'. These results echo a recent study in Sweden, suggesting that CEWs complement other forcible means (Ander, et al., 2020), and a US study by Adams and Jennison (2007), indicating that they can replace the use of firearms under certain circumstances.

'Just another tool in the toolbox'

The possibility to use a CEW as another tool in risky situations is related to the third question in this study, namely the police officers' ability to perform their duties. The findings from the interviews showed that the officers could resolve the situations before the introduction of CEWs, but with CEWs they can do so with less intrusive force and with lower risk of injury. A Swedish study indicated that CEWs have been used instead of firearms in several situations, but the authors claimed that more evidence is needed to conclude that CEWs reduce the use of firearms (Ander et al., 2020). A note of caution is due here since the results from the Swedish study are based on interviews and a survey, and those of this study are based on interviews and are thus subjective experiences.

Police officers' perceptions of safety and security

Regarding the fourth question, which was concerned with the police officers' perceptions of safety and security, the findings from the interviews showed that the officers felt safer mostly because of CEWs give them the opportunity to intervene without discharging their firearm. This finding reflects those of Ander et al., (2020), who also found that Swedish police officers felt safer knowing that they have an alternative to using fatal force. Another important finding was that the respondents cited paragraph 6 in the Police Act (Politiloven) to recall that that the police should use the least possible force and that CEWs enable them to resolve situations with less violence. This is also in line with findings from the Swedish study by Ander et al., (2020). The findings from the survey showed that the study group felt safer than the control group when using handcuffs, arrest techniques, and verbal force (orders and warnings). A possible explanation for this may be that having CEWs could help in those situations; thus, the police officers feel safer if they can combine CEWs with other forcible means.

We used a stress measurement instrument (PSIQ) in an attempt to measure safety and security. The findings from the survey showed very few differences between the study group and the control group that can be related to the trial of CEWs; however, the study group perceived a decrease in stress in relation to 'Police intervention against crowd', while the control group perceived an increase. We detected the same pattern in the control group regarding stress in relation to 'Injured by chemical substance', while the study group showed no change over time. The differences regarding 'Police intervention against crowd' seem to contradict the findings from the interviews, where the informants said that they would rather use batons when intervening against crowds. However, the findings from the survey are in line with the results from the Swedish study, which reported that police officers equipped with CEWs could more easily control threatening situations involving crowds with gang members (Ander et al., 2020).

Injuries and lethal force

With respect to the fifth question, which concerned the effect of CEWs on injuries and lethal force, the findings from the interviews showed that the police officers perceived a CEW-related decrease in the risk of injuries for both the police and the counterpart. The informants argued that CEWs make it possible to eliminate the counterpart without the risk of major injuries in critical situations as well as in rapidly emerging situations, where the officers do not have time to be equipped with firearms. Most of the informants said that there is little risk of injuries with CEWs compared to batons and firearms, and CEWs are more humane than pepper spray; however, one respondent among the public said that they would rather be pepper sprayed than lose control to one's own body due to CEWs. Thus, we propose that it is important to not only focus on injuries but also on potential humiliation. The survey showed no significant differences between the study and control groups or between different timepoints regarding threats towards the police or injuries for the police or the counterpart. A possible explanation can be that the Norwegian police rarely resort to such measures (Henriksen & Kruke, 2020) and that they should always use the least possible force. Worth mentioning is that there were some differences between those having more experience from operational work reporting lower in exposure to violence or being harassed. In addition, the findings from the survey showed that counterparts rarely become injured in confrontations with the police (Figure 3). Therefore, these results must be interpreted with caution. Regarding lethal force, the findings showed no quantitative differences. A note of caution is due here since it very rare for the Norwegian police to incur deaths due to the use of lethal force. However, several informants believed that CEWs save lives. It is worth considering these statements as they have been made by experienced and tactically well-trained police officers who take their missions seriously. These results are consistent with data obtained in the Swedish study by Ander et al., (2020).

The findings from the current study corroborate the ideas of Ander et al., (2020), who suggested that it is difficult to draw any definite conclusions about how the use of CEWs affects injuries for police officers and counterparts. The experience among the informants is that the risk of violence and injuries is reduced, which is an important indicator; however, there are currently no reliable statistics that support these perceptions and experiences. Previous research has reached varied conclusions about the effect of CEW use on injuries among the police and the other party. Some studies from the USA and the UK have found a reduced risk of injury (e.g. Alpert, Smitt & Fridell, 2011; Jenkinson, Neeson & Bleetman, 2006), while other studies have not found such an effect (e.g. Smith et al., 2007; MacDonald et al., 2009). Further studies and systematic follow-ups over time are thus needed in order to be able to safely state how CEWs affect injuries for both the police and the counterparts in the Norwegian context.

Even if experienced police officers believe that CEWs saves lives, it is important to be aware of the risks involved with all uses of force. One of the informants described a situation within the Norwegian police in which the CEW did not have the intended effect, and the police had to use lethal force in a situation of fatal danger.

Effectiveness and tactics with CEWs

The present study was designed to determine the effectiveness of CEWs, and all informants were unanimous that CEWs are effective with a perfect hit, that is, when the arrows attach to the body or clothes at a sufficient distance from each other. However, as in the fatal danger situation above, a CEW does not always work as expected. There are factors to be aware of when using CEWs – for example, thick clothes, a moving target, and/or too great or too small a distance. The findings from the police records showed that 68% reported good effects when using CEWs, and 66% when threatening to use CEWs. These findings can be compared with those of Somers et al., (2020), who identified CEWs as being effective in 78% of deployments, while other studies have found them to be effective in 85-90% of deployments (Brandl & Strohshine, 2017; White & Ready, 2007; White & Ready, 2010). However, it could be critical to measure the effectiveness of CEW use depending on the situation and tactical decisions (den Heyer, 2020; Somers et al., 2020). One informant concluded that the limitations in CEW use must be considered in tactical training and reviews of interventions, that CEWs complement other forcible means, and that tactics and mental preparation are the most important factors to de-escalate a dangerous situation.

The seventh question concerned the tactical challenges and advantages with CEWs. One tactical issue is that the officers must be closer than the safety distance of 10 metres in a situation with a stabbing weapon because of the range of the CEW wires. Sandel, Martaindale, and Blair (2020) recently scientifically assessed the long-standing 21-foot (6.40-metre) rule as the standard for officers to safely draw and fire their weapons when being charged by a suspect whose intent is to cause harm. Their findings showed that 6.40 metres is too near and suggested at least 9.75 metres (32 feet) to be able to successfully draw and fire their weapons at a charging suspect. Conclusively, the authors believed that a distance of 9.75 metres is not practical for officers to maintain during all encounters; thus, they claim the importance of training in effective movement techniques that could mitigate this distance effect. The findings of Sandel et al., (2020) US study are in agreement with the results from the interviews in this study. The informants were aware of the safety distance of 10 metres and believed that tactical training and the ability to move in relation to the counterparts are important. However, the findings from the survey showed that tactical training has decreased during 2020 compared to 2018 and 2019 – probably due to the inconveniences caused by COVID-19. Nevertheless, this is something to

be aware of, especially with regard to the risk of increased mental health problems related to the pandemic. Since the findings from the interviews and the police records showed that the counterpart is often affected by mental illness, it is important to take tactical issues such as safety distance into consideration.

