



**CHALLENGES IN USING CLOSED-CIRCUIT TELEVISION IN POLICE OPERATIONS IN NAIROBI CITY COUNTY,
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ABSTRACT

Despite the police-operated closed-circuit television (CCTV) system in Nairobi City County being operational since mid-2015, insecurity remains a big problem. Hence, this study endeavored to establish the challenges hindering its effective use. The study used a convergent parallel mixed-methods design, integrating data from surveys, focus groups, and key informant interviews. The study sample was obtained from police officers operating CCTV and those attached to police stations in Nairobi County using cluster sampling and purposive sampling. Descriptive statistics were used to analyze quantitative data, while thematic analysis was used to analyze qualitative data. Findings showed that the most significant challenges confronting the CCTV system were inadequate funding, surveillance evasion, CCTV vandalism, and unrealistic public expectations. The study concluded that the system was underperforming and risked collapsing. It recommended increased and timely funding for the system, quick responses and harsher penalties for CCTV vandalism, and public awareness of CCTV.

Keywords: CCTV Use, Police Operations, Challenges, Public Space, Camera Site

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INTRODUCTION

CCTV is increasingly becoming common and widely used in policing (Kahn, Aziz, Faruk & Talukder, 2020). Many major cities worldwide, especially in developed countries, have public space CCTV systems that are operated by police or in collaboration with other security personnel (Lysova, 2022). While the scope, uses and objectives of CCTV systems vary by country and city (Baumann & Murray, 2021), the overarching goal is to improve police operations (Rahman, 2019).

CCTV has numerous applications and potential benefits to police operations. For example, it can aid in crime detection and responding quickly to incidents (Gogov, 2017; La Vigne, Lowry, Dwyer & Markman, 2011a), gathering intelligence (Moyo, 2019), and managing traffic (Eggarsasi & Sa'diyah, 2018). It can also aid in investigating crimes and obtaining evidence to prosecute offenders (Ashby, 2017; Carli, 2008). Such uses may increase the risk of offending, resulting in lower crime rates, crime fear, and the cost of police operations (Munyo & Rossi, 2019). Owing to such uses and benefits, CCTV has become a viable option for supplementing other police operational strategies and addressing the issue of police resource constraints.

Research demonstrates that the successful use of CCTV in policing depends on various factors. These include coverage, uses, police responses, monitoring practices and quality of images (Ratcliffe & Groff, 2019; Gerald et al., 2007), maintenance and upgrades, power supply, user skills, public attitudes, policies, and policing practices (Kerr, 2009). Others include maintenance, policies, evaluations (La Vigne et al., 2011b), and integration with other technologies (Brown, 1995). As such, police organizations may face unique challenges in implementing CCTV systems. Despite the fact that such challenges may cause CCTV systems to fail, studies have not explicitly addressed them. Although such challenges may cause CCTV systems to fail, studies have not explicitly addressed them. In fact, studies highlighting them concentrated on

other aspects of CCTV. Hence, the present study attempted to bridge this gap.

In Kenya, the use of CCTV in police operations is generally consistent with global trends. The first public space CCTV in the country, which only covered Nairobi Central Business District (NCBD), became available in 2009 (Noris, 2012). However, it no longer exists for unknown reasons. Since mid-2015, Nairobi County has had an operational police-monitored CCTV system. The system has over 1800 cameras, some integrated with automatic license plate recognition (ALPR) technology (NPS, 2016a). It covers major roads in the county and streets in the NCBD and is monitored around the clock. Its increased use is strongly recognized and emphasized by the National Police Service (NPS) in its strategic plan (NPS, 2019a). However, despite the significant resources invested in installing and running it and its importance in improving security and public safety, evaluations of its use are lacking. This makes it unclear whether the system supports police operations. Hence, determining the challenges affecting its use is worthwhile.

