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Taser: Risks and Benefits

Abstract

The taser device (CEW), based on electric discharge, is one of the most controversial, legally used law enforcement tools ever, and its specific health risks to the affected subject have received much attention in the scientific and research literature. This paper aims to objectively evaluate the benefits and drawbacks of CEW by reviewing the literature. The SWOT analysis method was used to objectively assess the balance between the negative aspects and benefits of law enforcement, using Fuller's triangle as a paired assessment method to determine the individual weights of the identified strengths, weaknesses, opportunities, and threats. The resulting strategy for its prospects, based on the SWOT approach, was evaluated as an offensive S-O strategy, focusing on opportunities and on developing and further improving technology to strengthen the tool's strengths. In general, CEWs can be considered a valuable enforcement tool, but they are not risk-free.

Keywords: *taser; SWOT-analysis, risks, benefits.*

1. INTRODUCTION AND BACKGROUND

On the one hand, members of the public demand and expect state institutions to ensure the safety of the environment where they live, for themselves and their loved ones; on the other hand, they undermine their authority by deliberately inducing misconduct (e.g., verbal and passive challenges, according to Mercado, 2019) in their actions, recording interactions between the police and members of the public through the ubiquity of mobile phone devices, and further sharing these recordings with others. Members of the public are then subsequently concerned that some law enforcement officers may use specific enforcement

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tools inappropriately, out of convenience, or to intimidate citizens, thereby threatening the democratically set system. In turn, police officers may be “intimidated” by the presence of recording devices of members of the public recording interactions between them. They may be inclined not to use force, even though it may be legitimate and necessary, which may lead to an increase in crimes against police officers and, in turn, contribute to a chain reaction to the long-term problem of understaffing in the police force, an increase in crime, and an overall social crisis. This dichotomy then raises the question of where the optimal balance lies in public monitoring and evaluation of policing, and how to achieve it.

In general, tasers are powered by conventional lithium batteries and use a varying number of probes (electrodes) to deliver the generated electrical discharge, characterised by ultra-short, high-frequency, high-voltage, low-current pulses, to the affected subject. Different modes of application can be used. In the most commonly used distance mode, the probes are fired at different angles based on the effective range, and they are equipped with a sharp end piece to ensure a firm grip on the subject’s body (through clothing or directly into the skin) to complete the electrical circuit. The creation of an electric field and the cycling of electricity between the two probes (anode and cathode) causes temporary immobilisation (paralysis and convulsions) of affected subjects in a way that makes it easier for interveners to employ further conventional methods of physical restraint or other types of coercion to ensure the subject’s compliance with their instructions (Stevenson and Drummond-Smith, 2020; Sheridan and Hepper, 2022).

This paper aims to objectively evaluate the advantages and disadvantages of CEW based on existing scientific literature using the SWOT analysis method. The following research questions were posed:

Q1 What are the strengths, weaknesses, opportunities, and threats of CEW law enforcement?

Q2 What is the resulting strategy identified in the SWOT analysis for the CEW law enforcement resource?

2. MATERIAL AND METHODS

The different methods, such as analysis, synthesis, induction, and deduction, were used collectively to process the findings and the individual aspects of the CEW resource, identifying them as the primary input for the SWOT analysis. The essence of the SWOT analysis method (approach, framework, model, technique, or tool) is based on the evaluation of internal factors (strengths and weaknesses) and external factors (opportunities and threats as externalities that cannot be influenced appropriately and that may affect the object under study). It is a clear, practical, and functional method for analysing the topic (area), activity, or product under study. It is one of the oldest and most widely used traditional analytical tools worldwide, used for evaluating and selecting the optimal strategy and, possibly, for development planning (Puyt et al., 2023).

The reliability of the analysis and its resulting strategy depends on the amount of input available, and the more specific and complex it is, the more time-consuming it can be to process. For this paper, internal and external environmental factors were identified, including assigning values to each attribute, to analyse the current state of the area under consideration.

The weights of the identified elements (items) were determined using Fuller’s Triangle, a multi-criteria decision-making method, to prioritise relevant values in a critical, objective manner. Furthermore, the ratings of the individual aspects/elements were determined on a scale of 1 to 5 or -1 to -5 (depending on whether they are maximising or minimising), where the product of the weight value (significance levels ranging from 0.00 to 1.00) and the actual condition score (1 to 5; -1 to -5) then represents the value of the element/aspect, which is summarised with the other resulting values in the dedicated category (quadrant) and further worked with these results.