The findings from the interviews showed that, despite the limitations of CEWs, officers have the advantage of being able to act from a greater distance with CEWs than with batons and pepper spray. Further, consistent with the conclusions by Sandel et al., (2020), the findings from the interviews showed that the officers perceived CEWs as providing the opportunity to shift between being non-confrontational and more confrontational depending on the situation. In addition, they showed that it is important to maintain coordination with patrol colleagues. An important finding from the interviews related to the tactical challenges and advantages is where the CEW is placed in the continuum of force. It was suggested that if the CEW could be used earlier in a situation that is static, it would have a greater chance to fulfil the purpose, i.e. take control of someone. There is a risk that the officers might be instructed to wait for an attack, which would make the situation dynamic and more difficult to control; if the officer waits for an attack, it becomes increasingly difficult for them to get a perfect hit with the wires. If the arrows do not connect, the effect is absent, with the risk of a confrontation and injuries for both the police officer and the counterpart. The informants believed that CEWs should be on the same level as batons and pepper spray on the continuum of force. Adams and Jennison's (2007) US study showed that if CEWs are placed early in the use-of-force continuum, they will be used more often – something that demands more training in decision-making. They also pointed out that CEWs can have a de-escalating effect, which O'Brien and Thom also mentioned. In contrast, Ariel et al., (2019) argued that the presence of CEWs leads to increased aggression. Another study showed that less restrictive regulations on the use of CEWs are associated with an increase in the deployment of the weapons and a reduction in fatal shootings by police officers (Ferdik et al., 2014). Two further studies showed that more restrictive regulations on the use of CEWs are related to a decrease in the use of the weapon (Bishopp et al., 2014; Thomas et al., 2010), although in one study this was also related, if not significantly, to a lower level of deadly force (Thomas et al., 2010).

Demographic differences

Regarding the threat of using CEWs by the police, almost 90% of such circumstances during the two-year trial involved male officers. During the first year of trial, no female officer discharged CEWs, and only three female officers (7.7%) discharged CEWs during the second year. This finding is consistent with that of McElvain and Kposowa (2008), who examined 186 cases where police used firearms and found that male police officers were signifi-

cantly more likely to use firearms than female police officers. A recent Norwegian study, conducted before the CEW trial, found that male officers report slightly more frequent use of force than their female colleagues do (Henriksen & Kruke, 2020). A study from Washington, USA examined the total use of violence over a seven-year period and found no differences between male and female police officers (Hoffman & Hickey, 2005). There are relatively few studies that investigated gender differences in the use of violence by the police.

The results from the survey showed that male officers reported higher safety regarding transport and arrest methods as well as weapons as use of force than females. However, their use of CEWs showed no gender-based difference. Female officers reported feeling less safe than men, being physically attacked both before the trial and in 2019 and 2020. These gender differences are difficult to explain, but it seems that, although female officers feel safe with CEWs, they do not use them to the same extent as their male colleagues. Further, only one woman participated in the interviews; therefore, any gender difference in experiences of tactical and functional problems with CEWs may need to be further investigated.

Among subjects exposed to CEWs among the police, less than 10% were women. This is in line with Lindberg (2012), who found that 80% of the subjects were men. Henriksen and Kruke (2020) investigated police use of force in Norway, before the CEW trial, found that subjects are predominantly male. Somers et al., (2020) found that CEWs were less effective when used against males – a relationship that White and Ready (2010) did not find. In this study, too few women were subjected to CEWs for meaningful analysis.

Public relations

Regarding the police officers' approach towards citizens, the findings from the interviews showed that the informants had not perceived any negative opinions about CEWs. All informants stated that CEWs give them an alternative to other means of force without changing their attitudes. However, Adams and Jennison (2007) pointed to potential public relations problems that may arise if CEWs are used unsparingly to control situations in which, rather than being a dangerously violent individual, the subject is simply uncooperative and poses no obvious threat to police officers. Regarding the importance of maintaining good relations with the citizens, we included several measures of importance such as perspective taking, stress, and police anger management. The findings from the survey showed no significant changes during the trial period with perspective taking, with stress we found a significant decrease in stress in some of the situations with the study group, and no significant differences with anger management. This last outcome contradicts that of Ariel et al., (2019), who found that the presence of CEWs leads to increased aggression. Even

without significant changes, we noticed a decreasing trend with perspective taking within the study group; we therefore consider it important that these areas be studied regularly to be able to anticipate eventual changes that may affect the important relations with the citizens.

Public confidence in the police

The citizen survey results indicate that citizens believe police officers can be trusted regarding decisions related to the use of force – for example, decisions on when, what type, and how much force to use (Figures 15-17). The survey results also showed that citizens who had received some information on CEWs (had read about or seen them) were significantly more positive towards the CEWs than those who had no information (see Figure 21). Further, the group with information on CEWs also stated that they would feel more secure if police in their vicinity were equipped with CEW (see Figure 22).

In the police survey results, the relations between police and members of the public were considered to be good or very good (see "Contact with citizens" page 27). These results are confirmed by the police interviews. The interviewed police officers expressed that they had not experienced negative attitudes from the citizens regarding CEWs; instead, they described members of the public as having been positive and curious about them. The perceptions among police officers that the public had shown interest towards CEWs is also reflected in the results of the interviews conducted among the citizens and representatives.

The interviewed citizens and representatives expressed that public confidence in the Norwegian police was high and that the introduction of CEWs probably would not affect it. Citizens described that they believed police officers to be well educated and able to make the right decisions in their work. However, it was suggested that vulnerable populations and those directly affected by CEWs most likely have a lower level of trust in the police.

Citizens raised certain concerns which would be important if CEWs were to be introduced. One was the importance of the members of the public being given thorough information regarding CEWs and when and how the police would use them. Second, the police would have to be transparent about having used CEWs. There was an ambivalence among citizens regarding the introduction of CEWs. Informants expressed trust in the police and their competence but still raised concerns about the police carrying weapons. This aspect of the Norwegian police relates to a larger issue raised by the representatives and is presented in the results. Representatives had concerns about the symbolic effect of increased armament, as the Norwegian police have for a long time been equated with being unarmed and non-confrontational; as presented in the results, this change could affect their signal value and have other long-term effects.