Statement of The Problem

In response to rising crime levels in Nairobi County, the Kenyan government installed a CCTV system for the police in mid-2015. The goal of installing the system was to improve police operational efficiency (NPS, 2019b). In the first six months of its implementation, the number of crimes recorded by the police in the county decreased by 28 percent (NPS, 2016b). However, they have since increased. For example, in 2016, 2017 and 2021, they increased by 13, 50 and 14 percent, respectively (NPS, 2017, 2021). These statistics indicate that the system has not performed as expected. Also, while several challenges can considerably reduce the effectiveness of CCTV systems, studies have not explicitly addressed them. Hence, this study sought to establish the challenges facing the police CCTV system in Nairobi County.

Study Objectives

The general objective of this study was to examine the use of CCTV in police operations in Nairobi City County, Kenya. Specifically, the study sought to establish the challenges in the use of CCTV in police operations in the county.

LITERATURE REVIEW

Empirical Review

The observations of La Vigne et al. (2011b) indicate that funding challenges may significantly impact the implementation of CCTV systems. This is due to the substantial funds needed to set up and maintain CCTV infrastructure, pay salaries for CCTV operators, and manage more crimes that come to the attention of the police (Piza, Gilchrist, Caplan, Kennedy & O'Hara, 2016). A study by Lawson, Rogerson and Barnacle (2018) in the United Kingdom (UK) found that the average cost of installing one CCTV camera in 2015 was pound sterling (£) 23,132, with an annual running cost of £3911. These costs mean that setting up and running CCTV systems with many cameras is prohibitively expensive and challenging for resource-constrained police organizations. A study by Hulme, Morgan and Brown (2015) on the use of CCTV by 221 Australian local councils illustrates how funding challenges negatively impact the implementation of CCTV systems. It found that 61 percent of the CCTV systems were not monitored, and 15 percent were only monitored occasionally due to insufficient funding. Hulme et al.'s study, however, focused on non-police-operated CCTV systems. Therefore, this study sought to establish whether the police-operated CCTV system in Nairobi County faced funding challenges.

While CCTV systems are sometimes installed to combat vandalism (Wilson & Sutton, 2003), studies show they are also prone to vandalism. Vandalism is the intentional destruction of property for various reasons, such as for fun, attracting attention, selling parts, and venting anger. La Vigne et al. (2011a) observe that CCTV systems have always been the target of various forms of vandalism, including cable

cuts, parts theft, and camera smashing or spray painting. Besides increasing maintenance costs through repairs, vandalism can result in footage loss or disruption, reducing the effectiveness of CCTV systems (La Vigne et al., 2011b). A UK study by Keval (2009) found that some CCTV cameras could not aid the police in monitoring public spaces since vandals had damaged them. As such, it was crucial to determine whether CCTV vandalism hampered the use of CCTV in police operations in Nairobi County.

Another major challenge in implementing CCTV systems is surveillance evasion. Surveillance evasion refers to criminals employing various strategies to avoid detection on CCTV. These strategies include using disguises, manipulating the environment, and exploiting patterns in police responses (Rahman, 2017). A study by Gill and Loveday (2003) in the UK on offenders' perception of CCTV established that they could evade CCTV detection by disguising their appearance. Similarly, Willis, Taylor, Lee and Gannoni (2017) discovered in an interview with police detainees in Australia that detainees committed crimes despite CCTV by turning their heads or covering their faces. Furthermore, Lindegaard and Bernasco's (2018) study on lessons learned from crime captured on CCTV found that determined offenders aware of CCTV cameras alter their behavior to remain unrecognizable. As surveillance evasion impedes the effectiveness of CCTV systems, this study sought to determine whether it was a problem in Nairobi County.