3. RESULTS AND DISCUSSION

SWOT Analysis of the CEW

Regarding the identification of the best available research evidence, the strengths and weaknesses (internal environment) of the electric remote enforcement technology and the opportunities and threats (external environment) in its use in a service police intervention have been identified (as shown in Table 1) through the SWOT analysis method and Fuller’s triangle (to determine the weights). This is not an analysis of the conditions for a specific intervention; the analysis undertaken considers the various factors identified to date in the scientific literature. The analysis is also not intended to make a definitive assumption about the safety of the device (to determine unequivocally whether the CEW is safe or not), but to consider, systematically analyse, and compare the potential risks and benefits of the technology in the context of the available force options and their ratio, based on the scientific publications studied. In general, the potential benefits and advantages of using the technology should reasonably outweigh the identified risks (a reasonable risk-benefit ratio), based on the assessment, according to Jauchem (2015) and Deuchar et al. (2024).

Table 1. SWOT Analysis of the CEW Taser (Source: Own processing)

POSITIVE			
Internal	STRENGTHS	Weight factor:	Assessment:
	High efficiency	0.25	3
	Meets electrical safety standards	0.20	4
	Objectification of the intervention of the force used	0.20	3
	Deterrence principle (de-escalation without discharge)	0.20	2
	Ease of use (less effort)	0.10	3
	Weather resistance	0.05	3
	Subtotal:	1	3.00
External	OPPORTUNITIES	Weight factor:	Assessment:
	Increasing the safety of responders (operational distance)	0.25	3
	Usability for subjects with suicidal tendencies	0.10	4
	Usability for highly dangerous subjects	0.25	4
	Potential to reduce the need to use a firearm	0.15	3
	Potential to reduce intervention duration and increase intervention effectiveness	0.15	2
	Further developments and technological improvements	0.10	5
	Subtotal:	1	3.40
NEGATIVE			
Internal	WEAKNESSES	Weight factor:	Assessment:
	Risk of failure (malfunction)	0.25	-5
	Cumulative exposure and latent risks	0.15	-4
	Restriction of use to at-risk groups	0.15	-3
	Restriction of use to a subject in motion	0.10	-3
	Risk of confusion with firearms	0.15	-3
	Economic costliness	0.20	-2
	Subtotal:	1	-3.45
External	THREATS	Weight factor:	Assessment:
	Weapon effect (promoting aggression of subjects)	0.20	-4
	Risk of overuse and "lazy cop" syndrome	0.25	-3
	Non-professional use by civilians (legislative changes)	0.15	-4
	Ambiguity of the degree, intensity and level of violence used (delegation to technology) - covert violence	0.10	-3
	Inadvertent or unauthorised use	0.10	-2
	Initiation of fire/explosion in a specific environment	0.20	-3
	Subtotal:	1	-3.25

In general, all human activity is a source of risk, and every use of force involves risk and may involve injury (every use of force has an impact on the subject receiving the force, the officer who uses the force, those close to the subject and other officers, the community in which the event occurred, etc., according to Cotton (2023)). Thus, no weapon or force option is risk-free and completely nonlethal, and the risk of medical harm to the affected subject is arguably the most debated with CEW enforcement. Danger can be defined as the potential for CEWs to cause serious negative consequences (a qualitative term), and risk is then the likelihood of the severity of those consequences (a quantitative term). The causality of the potential health damage to the subject caused by the use of the taser force option is shown in Figure 1.

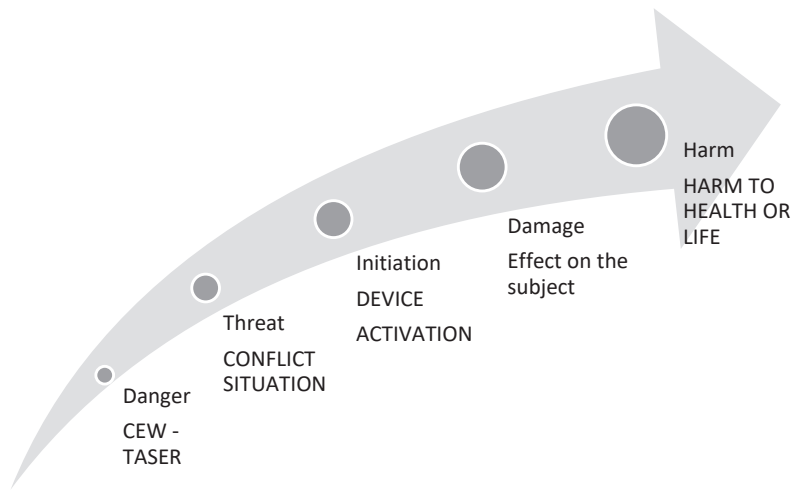


Figure 1. Causality of the occurrence of the negative phenomenon of potential health damage in a subject exposed to electrical discharge CEW (Source: authors' own work)