This contrasts with a similar study conducted in Sweden (Ander et al., 2020), where the public justified the police being equipped with all the available means of force, including CEWs. Adding another forcible mean was not thought of as something that had a negative effect on the police's signal value.

Another concern raised among the citizens was that, in a long-term perspective, the Norwegian police could become more confrontational when equipped with CEWs and that this could result in an increase in the use of force.

Citizen's perceptions of injuries and safety

Citizens displayed an understanding of the CEW as a tool that can reduce the risk of injuries and even save lives; they also understood that CEWs can lower the use of other forcible means such as batons. Citizens and representatives expressed an awareness of those who could be directly affected by CEWs; specifically, these individuals are often fragile or vulnerable due to mental illnesses or drug abuse. It was considered beneficial that police could handle these persons without having to use significant force.

This is in line with results from the interviewed police officers, who described situations in which CEWs most likely prevented police officers from having to shoot and injure (or even kill) a counterpart as well as situations in which CEWs have protected the officers' colleagues from injuries.

Further, citizens believed that CEWs could make police officers feel safer in stressful or dangerous situations. If compared to what the police officers said themselves, this is partly true; although they have felt safe prior to having CEWs, they understand that they would be able to better handle certain situations.

Citizens also expressed that the general public could probably experience an increased sense of safety when knowing that police officers in their vicinity are armed with CEWs and can intervene quickly.

'Against who' and 'when'

The informants shared their views on when CEWs should be used as well as against whom. They felt that was more legitimate/justified for the police to use CEWs against those who had committed a criminal act or posed a danger to the public, compared to other counterparts. The informants expressed more hesitation about the police using it against persons who do not pose a threat – for example, persons with mental illnesses or drug addiction; nevertheless, they considered it legitimate for the police to use CEWs to save a suicidal person.

However, the results from the interviews with the police officers indicated that CEWs can be particularly useful in situations with those affected by mental illnesses or drug addiction as they may be difficult to control. This finding aligns with previous research indicating that CEWs is used more often against persons who are under the influence of drugs or have a mental illness (Bailey et al., 2016; Brandl & Stroshine, 2017). It is worth noting that studies have shown how deaths occurring in connection to the use of CEWs have involved interventions against individuals with drug addiction and/or mental illness (White et al., 2013).

This implies a need for targeted information to the public in order to increase legitimacy for the police using CEWs against these groups – something that has been pointed out in other studies (Oriola et al., 2016). Previous studies have also emphasised that more research on how CEWs are used against individuals with mental illnesses is needed (O'Brien & Thom, 2014; IPCC, 2014).

This specific issue has not been investigated thoroughly in this study, and we cannot state whether CEWs have been used more often against persons with mental illnesses than those under the influence of drugs. However, in the police records on the documented use of CEWs (see Table 16), police officers have provided information on the counterpart in situations where they threatened to use or used CEWs. In 43 out of a total of 91 situations in which they *threatened to use* CEWs, the counterpart had a documented mental illness or was suspected of having a mental illness. In 33 out of 91 situations, the police officers found it difficult to assess the mental state of the counterpart. Lastly, in 12 out of 91 situations, there were no suspicions of mental illness. When it comes to occurrences where CEWs were *used* against a counterpart, the numbers are slightly different (see Table 19). In 48 out of 73 of these situations, the counterpart had a documented mental illness or was suspected of having one. In 18 out of 73 situations, the police officers found it difficult to assess the mental state of the counterpart, and in only 7 out of 73 situations were there no suspicions of mental illness. This indicates that CEWs have been used in different ways with regard to persons affected by mental illnesses.

In their interviews, police officers stated that they did not experience CEWs being used against a certain group of people, but they pointed out that individuals with mental illnesses are often exposed to CEWs. The police records on the documented use of CEWs contain more detailed information on which situations and against which persons CEWs have been used; it would thus be valuable to conduct a systematic study of such records in the future.

Methodological reflections

One central strength of the evaluation is that we combined comprehensive quantitative survey data with qualitative interview data. We believe that these different methods have contributed to increased validity and reliability. The evaluation is centred on empirical data, and the results are based on a thorough analytical process conducted by an interdisciplinary research group.

There are some methodological considerations regarding each set of quantitative data. With the survey of the police officers, several key areas were covered where the most informative to the CEW introduction was presented. Further analyses are possible, but the ones included in this report are considered to be the most valuable in understanding the introduction of CEWs in this context. The response rate at the different data collections was good, approximately 68% in 2018, 55% in 2019, and 62% in 2020. Some signs of inconsistencies could be seen in how police officers self-reported as being in the study group but not having trained with CEWs or the reverse, which could influence how they answered some questions in different areas of the survey; a solution was to use two criteria when allocating the participants to the study group or control group to avoid contamination (Levin, 2005). Since we had complete data from 191 police officers with ID, we could use repeated measures methodology to study eventual change or interaction based on the study and control groups. Interaction effects are valuable in this context because the major difference between the study group and the control group can be attributed to the introduction of CEWs. Even so, there are several other variables that we cannot control in this context, but it is possible to conduct further studies in each area where differences between the groups have been encountered. For instance, a decision on the temporary general armament of the Norwegian police in November 2020 coincided with the last survey data collection. This may have affected the response patterns of some of the questions.

To secure valid observations, we included instruments based on previous studies adopting common factor modelling, in which several items are used to measure a construct. The constructs of interest are perspective taking (PT), a 5-item measure, or a 4-item measure from the police anger questionnaire aimed at anger management (AM). The fit of the models was investigated according to the recommended fit indices and their thresholds: chi-square, insignificant, Comparative Fit Index (CFI), and above 0.90, for an acceptable model but closer to 0.95, indicating a good model fit, root mean square error of approximation (RMSEA), with a value lower than 0.08, or the standardised root mean square residual (SRMR) with a value lower than 0.08 (Brown, 2015; Hu & Bentler, 1999). The calculated values for PT were an insignificant chi-square value=4.02, $p>0.05$, CFI=1, RMSEA=0 (0.00,

0.05), and SRMR=0.01. The corresponding values for AM estimated with WLSMW, since the measure had a 4-point answer scale, were an insignificant chi-square value=0.28, $p>0.05$, CFI=1, RMSEA=0 (0.00, 0.05) and WRMR=0.10. In terms of reliability, the measures could be considered reliable considering the number of items, and the calculated omega for PT was 0.74 and 0.60 for AM (Peters, 2014). Other measures with less evident factor structures were analysed at the item level, such as the stress instrument (PSIQ) or the use of force choice (UFC).