Research on whether public perceptions hinder CCTV use is conflicting. For instance, in Australia, Isnard (2001) established that the members of the public expect CCTV to deter all crimes and are disappointed when it does not. Likewise, in the UK, Levesley and Martin (2005) discovered that the public expects CCTV footage to be available at all times and interprets its absence as inadequate investigations by police or cover-ups. Another UK study by Gill, Bryan and Allen (2007) found that people's support for CCTV tends to wane over time,

particularly as they become more aware of its limitations. In contrast, a study by Moyo (2019) in South Africa revealed strong public support for CCTV despite the confusion about its capabilities and concerns about the invasion of privacy rights. Also, Gurinskaya's (2020) research in Russia found that citizen support for CCTV outweighs privacy concerns when they believe it improves safety and security. Nonetheless, these studies did not consider the Kenyan jurisdiction and police officers' perspectives. Also, they did not separate the public perceptions of CCTV cameras used by police and private entities. Therefore, this study sampled police officers in Nairobi County to determine whether they encountered negative public attitudes while using their CCTV system.

Cuevas, Corachea, Escabel, and Bautista (2016) observe that police officers' low interest in CCTV may impede its successful use. According to Levesley and Martin (2005), a key reason for the low interest is that police officers are rarely consulted during CCTV installations. Indeed, Goold (2004) discovered that CCTV systems installed by the UK government without involving the police were underutilized. Fatih and Bekir (2015) suggest that positive interest in CCTV can be cultivated through awareness-raising programs that explain the benefits of using CCTV. Nonetheless, there was no accessible study on how police officers' interests influence their use of CCTV in Nairobi County, necessitating this study.

Yau (2019) conducted a conceptual analysis of the use of CCTV in crime detection in Nigeria. The findings revealed that insufficient electricity supply and insufficient experts were significant challenges. They also indicate that recurrent power outages made it difficult for police to detect crime because they often disrupted CCTV monitoring and resulted in footage loss. The findings further indicate that CCTV systems were poorly managed and vulnerable to criminal hacking and manipulation due to a lack of experts. However, Yau relied on secondary sources, necessitating the need for primary

research on the challenges in implementing CCTV systems.

Theoretical Review

Rational Choice Theory (RCT) (Cornish & Clarke, 1986) and Routine Activity Theory (RAT) (Cohen & Felson, 1979) guided the study. RCT assumes that offenders are rational and avoid committing crimes when the risks outweigh the benefits (Cornish & Clarke, 2017). Thus, based on RCT, CCTV reduces crime because potential offenders believe it records their activities, increasing their chances of detection and arrest (Piza, 2018). However, CCTV may fail to do so if offenders are aware of its limitations. Hence, the study used RCT to explain the challenges in using CCTV when offenders have adopted surveillance avoidance strategies.

RAT, like RCT, is also based on rational choices. It asserts that a crime will occur only when a motivated offender encounters a suitable target without a capable guardian. Studies indicate that public space CCTV cameras are generally implemented to serve as guardians against crime (Piza et al., 2019; Reynald, 2011). They reduce the motivations of potential offenders to offend due to the perception that they may be watched and arrested (Reynald & Moir, 2018).

Additionally, research demonstrates that guardians are effective when they have some characteristics. These include being visible, being near targets, having clear visibility, actively monitoring targets, having the ability to detect potential offenders and being willing to intervene (Reynald & Moir, 2018; Reynald & Elffers, 2015; Reynald, 2011). These characteristics were relevant in this study in explaining the features of the police-monitored CCTV system in Nairobi that may render it ineffective. They were also helpful in explaining how police officers' competencies and interests may impede the successful use of CCTV.

METHODOLOGY

The study employed a convergent parallel mixed-methods design. The rationale for employing the

design was to overcome the limitations of using quantitative and qualitative methods alone and to increase the validity of the study's findings (Orodho, Nzabailirwa, Odundo, Waweru & Nadyambaje, 2016). The mixed methods elements used in the study were surveys, key informant interviews, and focus group discussions (FGD). As required by a convergent parallel design, data from the three elements were collected and analyzed separately and concurrently, and the findings were jointly interpreted (Orodho et al., 2016).

The study involved 402 police officers operating CCTV and those deployed to police stations in Nairobi County. Of the 402 officers, 374 were constables, non-commissioned officers (NCOs), inspectors, and superintendents sampled using cluster sampling and completed semi-structured questionnaires. Twenty-four of them were also purposively sampled constables and NCOs who participated in semi-structured FGDs. The remaining four were purposively selected high-ranking commanders who served as key informants (KIF). The participation of all participants was requested and was entirely voluntary and anonymous.