The police use of force in a CEW intervention requires appropriate measures in the risk management process to minimise it at the tactical (service intervention), operational, and strategic levels, to achieve a socially acceptable residual level of risk after the implementation of these measures. ²Unacceptable health risks may be posed by CEW, particularly when used in at-risk populations (often in combination with other risk factors and comorbidities present)³during cumulative exposure to applied pulse cycles, which may further aggravate

² The risk acceptance condition is expressed by the relation $R_{sact} \leq R_{sbar}$, where R_{sact} is the active risk that has been determined by its quantification, and R_{sbar} is the maximum socially acceptable risk (Tichý, 2006).

³ Given the findings of some studies where an increased likelihood of CEW use in at-risk subjects has emerged, the question is why some subjects have escaped without serious harm to their health. Beyond the stochasticity of exposure to CEWs and other identified stressors, it is possible, as in the OSH field, to speak of “near-misses,” i.e., events in which, by chance, no harm to health occurred despite the potential for it. As a result of still-unknown mechanisms of health damage, a discussion of the precautionary use of the device and the precautionary principle is warranted, especially for potentially at-risk populations (with a focus on limiting multiple and prolonged exposures). Paradoxically, however, the individuals who are most likely to experience adverse health effects following deployment are the same individuals who are most likely to be exposed to CEWs (O’Brien and Thom, 2014).

pre-existing severe health conditions and act synergistically, resulting in a fatal outcome of such a confrontation (Pasquier et al., 2011). However, the cardiovascular risks associated with changes in physiological functions of the affected subject are caused by stress of combined origin rather than by discharge itself.

In particular, irreversible (permanent) damage to health and life should be minimised (reduced), or the likelihood (and frequency of occurrence) of serious health risks should be low. For example, common electrothermal and morphological skin changes, such as mechanical injury to the superficial layers of the skin, are expected after penetration of CEW electrodes; i.e., these known risks have a high probability but relatively low severity of consequences (depending on the anatomical area affected). In contrast, for the affected subject, more serious health risks, such as post-activation falls and associated musculoskeletal trauma, or hitting sensitive areas, are “common” cases among a wide range of complications, showing a relatively low probability and frequency of occurrence⁴. In general, the relationship between probability and the consequences of risks is shown in Figure 2. There is currently insufficient data to predict individual CEW risks reliably; prevalence is unknown, and the epidemiological estimates published to date may not be objective. For example, Kroll et al. (2019) quantified the risk of serious injury at 6.4 cases per 1 million CEW shots. Furthermore, each CEW use situation in the field is unique with its variables and interactions, and thorough monitoring of the risks associated with CEW use is a necessary future measure as part of the overall risk analysis, management, and control process. As stated earlier, risk should continually be assessed and evaluated within a contextual framework (holistically) that is based on a balance between the level and intensity of resistance, the potential harm caused to those involved, the availability and capabilities of force types and levels, and their suitability for the specific situation (Jauchem, 2015) based on the choices of the interveners. It is essential to ensure that interveners are comprehensively trained (at an optimal level focused on the legitimate and correct use, as defined by the conditions) and prepared medical professionals (emergency service providers, as one of the punitive measures) to prevent the risks associated with this technology.

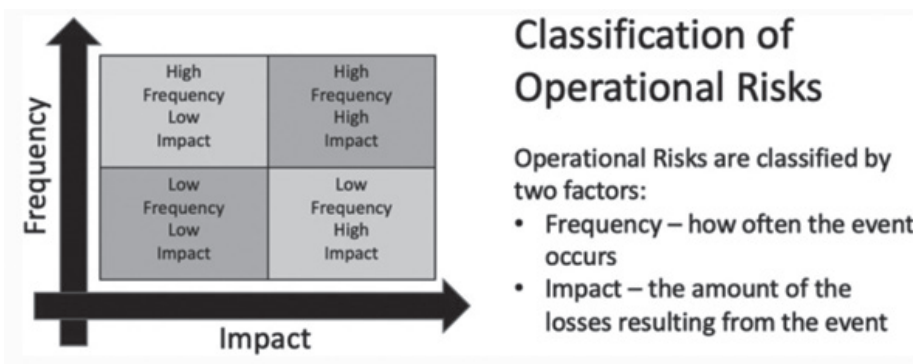


Figure 2. Operational risks, frequency (probability), and impact, consequence (Mulyana, 2012, cited by Cotton, 2023)

⁴ It is reported that approximately 1% of the probes fired hit the face (Thiel and Kaufmann, 2020) and an even smaller percentage hit the eye (Kaergaard et al., 2023).