Some considerations should be taken into account in interpreting certain results. Several tables have been presented in how respondents rank different areas, such as the attained effect with different categories of use of force. It is important to note that the rank order is based on the mean of the responses attained from the group, but these responses can be based on a small group of participants and thus cannot be generalised.

The data from the citizens were valuable in including their perspective regarding change in perceptions after introducing CEWs. The only note of caution to consider is the overrepresentation of participants representing elderly groups, since it can be assumed that CEWs will primarily affect younger groups of citizens. No age difference could be detected in the data regarding being either positive or negative towards the use of CEWs, but the percentage of respondents belonging to the group under age 44 for 2019 and 2020 was less than 25%. It should be noted that the reported mean age of the counterparts according to the data based on the documented use of CEWs was 33 when they were threatened with CEWs and 38 when CEWs were fired and used. It would be valuable to study the opinions of younger groups in more detail.

Another area concerning validity existed in the initial plans to study individuals directly affected by CEWs. Several research questions have been developed regarding this group and the design for retrieving information. An instrument was developed that was proposed to be made available to all individuals who had been detained or taken into custody during the trial period to express their perceptions of the chosen method of force used against them, including CEWs. This makes it possible to compare any pattern that should be further analysed. The instrument also included opinions about how the action taken by the police officers was carried out during the encounter, if the action was based on facts, or if there was some aggression during the encounter, if they perceived the police officer to be receptive and open to what they had to say, and several similar items. However, due to juridical, practical, and ethical obstacles, this was not done. Nevertheless, it was possible to gather information on this topic through interviews, limited to some degree,

since it was not based on information from those directly affected. The results associated with these research questions are, therefore, absent and limited to some level.

An overarching validity question that applies to both the quantitative approach with different instruments, as well as the qualitative approach with interviews, is the language. A Swedish research team in the Norwegian context gathering different types of data and analysing it required some considerations regarding the language barriers. Several measures were taken, and we adopted the adaptation strategy with the instruments which is different from the strict translation strategy. Adaptation requires a Norwegian native speaker to adapt expressions in wording to fit the intended context. Here, we followed previous recommendations when translating instruments (van de Vijver & Hambleton, 1996). All interviews were also conducted with two researchers from the team to detect eventual inconsistencies in a topic; here we also set aside enough time to capture different nuances in an interview to allow the most valid interpretations. Even so, we are aware of the subjective aspects of each interview.

When assessing the rigour of our qualitative methods, we looked at the trustworthiness of our results. Analyses of the interview data were conducted systematically and consistently. To ensure internal validity, the analysis was carried out in such a way as to make it possible to trace

the results back to the original text. Representative quotations were used to verify the internal consistency and illustrate our analytical claims. Representative quotations also facilitate readers' ability to judge the trustworthiness of the results and add to the transparency of the qualitative analyses.

Dependability and transferability of this study are strengthened by clear and rich descriptions of the context, the participants, the collection, and analysis of data, in combination with a detailed presentation of the results (Graneheim, Lindgren, & Lundman, 2017).

A strength of the interview participants (both police officers and citizens) is the representation of both men and women, although only one female officer was interviewed. The participants shared a variety of perceptions and experiences regarding the CEW.

One factor that affected this study was the covid-19 pandemic. Initially, the plan was to conduct focus group interviews with police officers as well as citizens. However, we were not able to conduct these in person due to the pandemic, and we decided to conduct individual interviews via video calls instead (12 interviews). This led to fewer informants than we originally planned for, a potential weakness. However, combined with the rich quantitative data, we believe that this evaluation offers trustworthy results.

Conclusions

In this section, we present the conclusions that can be drawn from the results regarding the effects of the Norwegian police trial with CEWs. With regard to effects, we have limited ourselves to the report's questions, aware that there may, of course, be other effects in addition to those examined in this evaluation. The conclusions of the evaluation are presented below.

The police and CEWs

The Norwegian police's use of CEWs is significantly lower than that of the Finnish and Swedish police. When CEWs are used, they are often used against individuals with mental illnesses and threatening behaviours. CEWs do not seem to affect the Norwegian police's total use of force. However, CEWs can decrease the use of other forcible means, especially pepper spray. One of the more significant findings to emerge from this study is that CEWs can fill the gap between pepper spray/batons and firearms. The findings indicate that CEWs can replace the use of firearms under certain circumstances, although they do not replace firearms as a means of force.

Although the experience of the Norwegian police officers was that they could perform their duties without CEWs, they seemed to be able to resolve a situation with less intrusive force and less risk of injury when equipped with CEWs. In addition, with CEWs, they experience that they have the right equipment to perform their duties. Being able to resolve a situation with less force and having an alternative to using their firearms appears to make police officers feel safer. CEWs do not seem to affect injuries among police officers and counterparts, although findings from the police interviews indicate a lower risk of major injuries and lethal force.

One of our conclusions is that CEW is an effective tool to subdue someone, either through compliance or through an effective hit. However, the police describe the importance of being aware of the limitations of using CEWs, such as distance, thick clothes, and the difficulty of hitting a moving target.

Fewer than 10% of those involved in CEW situations are women, both among the police officers and those directly affected by CEWs. Female officers seem to feel as safe with CEWs as do male officers.

The police and the public

The police officers did not experience any changes during the trial in their own attitudes towards citizens. The introduction of CEWs does not seem to have a substantial effect on public perceptions of the police and public confidence in the police. Citizens appear to have a high level of trust in the police. Citizens with information about CEWs were significantly more positive towards CEWs than those without information. Members of the public had different perceptions regarding the police being provided with an additional weapon. Some indicated that CEWs could be an efficient tool for the police and that they would mean fewer injuries, whereas others objected to increased armament and what that could symbolise. There were also concerns that police carrying CEWs could lead to an increased use of force over time. Members of the public believe that the police are well-trained and competent in making decisions regarding the use of force, and they trust that this will be the case for the use of CEWs as well. However, it was indicated that those directly affected by CEWs, such as vulnerable populations, most likely had a lower level of trust in the police.

Recommendations

On the basis of the evaluation carried out and with the support of the present report, we provide the following recommendations:

- Further studies and systematic follow-ups over time are needed in order to be able to safely state how CEWs affect injuries to both counterparts and the police in a Norwegian context.
- We recommend establishing a feedback loop for data on and analyses of interventions, so that the experiences gained can be translated into guidelines and training, put back into practice, and then analysed once again.
- It is important to ensure that police officers are well trained in tactics and mentally prepared but also aware of the limitations of CEWs, such as risks in relation to CEWs not having the intended effect.
- We propose regular studies on police officers' stress, perspective taking, and anger management to be able to anticipate eventual changes that may affect legitimacy and the important relationship with citizens.
- Further studies are also required to investigate how the directly affected perceive the police's use of force in general and, in particular, to what extent and how CEWs are used against vulnerable persons.
- Continued efforts are needed to offer transparency and information regarding the use of CEWs by police, as this could maintain public legitimacy and trust.