Data collection occurred between February and April 2021 after the relevant authorities had approved the study. Collected data were analyzed

using descriptive statistics for quantitative data and thematic analysis for qualitative data. Notably, 96 percent of the surveyed officers (358 of 374) returned questionnaires, but 347 were fit for analysis and reporting. The demographic characteristics of the survey respondents were consistent with those of the population of police officers in Nairobi County. For example, females were a third (33%), while males were two-thirds (67%). Constables accounted for 58 percent, NCOs (corporals, sergeants and senior sergeants) 26 percent, members of inspectorate 14 percent, and superintendents two percent. Furthermore, 72 percent, 23 percent, and five percent of the survey respondents were assigned to patrol and traffic enforcement, criminal investigations, and CCTV operator work, respectively.

FINDINGS AND DISCUSSIONS

The objective of this study was to establish the challenges to using CCTV in police operations in Nairobi County. The objective was accomplished by asking respondents to indicate how 11 challenges identified in reviewed studies hindered the use of CCTV in police operations in the county. Responses were captured on a five-point Likert scale ranging from 1 (*very little extent*) to 5 (*very great extent*) and in narrative form. Figure 1 summarises the descriptive results.

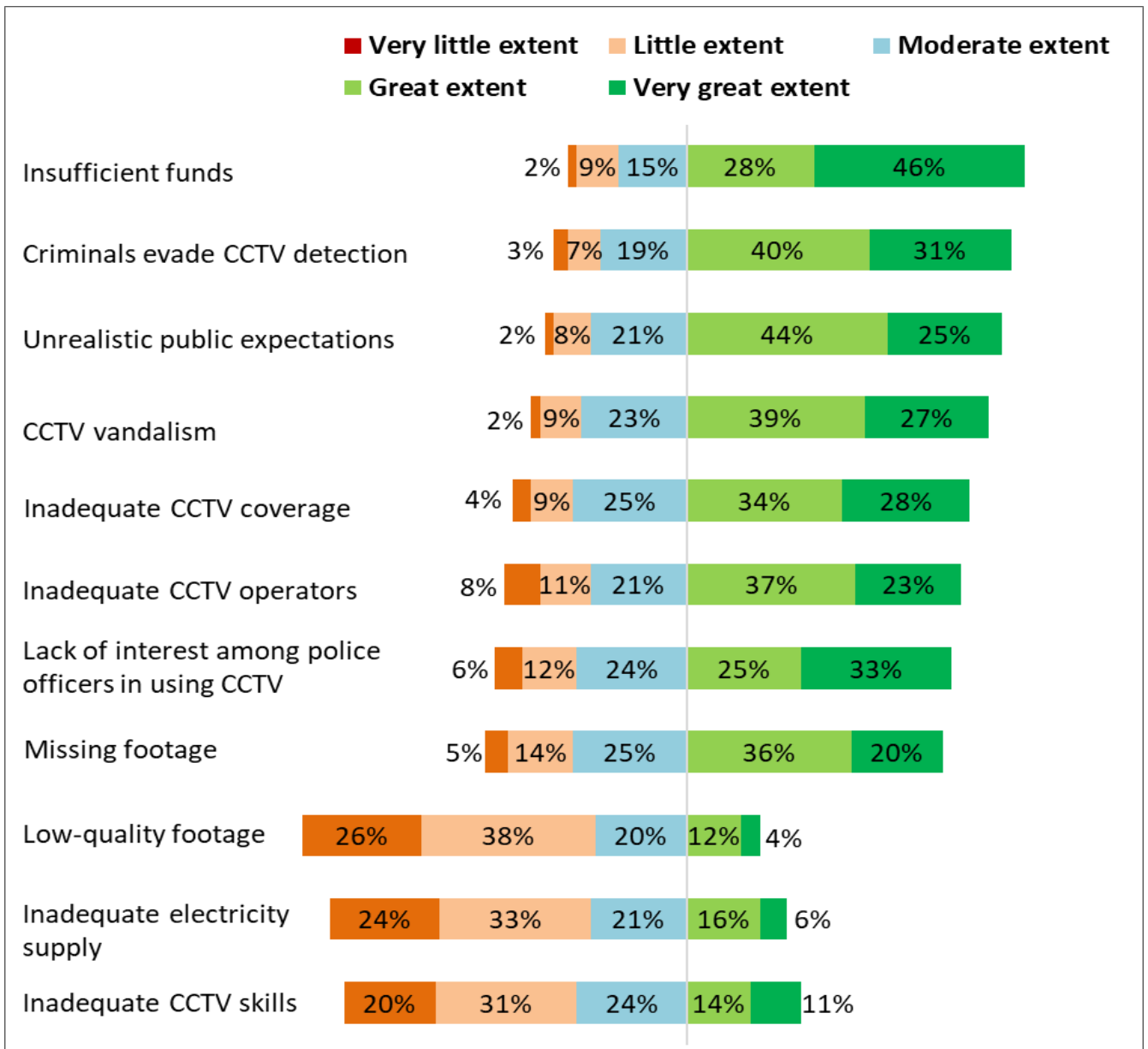


Figure 1: Respondents’ Ratings of the Challenges in Using CCTV in Police Operations in Nairobi County. N = 347; No. of Items = 11; Cronbach’s Alpha = 0.840

Figure 1 shows that the vast proportion of respondents (74%) said insufficient funding greatly hampered the use of CCTV, implying that it was the biggest challenge. Key informants and FGD participants confirmed this finding, noting that the police lacked adequate funds to maintain the CCTV system, including upgrading it or paying allowances to operators. A key informant said, “the cameras are not properly maintained because of a lack of funds, and a number have malfunctioned” (KIF IV). Likewise, a FGD participant lamented, “we used to get an allowance, but this is no longer there. When