It can be concluded that the use of CEWs generally poses a lower risk than firearms, and there is a lower likelihood of causing death to the affected subject; however, firearms are also not a lethal force in all cases, with an estimated fatality rate of around 50% for conventional firearms according to Sanford et al. (2011). Although CEWs can be considered a generally safer alternative to conventional firearms, they show significantly lower effectiveness compared to the latter. These findings make sense and are consistent with the force continuum and the ranking of CEWs below firearms. CEW is currently used by law enforcement agencies mainly as a higher form of force (the last stage before the use of a firearm). Given this fact and based on the findings of some studies, it therefore makes little sense to compare it to lower levels of force, as, over its history of use, many states have eventually come to restrict its legitimacy due to the numerous and serious risks it poses. Thus, there is a specific correlation between the effectiveness of a law enforcement tool (with respect to the safety of the interveners) and the severity of the consequences of the use of a law enforcement tool if it was (in)effective in the intervention, given the safety of the subjects against whom the intervention was conducted. In addition to ensuring that the subject is effectively incapacitated, the intervention must also address the appropriateness of using this coercive device in accordance with the principle of proportionality and avoid overuse, as successful application increases the likelihood of future decisions to use CEWs.⁵

*Table 2. Result of the SWOT Analysis of the CEW Taser
 (Source: Authors' own work)*

Internal (S+W):	-0.45
External (O+T):	0.15
Total score:	-0.30

The resulting strategy from the SWOT analysis conducted for the CEW law enforcement agent (see Table 2) is an offensive S-O strategy, recommending leveraging opportunities, development options, and further technological improvements to enhance the CEW's strengths.

The findings of the study (Sheppard and Welsh, 2022) suggest that less-than-lethal weapons, particularly CEW, represent a promising technique to reduce harm to citizens and responders, with effects more consistent with affected subject safety (Todak et al., 2015) than ensuring a 'safe working environment' for police officers (Dymond, 2020b). Safe and effective target disarmament (from a safe distance) can mitigate any resistance or force that could harm

⁵ The small effort of simply pulling the trigger of a device (the "lazy cop" syndrome, the theory of tendency to take the path of least resistance as part of human nature, when police officers may rely too heavily on tasers as substitute for conflict resolution, like de-escalation and communication skills or physical intervention; Deuchar et al., 2024), where, in addition, the intervener may not fully perceive the intensity and force of the hit compared to conventional coercive means, may lead to unnecessary prolongation of exposure and risky repetition of the discharge, which in turn may increase the severity of consequences for exposed subjects in confrontational encounters (Boehme et al., 2022b). However, it is not only the convenience of using this coercive device that may increase its overuse and affect the potential 'popularity' of the technology (Dymond, 2020b).

interceptors. These weapons are also designed to deter citizens from escalating the encounter to a point (higher level of aggression) where the interveners deploy higher levels of force, including firearms (Sheppard and Welsh, 2022). The study (Womack et al., 2016) indicated that the presence and use of CEWs may be a more beneficial tool (than their absence). Their use by police agencies is considered reasonable in terms of risk-benefit (Jauchem, 2015), where, based on the evaluation, CEWs are associated with a reduced risk of injury to the intervener during an on-duty intervention and therefore fulfil their intended purpose of increasing officer safety. The study also stated that it has never been confirmed whether the CEW is a universal tool suitable for dealing with any incident, as no weapon is a substitute for effective policing. No weapon should be incorporated into the range of force options available to the police at the expense of reducing basic subject communication skills and de-escalating tense encounters. It has been argued that CEWs should be deployed only when they genuinely represent a safer alternative to other forms of force (Sheppard and Welsh, 2022).

In highly dangerous situations, it therefore represents a less coercive means of coercion with less risk than firearms. However, CEWs are generally less effective than firearms; that is, they may not be effective in such situations. So, interveners must consider the risk of further escalation of the conflict, which may ultimately lead to the use of firearms anyway. The use of CEWs makes sense, particularly in situations where less risky forms of coercive force are unlikely to resolve a confrontational situation. In a confrontation, the safety of all parties involved (the actors in the incident) is important: the interveners, the suspects (the detainees against whom the intervention is being conducted), and third parties not directly involved (civilians, bystanders). If CEWs are to be legitimately used only in situations requiring lethal force, then they may not be preferable to firearms because they may be less effective, with potential negative consequences for the safety of the interveners. If used at lower resistance levels, they may cause disproportionate and unnecessary harm to some subjects (suspect safety). This creates a two-sided dilemma: the risk of harm may, depending on variables, outweigh the risk to the intervener rather than to the detainee, or vice versa. Generally, the priority is to maintain the safety of the intervening officers. When the focus shifts to the safety of a third, indirectly involved party, the use of CEWs may be preferable, particularly in high risk situations in locations where the use of a firearm may not be acceptable and could lead to additional danger and threats (generally locations with large concentrations of people, including mass transit and soft targets,⁶ where additional dangerous phenomena could arise given the presence, behaviour, and actions of the crowd during a shooting).