References

- Adams, K., & Jennison, V. (2007). What we do not know about police use of Tasers™. *Policing: An International Journal of Police Strategies & Management*, 30(3), 447-465. doi:10.1108/13639510710778831
- Alpert, G. P., & Dunham, R. G. (2010). Policy and Training Recommendations Related to Police Use of CEDs: Overview of Findings From a Comprehensive National Study. *Police Quarterly*, 13(3), 235-259. doi:10.1177/109861110373993
- Alpert, G. P., Smith, M. R., & Fridell, L. (2011). *Multi-Method Evaluation of Police Use of Force Outcomes: Cities, Counties, and National, 1998-2007 [United States]*. Retrieved from: <http://doi.org/10.3886/ICPSR25781.v1>
- Amnesty International. (2004). *Excessive and lethal force? Amnesty International's concerns about deaths and ill-treatment involving police use of Tasers*. London, England.
- Amnesty International. (2018). *A failed experiment: the TASER-pilot of the Dutch Police*. Amsterdam, The Netherlands.
- Ander, M., Eriksson, M., Ghazinour, M., Hansson, J., Padyab, M., & Stjerna Doohan, I. (2020). *Elchockvapen som hjälpmedel vid polisiära ingripanden: En vetenskaplig utvärdering av Polismyndighetens försöksverksamhet med elchockvapen 2018-2019*: Umeå universitet.
- Ariel, B., Lawes, D., Weinborn, C., Henry, R., Chen, K., & Brants Sabo, H. (2019). The Less-Than-Lethal Weapons Effects "Introducing TASERS to Routine Police Operations in England and Wales: A Randomized Controlled Trial. *Criminal Justice and Behavior*, 46(2), 280-300. doi:10.1177/0093854818812918
- Axon. (2020). Solutions for Law Enforcement. Retrieved from <https://global.axon.com/taser>
- Azadani, P. N., Tseng, Z. H., Ermakov, S., Marcus, G. M., & Lee, B. K. (2011). Funding source and author affiliation in TASER research are strongly associated with a conclusion of device safety. *American Heart Journal*, 162(3), 533-537. doi:10.1016/j.ahj.2011.05.025
- Bailey, C. A., Smock, W. S., Melendez, A. M., & El-Mallakh, R. S. (2016). Conducted-Energy Device (Taser) Usage in Subjects With Mental Illness. *Journal of the American Academy of Psychiatry and the Law Online*, 44(2), 213. Retrieved from <http://www.jaapl.org/content/44/2/213.abstract>
- Barland, B., Høivik, J., Myhrer, T.-G., & Thomassen, G. (2017). *Som før, men TRYGGERE: Politiets vurdering av 14 måneders midlertidig bevæpning (As before, but SAFER: The police's assessment of 14 months of temporary armament) PHS Forskning 2017: 3*. Oslo: Norwegian Police University College.
- Bishopp, S. A., Klinger, D. A., & Morris, R. G. (2014). An Examination of the Effect of a Policy Change on Police Use of TASERS. *Criminal Justice Policy Review*, 26(7), 727-746. doi:10.1177/0887403414543558
- Blaho, K., Winbery, S., Park, L., Logan, B., Karch, S. B., & Barker, L. A. (2000). Cocaine metabolism in hyperthermic patients with excited delirium. *Journal of Clinical Forensic Medicine*, 7(2), 71-76. doi:<https://doi.org/10.1054/jcfm.1999.0344>
- Bozeman, P. W., Stopyra, P. J., Klinger, A. D., Martin, P. B., Graham, D. D., Johnson, C. J., . . . Vail, J. S. (2018). Injuries associated with police use of force. *Journal of Trauma and Acute Care Surgery*, 84(3), 466-472. doi:10.1097/TA.0000000000001783
- Brandl, S. G., & Stroshine, M. S. (2017). Oleoresin Capsicum Spray and TASERS: A Comparison of Factors Predicting Use and Effectiveness. *Criminal Justice Policy Review*, 28(3), 279-306. doi:10.1177/0887403415578732
- Braun, V., & Clarke, V. (2006). Using Thematic analysis in Psychology. *Qualitative Research in Psychology*, 3(2), 77-101. doi:10.1191/1478088706qp0630a
- Brown, T. A. (2015). *Confirmatory factor analysis for applied research* (Second edition ed.). New York: The Guilford Press.
- Campbell, F., & Clark, S. (2019). Penetrating facial trauma from a Taser barb. *British Journal of Oral & Maxillofacial Surgery*, 57(2), 188-189. doi:10.1016/j.bjoms.2018.12.009
- Clarke, C., & Andrews, S. P. (2014). The ignitability of petrol vapours and potential for vapour phase explosion by use of TASER® law enforcement electronic control device. *Science & Justice*, 54(6), 412-420. doi:10.1016/j.scijus.2014.04.004
- Crow, M. S., & Adrion, B. (2011). Focal Concerns and Police Use of Force: Examining the Factors Associated with Taser Use. *Police Quarterly*, 14(4), 366-387. doi:10.1177/1098611111423740
- den Heyer, G. (2020). An analysis of the effectiveness and use by the New Zealand Police of the TASER from 2009 to 2017. *International Journal of Police Science & Management*, 22(4), 356-365. doi:10.1177/1461355720947779
- Dymond, A. (2014). 'The Flaw in the Taser Debate is the Taser Debate: What do We Know about Taser in the UK, and How Significant are the Gaps in Our Knowledge?'. *Policing: A Journal of Policy and Practice*, 8(2), 165-173. doi:10.1093/police/pau011