we ask for it, we are told there is no money” (PTP A5). These observations suggest that funding for the CCTV system was not only insufficient but frequently delayed, making it difficult for the police to manage and use it effectively. The findings also agree with past studies that identify funding constraints as major impediments to successfully implementing CCTV (Lawson et al., 2018; Piza et al., 2016; Morgan & Brown, 2015). The findings further align with Chapman’s (2018) observation that limited funding impedes the effective

implementation and sustainability of policing technologies.

Inadequate funding also impacted CCTV coverage. The CCTV system only covered a few strategic locations in the NCBD and major highways and had not been expanded as planned. It could thus not aid police in managing incidents across the county. Two-thirds of respondents (65%) said limited CCTV coverage greatly hampered police operations (Figure 1). Key informant KIF IV said:

The cameras only cover a few areas. So, it is very challenging when incidents occur in areas without cameras, such as slums and backstreets in the NCBD, which are high-crime areas. Incidents in such areas go unnoticed unless reported.

The finding that limited CCTV coverage hampered police operations partly explains why crime has not decreased in the county despite the implementation of the CCTV system. It also backs up NPS's (2019b) claim that using CCTV cameras to detect crime in Nairobi County is insufficient. It further supports Morgan and Coughlan's (2018) and La Vigne et al.'s (2011a) assertions that inadequate coverage greatly reduces the effectiveness of CCTV schemes.

The limited CCTV coverage had further been exacerbated by vandalism and the destruction and removal of camera sites. Qualitative data revealed that criminals often destroyed and stole CCTV parts, disrupting CCTV coverage and reducing police effectiveness in managing crime in the affected areas. FGD participant PTP A8 reflected on this, saying that "theft of CCTV cameras, memory cards, screws, bolts, batteries, and poles was on the rise, rendering some cameras inoperable." Also, slightly over two-thirds of police officers who participated in the survey (66%) said vandalism greatly hindered police use of CCTV (Figure 1). These findings align with RAT's view that guardians are ineffective when they cannot detect offenders or observe targets.