Thus, there is a call for the use of CEWs for the purposes for which they were initially developed and intended (use on board aircraft by reducing the risk of shell shock resulting from the use of a firearm), i.e., where the CEW represents a genuinely safer alternative than a firearm and at the same time a more effective means of managing and ending a highly dangerous

⁶ Publicly frequented places, spaces or events, easily attackable objects that are not permanently guarded by armed forces or in any other way, or not guarded at all, and are characterised in particular by a permanent or temporary high concentration of people, symbolic, cultural or religious significance, or form an important part of the infrastructure of the state, the disruption of which has a negative impact on the functioning of the system and thus on society (Terminological Dictionary of the Ministry of Interior, 2016). These include school facilities, libraries, shopping malls, clubs, restaurants, parks, etc. Soft targets are called due to weak protection against violent attacks (absence or low level of security), which become an attractive environment for an active attacker, due to the high concentration of people in a relatively small area (Hrinko, 2021).

situation, in which case it can be discussed as the preferred force option. Additionally, the use of CEWs to prevent risky behaviours or curb suicidal intent to commit such acts (people who are dangerous to themselves with self-injurious behaviours) can be beneficial. However, there is a risk of unintentional bodily harm from the application of a CEW and subsequent uncontrollable fall if the subject is in possession of, for example, a stabbing weapon.

Although there are some limitations on the circumstances in which CEWs may be authorised (and, in light of the findings of current scientific research, there may be further limitations on their use), there is no denying their undoubted utility as a new advanced technology of law enforcement and a form of force for law enforcement. The study (Hernandez-Perdomo and Mun, 2023) on financial risk analysis and scenario simulation has also been conducted to model the return on investment of using less-lethal weapons, including CEWs, as an alternative to conventional firearms. The study concluded that less-lethal technologies, including CEWs, not only reduce collateral damage, reputational, and legal risk but also prevent unnecessary deaths that undermine police legitimacy and public trust.

4. LIMITATIONS

The main shortcoming of this paper lies in the subjectivity of the evaluation process in creating the SWOT analysis, as well as in the suitability of this approach to such a complex issue.

5. CONCLUSION

This article evaluated and compared the balance of benefits and drawbacks (identifying strengths, weaknesses, opportunities, and threats) of CEW technology as a law enforcement tool, in the context of available force options, based on the findings of current research using the SWOT analysis methods, a critical elaboration of basic knowledge into a clear whole. It was found to be a generally beneficial technological law enforcement tool (its presence in the equipment is meaningful) for coping with future challenges in the internal security environment, with the main findings supporting the idea of its continued use adequate to the specific conditions of the situation, however, taking into account that its use is associated with risks, and based on the assessment it is important to focus within the identified S-O (offensive) outcome strategy on further technological development as exploiting the opportunities to upgrade and improve the asset to develop its strengths.

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Sažetak

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Električni paralizator: Rizici i koristi

Uređaj Taser (provodno električno oružje) koji se temelji na električnom pražnjenju jedan je od najkontroverznijih zakonskih mehanizama u povijesti, čiji su zdravstveni rizici za pogođenog subjekta dobili mnogo pozornosti u znanstvenoj i istraživačkoj literaturi. Cilj je rada objektivno procijeniti prednosti i nedostatke Tasera na temelju pretraživanja literature vezane uz tu temu. Metoda SWOT analize korištena je za objektivnu procjenu razine ravnoteže između negativnih aspekata i koristi od provedbe zakona, koristeći Fullerov trokut kao metodu parne procjene za određivanje pojedinačnih težina identificiranih snaga, slabosti, prilika i prijetnji. Rezultirajuća strategija perspektive njegove uporabe utemeljena na SWOT pristupu ocijenjena je kao ofenzivna S-O strategija, usredotočena na korištenje prilika, razvoj i daljnje poboljšanje tehnologija prikladnih za razvoj prednosti alata. Općenito, može se Taser smatrati korisnim alatom za provedbu zakona, ali uz određeni rizik.

Ključne riječi: električni paralizator, SWOT analiza, rizici, koristi.

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