REFERENCES

- Dymond, A. (2018). "Taser, Taser"! Exploring factors associated with police use of Taser in England and Wales. *Policing and Society*, 1-16. doi:10.1080/10439463.2018.1551392
- Dymond, A. (2020). Towards a socio-technical understanding of discretion: a case study of Taser and police use of force. *Policing and Society*, 30(9), 998-1012. doi:10.1080/10439463.2019.1660338
- ESV 2006:8. *Effektutvärdering: att välja upplägg*. Stockholm: National Financial Management Authority.
- Ferdik, F. V., Kaminski, R. J., Cooney, M. D., & Sevigny, E. L. (2014). The Influence of Agency Policies on Conducted Energy Device Use and Police Use of Lethal Force. *Police Quarterly*, 17(4), 328-358. doi:10.1177/1098611114548098
- Field, A. (2009). *Discovering statistics using SPSS: (and sex and drugs and rock 'n' roll)* (3. ed. ed.). Los Angeles: SAGE.
- FOR-2018-09-18-1648. (2018). *Instruks om bruk av elektrosjokkvåpen i politiet - prøveordning (Instructions for the use of CEW within the police - trial activity)*. Oslo: Ministry of Justice and Public Security.
- Ghazinour, M., Padyab, M., & Hansson, J. (2021). Police Stress in the Swedish Context: Development and Psychometric Properties of the Police Stress Identification Questionnaire. *Nordic Journal of Studies in Policing*, 2(1), 1-19.
- Graneheim, U. H., Lindgren, B.-M., & Lundman, B. (2017). Methodological challenges in qualitative content analysis: A discussion paper. *Nurse Education Today*, 56, 29-34. doi:10.1016/j.nedt.2017.06.002
- Hallett, N., Duxbury, J., McKee, T., Harrison, N., Haines, A., Craig, E., & O'Brien, A. J. (2021). Taser use on individuals experiencing mental distress: An integrative literature review. *Journal of Psychiatric and Mental Health Nursing*, 28(1), 56-71. doi:https://doi.org/10.1111/jpm.12594
- Henriksen, S. V., & Kruke, B. I. (2020). The Force Continuum: Prevalence and Characteristics of Police Use of Coercive Force. *Nordic Journal of Studies in Policing*, 7(1), 5-22. doi:10.18261/issn.2703-7045-2020-01-02 ER
- Ho, J., Dawes, D., Miner, J., Kunz, S., Nelson, R., & Sweeney, J. (2012). Conducted electrical weapon incapacitation during a goal-directed task as a function of probe spread. *Forensic Science, Medicine, and Pathology*, 8(4), 358-366. doi:10.1007/s12024-012-9346-x
- Hoffman, P. B., & Hickey, E. R. (2005). Use of force by female police officers. *Journal of Criminal Justice*, 33(2), 145-151. doi:10.1016/j.jcrimjus.2004.12.006
- Hu, L.-t., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural equation modeling*, 6(1), 1-55. doi:10.1080/10705519909540118
- Inzunza, M. (2015a). Adaptation and development of the Empathy Assessment Index (EAI). *International journal of comparative and applied criminal justice*, 39(3), 239-255. doi:10.1080/01924036.2014.989245
- Inzunza, M. (2015b). Empathy from a police work perspective. *Journal of Scandinavian studies in criminology and crime prevention*, 16(1), 60-75. doi:10.1080/14043858.2014.987518
- Inzunza, M., & Wikström, C. (2020). European police recruits' views on ideal personal characteristics of a police officer. *Policing & society*, 30(10), 1243-1262. doi:10.1080/10439463.2019.1685514
- IPCC. (2014). *IPCC review of Taser complaints and incidents 2004-2013*. London: Independent Police Complaints Commission.
- Jauchem, J. (2015). TASER B® conducted electrical weapons: misconceptions in the scientific/medical and other literature. *Forensic Science, Medicine, and Pathology*, 11(1), 53-64. doi:10.1007/s12024-014-9640-x
- Jenkinson, E., Neeson, C., & Bleetman, A. (2006). The relative risk of police use-of-force options: Evaluating the potential for deployment of electronic weaponry. *Journal of Clinical Forensic Medicine*, 13(5), 229-241. doi:10.1016/j.jcfm.2005.11.006
- Kaminski, R. J., Engel, R. S., Rojek, J., Smith, M. R., & Alpert, G. (2015). A Quantum of Force: The Consequences of Counting Routine Conducted Energy Weapon Punctures as Injuries. *Justice Quarterly*, 32(4), 598-625. doi:10.1080/07418825.2013.788729
- Katz, W. (2015). Enhancing accountability and trust with independent investigations of police lethal force. *Harvard Law Review*, 128(6), 235-245.
- Kroll, M. W., Adamec, J., Wetli, C. V., & Williams, H. E. (2016). Fatal traumatic brain injury with electrical weapon falls. *Journal of Forensic and Legal Medicine*, 43, 12-19. doi:10.1016/j.jflm.2016.07.001
- Kroll, M. W., Brave, M. A., Pratt, H. M. O., Witte, K. K., Kunz, S. N., & Luceri, R. M. (2019). Benefits, Risks, and Myths of TASER® Handheld Electrical Weapons. *Human Factors and Mechanical Engineering for Defense and Safety*, 3(1), 7. doi:10.1007/s41314-019-0021-9
- Kroll, M. W., Ritter, M. B., Kennedy, E. A., Silverman, N. K., Shinder, R., Brave, M. A., & Williams, H. E. (2018). Eye injuries from electrical weapon probes: Incidents, prevalence, and legal implications. *Journal of Forensic and Legal Medicine*, 55, 52-57. doi:10.1016/j.jflm.2018.02.013