It is worth noting that CCTV vandalism was unexpected because the cameras had tamper detection features and were more than five meters above the ground, out of the reach of most thieves. In addition, some camera sites had at least one pan-tilt-zoom (PTZ) camera and two bullet cameras, implying that the cameras protected each other. Following RCT's logic, these findings suggest that determined criminals had learned how to circumvent the protection measures. The findings also suggest that the police rarely responded to vandalism incidents, allowing criminals to vandalize CCTV equipment and fixtures with less fear of being arrested. These findings corroborate La Vigne et al.'s (2011a) observation that vandalism is a major challenge in using CCTV systems, as it increases repair costs and reduces effectiveness.

Besides vandals, drunken, reckless or lost-control drivers had destroyed several camera sites. Some camera sites had also been removed to make way for road expansion. In some instances, the constructions led to fiber optic cuts, disrupting the transmission of CCTV data. Key informant KIF I summarized this saying:

A number of camera sites have been demolished to pave the way for the ongoing construction of the GHZ3 road. The constructions have also disrupted the camera network as contractors often cut the fiber optic cables. In addition, reckless and drunk drivers have destroyed several road cameras by crashing into them. They've so far destroyed some cameras beyond repair, reducing their use in combating crime.

The above findings were concerning because they suggested that the limited CCTV coverage was shrinking even further. They also cast doubt on whether proper physical planning was conducted before installing the CCTV system or laying the fiber optic cables.

Not only had limited funding impacted CCTV coverage, but also footage availability. Owing to a

lack of funds for routine maintenance, some cameras had malfunctioned, gotten out of focus, or had their views obstructed, thereby not providing footage. These findings explain why more than half of surveyed officers (56%) stated that the lack of footage in some CCTV-covered areas hampered police operations greatly (Figure 1). One FGD participant commented as follows:

Trees, billboards and buildings have blocked some cameras, and several have malfunctioned. For example, the one at the HJK18 junction no longer rotates to capture events in all directions, thus not assisting much in monitoring and recording what is going on there (PTP, A3).

It is evident from the above quote that the absence of footage in CCTV-covered areas was due to cameras having obstructed views or being faulty. It is also clear that the obstructed views and faultiness were due to a lack of regular clearing of overgrown vegetation around camera sites and regular repair and adjustments of cameras. These findings support RAT that guardians are ineffective when they lack clear visibility. They also substantiate past studies indicating that unattended physical obstructions and a lack of regular maintenance of CCTV systems render them ineffective (La Vigne et al., 2011a; Keval, 2009; Keval & Sasse, 2008).

Although footage missing in some CCTV-covered areas was a significant challenge, footage quality was not. It was clear from the FGDs and key informant interviews that the police CCTV system recorded high-quality footage day and night due to its technical capabilities. As a result, the recorded targets and scenes were clear, distinguishable, and easily visualized. Key informant KIF II quipped: “the CCTV cameras are high-tech and record crystal-clear video images 24/7. They are digital and wireless... some have PTZ controls, which allow the viewing of targets remotely at varying distances clearly and vividly.” This finding is supported by two-thirds of survey respondents (66%), who indicated that low-

quality footage hampered police operations to a lesser extent (Figure 1). The finding contrasts those of Keval and Sasse (2008), which indicate that low-quality footage significantly hampered police operations, especially criminal investigations.

The quality of the footage was not, however, consistently excellent. A few FGD participants said it was sometimes blurry, hence least supporting criminal investigations and prosecutions. FGD participant PTP C2 said, “images from some cameras in industrial and construction areas are hazy and not much useful.” The implication was that the lack of regular maintenance of cameras, especially cleaning, impacted their ability to record high-quality footage.

FGD participants revealed that the number of CCTV operators was insufficient and negatively impacted their performance. They noted that frequent transfers and a lack of replacements caused the inadequacy. The inadequacy had, in turn, led to the operators working long hours and a single operator monitoring several cameras covering a larger area. This arrangement caused operators to become tired, lose focus, and miss recording some incidents. A CCTV operator commented:

Our strength was okay initially, but we're now a few due to transfers and non-replacement. Our few numbers have affected us so much. We work a 12-hour shift, which is very long and exhausting. The worst time to be on the screens is at night. The lights from street lamps and vehicle headlights strain the eyes much (PTP C7).

This quote attests that the number of CCTV operators was insufficient and their working conditions were relatively poor, lowering their productivity. These results help to explain why nearly two-thirds of respondents (60%) said the insufficient CCTV operators greatly hampered police operations (Figure 1). They also support Ubioworo's (2015) view that a CCTV operator is ineffective when monitoring a wide area or several cameras

simultaneously. This is because they would miss spotting events occurring in other areas while focusing on a given area or recordings from other cameras. The findings also echo prior studies showing that heavy workloads and long working hours reduce CCTV operators' productivity as well as the effectiveness of CCTV systems (La Vigne et al., 2011a; Dadashi, 2008).

Consistent with the reviewed studies, more than two-thirds of respondents (69%) said that unrealistic public expectations greatly hindered the use of CCTV (Figure 1). This finding was supported by the qualitative data, which revealed that the public had limited knowledge of the capabilities of the police CCTV system and the legal guidelines governing its use. As a result, they expected it to function flawlessly and questioned its reliability when it occasionally failed to support police operations. Some participants reported that the general public did not understand the limitations of the CCTV system and sometimes disparaged it, especially when footage of the incidents under investigation was missing. A key informant said:

I wish those who criticize or dismiss these cameras know how they have helped foil and solve many crimes in the city, including terrorist incidents. Nonetheless, there's nothing that is entirely perfect. The cameras can miss recording an incident because they are focused elsewhere or are defective. Also, the footage must be released in compliance with the law, which could result in it not being released or taking time (KIF II).

This quote indicates that the public expected the police to accomplish much with their CCTV system without understanding its limitations and was disappointed when it fell short. If the unrealistic expectations are unresolved, their confidence in the CCTV system may be lost, negatively impacting its success. These findings are consistent with prior research showing that the public often

misunderstands the capabilities of CCTV systems due to a lack of information, lowering their effectiveness (Noris, 2012; Levesley & Martin, 2005; Isnard, 2001). It is worth noting, however, that the findings of this study should be interpreted with caution because the data came solely from police officers.

While the public had unrealistic expectations about CCTV, many police officers were uninterested in using it. Over half of the officers who participated in the survey (58%) indicated that the lack of interest among police officers in using CCTV greatly hindered its use (Figure 1). The reluctance stemmed from several factors specific to an officer's deployment. For CCTV operators, it was due to a lack of allowances, long working hours, and the perception that their work was unappreciated. FGD participant PTP A54 said, "how can we work well when we don't get an allowance and when the service does not recognize the importance of our work?". These sentiments support Ansong and Ofori-Dwumfuo's (2015) findings that CCTV operators are reluctant to use CCTV when not adequately financially motivated. They also validate Singh's (2009) observation that CCTV operators dislike their work when they perceive their role and efforts are undervalued.

Like CCTV operators, patrol and traffic officers disliked being monitored by their superiors via CCTV while on duty. As a result, they avoided using radiophones equipped with cameras capable of taking and relaying real-time video of incidents to the command center for analysis. Equally, officers performing investigative duties disliked CCTV because they perceived it complicated their investigations and increased their workload and investigative time. A detective stated, "it is sensible and safe to avoid including CCTV video as evidence in your investigation file to avoid additional work and trouble in court" (PTP A1). These findings are consistent with previous UK research, which found that police officers least use CCTV when they believe it is burdensome (Levesley & Martin, 2005;

Goold, 2003). They also align with studies showing police officers are reluctant to use technology when they feel it erodes their discretion, introduces new levels of accountability or complicates their work (Rogers & Scally, 2018; Byrne & Marx, 2011).