- Kroll, M. W., Ritter, M. B., & Williams, H. E. (2017). Fatal and non-fatal burn injuries with electrical weapons and explosive fumes. *Journal of Forensic and Legal Medicine*, 50, 6-11. doi:10.1016/j.jflm.2017.06.001
- Kunz, S. N., & Adamec, J. (2019). A comparative brief on conducted electrical weapon safety. *Wiener Medizinische Wochenschrift*, 169(7), 185-192. doi:10.1007/s10354-018-0616-4
- Lawrence, D. S., Christoff, T. E., & Escamilla, J. H. (2017). Predicting procedural justice behavior: examining communication and personality. *Policing: an international journal of police strategies & management*, 40(1), 141-154. doi:10.1108/PIJPSM-07-2016-0107
- Levin, K. A. (2005). Study design II. Issues of chance, bias, confounding and contamination. *Evidence-based dentistry*, 6(4), 102-103. doi:10.1038/sj.ebd.6400356
- Lewis, M. C., & Lewis, D. E. (2016). Frontal Sinus TASER Dart Injury. *The Journal of Emergency Medicine*, 50(3), 490-492. doi:https://doi.org/10.1016/j.jemermed.2015.09.024
- Lindberg, D. (2012). *Police use of force: a review of the literature*. Portland State University: Criminology and Criminal Justice Senior Capstone Project. Paper 6.
- MacDonald, J. M., Kaminski, R. J., & Smith, M. R. (2009). The effect of less-lethal weapons on injuries in police use-of-force events. *The American Journal of Public Health*, 99(12), 2268. doi:10.2105/AJPH.2009.159616
- McElvain, J. P., & Kposowa, A. J. (2008). Police Officer Characteristics and the Likelihood of Using Deadly Force. *Criminal Justice and Behavior*, 35(4), 505-521. doi:10.1177/0093854807313995
- Nix, J., Wolfe, S. E., Rojek, J., & Kaminski, R. J. (2015). Trust in the Police: The Influence of Procedural Justice and Perceived Collective Efficacy. *Crime and delinquency*, 61(4), 610-640. doi:10.1177/001128714530548
- Norwegian Parliamentary White Paper No. 42 [2004-2005]. (2005). *Police role and tasks*. Oslo: Ministry of Justice and Public Security.
- Norwegian police. (2020). *The Police's Annual report*. Oslo: Politiet.
- Norwegian National Police Directorate. (2015). *Politiets trussel om bruk av skytevåpen eller bruk om skytevåpen 2002-2014 (Police threat of use of firearms or use of firearms 2002-2014)*. Oslo: Department of Police Preparedness and Crisis Management.
- Norwegian Police University College. (2016). *Utredning elektrosjokkvåpen (Investigation electroshock weapon)*. Oslo: Norwegian Police University College.
- Norwegian Police University College. (2018). *Training material CEW*. Oslo: Norwegian Police University College.
- NOU 2017:9. *Police and arming. Legality, necessity, proportionality and accountability*. Oslo: Departementenes sikkerhets- og serviceorganisasjon.
- O'Brien, A. J., & McKenna, B. G. (2007). Concerns About the Use of TASERs® On People with Mental Illness in New Zealand. *Journal of Forensic Nursing*, 3(2), 89-92. doi:https://doi.org/10.1111/j.1939-3938.2007.tb00110.x
- O'Brien, A. J., & Thom, K. (2014). Police use of TASER devices in mental health emergencies: A review. *International Journal of Law and Psychiatry*, 37(4), 420-426. doi:http://dx.doi.org/10.1016/j.ijlp.2014.02.014
- Oriola, T. B., Rollwagen, H., Neverson, N., & Adeyanju, C. T. (2016). Public Support for Conducted Energy Weapons: Evidence from the 2014 Alberta Survey. *Canadian Journal of Criminology & Criminal Justice*, 58(4), 530-564. doi:10.3138/cjccj.2015022
- Peters, G. (2014). The alpha and the omega of scale reliability and validity: Why and how to abandon Cronbach's alpha and the route towards more comprehensive assessment of scale quality. *The European health psychologist*, 16, 56-69.
- Pilant, L. (1993). Less-Than-Lethal Weapons: New Solutions for Law Enforcement. *International Association of Chiefs of Police*.
- Police Act. (1995). *Politi-loven*. Oslo: Justis- og beredskapsdepartementet.
- Police Executive Research Forum. (2011). Electronic control weapon guidelines. Retrieved from https://www.policeforum.org/assets/docs/Free_Online_Documents/Use_of_Force/electronic%20control%20weapon%20guidelines%202011.pdf
- Rappert, B. (2002). Constructions of Legitimate Force. The Case of CS Sprays. *The British Journal of Criminology*, 42(4), 689-708. doi:10.1093/bjc/42.4.689
- Rikander, H. (2017). The Use of Electroshock Weapons by the Finnish Police in 2016. *Nordisk Tidsskrift for Kriminalvidenskab*, 104(2), 119-152.
- Sandel, W. L., Martaindale, M. H., & Blair, J. P. (2020). A scientific examination of the 21-foot rule. *Police Practice and Research*, 1-16. doi:10.1080/15614263.2020.1772785
- Smith, M. R., Kaminski, R. J., Rojek, J., Alpert, G. P., & Mathis, J. (2007). The impact of conducted energy devices and other types of force and resistance on officer and suspect injuries. *Policing: An International Journal of Police Strategies & Management*, 30(3), 423-446. doi:10.1108/13639510710778822
- Smith, M. R., Kaminski, R. J., Alpert, G. P., Fridell, L. A., MacDonald, J., & Kubu, B. (2010). *A Multi-Method Evaluation of Police Use of Force Outcomes*. Retrieved from http://www.ncjrs.gov/pdffiles1/nij/grants/231177.pdf

REFERENCES

- Somers, L. J., Terrill, W., Rossler, M. T., & Ingram, J. R. (2020). Examining the Effectiveness of TASERS® at Gaining Citizen Compliance. *Criminal Justice Policy Review*, 31(8), 1234-1255. doi:10.1177/0887403419897953
- Strote, J., & Range Hutson, H. (2006). Taser Use in Restraint-Related Deaths. *Prehospital Emergency Care*, 10(4), 447-450. doi:10.1080/10903120600884863
- Sundqvist, J., Eriksson, M., Ghazinour, M., Hansson, J., Hjertstedt, M., & Padyab, M. (2021). *Initiativ Mareld: En studie av polisanställdas hälsa, arbetsmiljö och trygghetsskapande arbete i särskilt utsatta områden i polisregion Stockholm*. Umeå: Umeå universitet.
- Sunshine, J., & Tyler, T. R. (2003). The Role of Procedural Justice and Legitimacy in Shaping Public Support for Policing. *Law & society review*, 37(3), 513-548. doi:10.1111/1540-5893.3703002
- Swedish Research Council. (2011). *Forskningsetiska principer inom humanistisk-samhällsvetenskaplig forskning (Research Ethics Guidelines for Humanities Research and Social Sciences)*. Stockholm: Vetenskapsrådet.
- Sztajnkrzyca, M. D., & Baez, A. A. (2005). Cocaine, excited delirium and sudden unexpected death. *Journal of Emergency Medical Services*, 34(4), 77-81.
- Taylor, B., & Woods, D. J. (2010). Injuries to Officers and Suspects in Police Use-of-Force Cases: A Quasi-Experimental Evaluation. *Police Quarterly*, 13(3), 260-289. doi:10.1177/1098611110373994
- Terrill, W., & Paoline Iii, E. A. (2012). Conducted Energy Devices (CEDs) and Citizen Injuries: The Shocking Empirical Reality. *Justice Quarterly*, 29(2), 153-182. doi:10.1080/07418825.2010.549834
- Terrill, W., Paoline Iii, E. A., & Ingram, J. R. (2018). Beyond the final report: A research note on the Assessing Police Use of Force Policy and Outcomes project. *Policing: An International Journal*, 41(2), 194-201. doi:10.1108/PJPSM-04-2017-0047
- The Swedish Police Authority. (2020). *Slutrapport: Polisens försökverksamhet med elchockvapen*. Stockholm: Swedish Police Authority.
- Thomas, K. J., Collins, P. A., & Lovrich, N. P. (2010). Conducted Energy Device Use in Municipal Policing: Results of a National Survey on Policy and Effectiveness Assessments. *Police Quarterly*, 13(3), 290-315. doi:10.1177/1098611110373995
- Van de Vijver, F., & Hambleton, R. K. (1996). Translating Tests: Some Practical Guidelines. *European psychologist*, 1(2), 89-99. doi:10.1027/1016-9040.1.2.89
- Walker, J. T., & Maddan, S. (2008). *Statistics in Criminology and Criminal Justice: Analysis and Interpretation* (3rd ed.). Burlington, MA: Jones & Bartlett Learning.
- White, M. D., & Ready, J. (2007). The TASER as a Less Lethal Force Alternative: Findings on Use and Effectiveness in a Large Metropolitan Police Agency. *Police Quarterly*, 10(2), 170-191. doi:10.1177/1098611106288915
- White, M. D., & Ready, J. (2010). The Impact of the Taser on Suspect Resistance: Identifying Predictors of Effectiveness. *Crime & Delinquency*, 56(1), 70-102. doi:10.1177/0011128707308099
- White, M. D., Ready, J., Riggs, C., Dawes, D. M., Hinz, A., & Ho, J. D. (2013). An Incident-Level Profile of TASER Device Deployments in Arrest-Related Deaths. *Police Quarterly*, 16(1), 85-112. doi:10.1177/1098611112457358