Almost three-quarters (71%) of respondents said surveillance evasion hampered the use of CCTV greatly (Figure 1). The evasion forms included criminals wearing disguises and affixing fake license plates on stolen and getaway vehicles. A key informant remarked:

There have been many incidents of knife and gun-toting thieves on motorbikes who snatch items from unsuspecting pedestrians on the streets and highways. Most of these criminals are caught on CCTV. However, it is difficult to identify and arrest them because some wear masks and helmets that conceal their faces. Others also ride motorcycles with license plates that are fake or covered (KIF III).

This quote reveals that some criminals had learned the limitations of CCTV cameras and consequently adopted strategies to reduce their chances of identification and arrest. These findings uphold RCT's view that offenders are rational. They also echo prior research that criminals respond to CCTV and other policing strategies by altering their tactics to avoid detection and arrest (Jacques & Danielle, 2012; Gill & Loveday, 2003).

Respondents were also asked whether inadequate electricity supply hampered the use of CCTV. As shown in Figure 1, over half (57%) said it did so to a lesser extent. This finding was reinforced by qualitative data, which revealed that power outages were uncommon and were always quickly resolved when they occurred. A key informant KIF II said, "the electricity supply is sufficient, and power blackouts are rare. The command center also has a backup generator and the cameras have emergency backup batteries. So, our operations have never been disrupted." These findings contradict Yau

(2019) that insufficient electricity supply is a significant challenge in using CCTV. They also contradict Carli (2008) that many entities struggle to manage CCTV systems due to the high cost of supplying constant electricity and installing and maintaining standby generators. The conflicting findings may be explained by different contextual factors influencing CCTV use.

Although police officers' competency was a minor challenge, the competencies of officers operating CCTV and those deployed to operational duties were dissimilar. FGDs revealed that most officers operating CCTV had information technology (IT) qualifications and had received training on operating CCTV equipment and managing CCTV data. FGD participant PTP A3 remarked, "many of us have computer applications certificates, diplomas and university degrees in IT-related courses." Similarly, FGD participant PTP A6 said, "we've attended courses on operator skills, control room operations and procedures, and use of CCTV data in court." These findings contradict Gerrard et al. (2007) that all CCTV users, including CCTV operators, often have insufficient training.

In contrast, most officers performing operational duties had not received CCTV training. For many, their knowledge about CCTV was from experience and self-study. This is exemplified by FGD participant PTP C4, who stated, "I've not had any training on CCTV. My understanding of CCTV is from my own experiences, books, the internet, the media, court cases, and discussions with my colleagues." Key informants revealed that officers performing operational duties had not received training because they were not always dealing with cases involving CCTV evidence. Specialized officers handled most of such cases because of their technical complexities. This reason mainly explains why more than half of survey respondents (51%) said inadequate competencies among police officers hindered CCTV use to a lesser extent (Figure 1).

Past studies have also established disparities in CCTV user training. For example, Levesley and Martin's (2005) study in the UK found that volunteer operators received less training than their paid counterparts. Similarly, a home officer research by Gerrard et al. (2007) discovered that CCTV operators had received training while CCTV managers, police officers, and court officials had not. As user training influences the effective use of CCTV (Kerr, 2009), a lack of training of officers assigned to operational duties significantly hampered their use of CCTV.

CONCLUSIONS AND RECOMMENDATIONS

This study reveals that the police-operated CCTV system in Nairobi City County faces numerous challenges, which have contributed to its underperformance. The system functions poorly due to insufficient and unreliable funding, a lack of

upgrades, and poor maintenance. Its limited coverage has further been reduced by vandals, drivers who knock and destroy CCTV infrastructure, and the removal of camera sites to make way for road expansions. Generally, the system seems to be less aiding police operations, and public trust in it appears to decline. Therefore, if the challenges are not addressed, the system will fail to meet its goals and may collapse. Hence, the study recommends increased and timely funding for the CCTV system from the national treasury and other stakeholders. It also recommends that the NPS respond quickly to vandalism incidents, deploy adequate operators to the command center and improve their working conditions, and ask parliament to enhance CCTV vandalism penalties. The NPS should also regularly maintain the CCTV system and sensitize the public and police officers on its use and benefits.

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