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2020

Elchockvapen som hjälpmedel vid polisiära ingripanden: En vetenskaplig utvärdering av Polismyndighetens försöksverksamhet med elchockvapen 2018-2019. Polisutbildningens skriftserie, 9

Ander, Magnus; Eriksson, Malin; Ghazinour, Mehdi; Hansson, Jonas; Padyab, Mojgan; Stjerna Doohan, Isabelle

2020

Lokal resiliens mot våldsbejakande extremism – vad säger forskningen och vilka erfarenheter finns hos lokala offentliga aktörer och i civilsamhället? Polisutbildningens skriftserie, 8

E. Wimelius, Malin; Strandh, Veronica

2018

Regler om kroppsrannsakan: En rättslig undersökning av bestämmelser om kroppsvisitation och kroppsbesiktning med betydelse för polisens brottsbekämpande arbete. Polisutbildningens skriftserie, 7

Hjertstedt, Mattias

2016

Svensk polis i utlandstjänst: om erfarenheter av att arbeta i internationella missioner och att återvända hem. Polisutbildningens skriftserie, 6

Saati, Abrak; Wimelius, Malin E; Naarttijärvi, Markus

2016

Polisiär cykelpatrullering: en kunskapsöversikt och explorativ fallstudie om trafiksäkerhetsarbete i gång och cykelnätverk. Polisutbildningens skriftserie, 5

Rantatalo, Oscar

2015

En resa med tvång: erfarenheter av avvisningar och utvisningar av ensamkommande asylsökande flyktingbarn. Polisutbildningens skriftserie, 4

Ghazinour, Mehdi; Hansson, Jonas; Lauritz, Lars Erik; Padyab, Mojgan; Sundqvist, Johanna; Eklund Wimelius, Malin; Ögren, Kenneth

2014

Avvisningar och utvisningar av ensamkommande flyktingbarn: om effektivitet, värdighet och barnens bästa från tjänstemäns och gode mäns perspektiv. Polisutbildningens skriftserie, 3

Ghazinour, Mehdi; Hansson, Jonas; Lauritz, Lars Erik; Padyab, Mojgan; Sundqvist, Johanna; Eklund Wimelius, Malin; Ögren, Kenneth

2014

Ensamkommande flyktingbarns återvändande: om förutsättningar samt centrala aktörers roller och ansvar. Polisutbildningens skriftserie, 2

Ghazinour, Mehdi; Hansson, Jonas; Lauritz, Lars Erik; Padyab, Mojgan; Sundqvist, Johanna; Eklund Wimelius, Malin; Ögren, Kenneth

2011

Nordisk polisforskning: konferensskrift från den tredje nordiska polisforskningskonferensen, Umeå 2010. Polisutbildningens skriftserie, 1

Summary

BACKGROUND

From an international perspective, recent years have seen an increase in the use of conducted energy weapons (CEWs), which are used to control potentially dangerous and uncooperative people. In 2019 the Norwegian National Police Directorate launched a two-year trial of CEWs in daily police work.

AIM

The purpose of the current study was to evaluate the National Police Directorate's CEW trial and to explore the public's perceptions of police use of CEWs.

METHODS

The evaluation was designed as a cohort study with a participant and a control group. Quantitative and qualitative data were collected. Measurements before, during, and towards the end of the trial activity were carried out. Two groups of police officers answered the survey: those who were part of the trial activities with CEWs and those who were not part of the trial activities. To deepen our understanding, we conducted in-depth interviews with police officers who had experience with CEWs. To examine legitimacy aspects from a citizen perspective, we conducted a survey with citizens on three occasions. We also conducted individual interviews with citizens and representatives of interest groups to deepen and complement the survey results.

RESULTS

The current study found that CEWs are mainly used against individuals who are mentally unstable and exhibit aggressive and dangerous behaviour. The findings showed that CEWs fill the gap between pepper spray or batons and firearms and complement other forcible means. The findings from the interviews showed that the officers could resolve the situations before the introduction of CEWs, but with CEWs they could do so with less intrusive force and a lower risk of injury. According to the interviews, the officers felt safer mostly because CEWs gave them the opportunity to intervene without discharging their firearms. The survey revealed no significant differences between the study and control groups or between different timepoints regarding threats to the police or injuries for the police or the counterpart, while the findings from the interviews showed that the police officers perceived a CEW-related decrease in the risk of injuries for both the police and their counterparts. Informants were unanimous that CEWs were effective, but that there were factors to be aware of when using CEWs, such as thick clothes and a moving target. More than 90% of CEW situations during the two-year trial involved male officers, and among subjects exposed to CEWs from the police, fewer than 10% were women. The citizen survey results indicate that citizens believe police officers can be trusted with decisions related to the use of force. The survey also showed that citizens who had received some information on CEWs were significantly more positive towards CEWs than those who had no information. Further, the group with information on CEWs also stated that they would feel more secure if police in their vicinity were equipped with CEWs.

CONCLUSIONS

CEWs do not seem to affect the Norwegian police's total use of force. However, CEWs can decrease the use of other forcible means, especially pepper spray. The findings indicate that CEWs can replace the use of firearms under certain circumstances, although they do not replace firearms as a means of force. CEWs do not seem to affect injuries among police officers and counterparts, although findings from the police interviews indicate a lower risk of major injuries and lethal force. The introduction of CEWs does not seem to have a substantial effect on public perceptions of the police and public confidence in the police. Members of the public trust that the police are well-trained and competent in making decisions regarding the use of CEWs.

KEYWORDS

conducted energy weapon; legitimacy; perspective taking; police; Taser; trust; violence

