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ORIGINAL PAPER

An Evaluation of a Community-Based Mobile Crisis Intervention Team in a Small Canadian Police Service

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Abstract

The current study examines the impact of a recently implemented community-based Crisis Outreach and Support Team (COAST) in a small Canadian police service. COAST pairs a police officer from the South Simcoe Police Service in Ontario, Canada with a crisis response worker from either the Canadian Mental Health Association or York Support Services Network. Through a pre- versus post-implementation analysis, key outcome variables were examined. Results demonstrated that there were significant differences between general patrol and COAST in terms of time spent on crisis-related calls and this was associated with a reduced cost to the service. Additionally, compared to pre-implementation rates, the Service saw an increase in community resources provided to clients in need and a decrease in involuntary apprehensions. These initial findings provide some preliminary support for the value of the COAST initiative in the South Simcoe Police Service.

Keywords Mobile crisis response team · Police · Mental health · Community mental health services

Police officers are traditionally conceived as individuals who are responsible for enforcing laws and fighting crime. However, over time, their role has expanded and they are now frequently asked to provide assistance to individuals who have not committed any crimes, but are instead experiencing serious levels of personal distress. Increasingly, these calls for service involve persons with a mental illness (PMI; Coleman and Cotton 2016). Indeed, it is estimated that between seven and 31% of police-public interactions in Canada involve a PMI (e.g., Boyce et al. 2015; Brink et al. 2011; Shapiro et al. 2015), depending on the geographic location (Cotton and Coleman 2010). The increase in these types of encounters appears to be a product of numerous factors, including the deinstitutionalization of PMIs from psychiatric treatment facilities, changes to mental health laws, and reductions in hospital beds and hospitalizations (e.g., Cotton and Coleman 2006; Lamb et al. 2002; Shapiro et al. 2015). Despite reductions in institutional resources, community resources have not been bolstered to fill the resulting gap in mental health care (Niles 2013; Simmons 1990). This has contributed to a revolving door phenomenon where police have frequent contact with the same individuals who are often unable to access long-term, appropriate care. Labels such as "psychiatrists in blue" or "institutional gatekeepers" are now commonly used to describe police officers and the role they play in deciding whether the mental health system (MHS) or criminal justice system (CJS) is the most appropriate place for PMIs (Menzies 1987).

Despite the broadened role played by police officers in Canada, calls that involve people in crisis present challenges for officers, especially when the individuals are suffering from mental health issues. Research suggests that officers do not necessarily feel adequately prepared to respond to these situations (e.g., Fry et al. 2002; Godfredson et al. 2011; Reuland et al. 2009). Furthermore, these calls are often perceived as unpredictable and dangerous to the officer, the community, and the PMIs themselves (e.g., Bower and Petit 2001; Compton et al. 2008; Reuland et al. 2009; Strauss et al. 2005). The police are often criticized by the public for both the criminalization of PMIs (e.g., Lamb et al. 1995; Schulenberg 2016) and the inappropriate use of force towards this population (e.g., Rossler and Terrill 2016). Despite this criticism, processing a PMI through the CJS is sometimes done in the individual's (perceived) best interest given the lack of mental health resources available

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in the community. For example, it appears that some officers will charge a PMI with a minor offense to allow them access to treatment that they may not otherwise receive (Lamb et al. 2002; Markowitz 2006; Menzies 1987; Wood et al. 2011).

Overall, the perceptions that PMIs have towards the police in Canada appear to be mixed and depend on a range of factors (Coleman and Cotton 2014). For example, the attitudes that police officers have towards PMIs appear to influence how PMI's perceive their interactions with police officers (Jones and Mason 2002). The nature of the interaction also appears to influence how PMIs perceive the police. For instance, in a recent survey of homeless individuals from Edmonton, Alberta, a large portion of which were thought to have a mental illness, significantly more negative evaluations of the police were reported by respondents if they had been handcuffed during the interaction with police (Krameddine and Silverstone 2016). Perceptions that PMIs have of the police also appear to vary based on location. In contrast to the results found for PMIs in Edmonton, interviews conducted with PMIs in Vancouver, British Columbia (B.C.) revealed that the majority of PMIs believed the police had treated them humanely and with respect (Livingston et al. 2014). In fact, almost 70% of participants reported that the quality of service (and the outcome) related to their last interaction with a police officer was better than expected (which may be surprising in light of Krameddine and Silverstone's findings considering that almost 75% of the sample in the B.C. study reported being handcuffed by police at least once during their lifetime).

While PMIs present a challenge for front-line officers, they additionally consume a lot of police resources due to the frequency of calls they are involved in and the extensive emergency department (ED) wait times after a PMI has been apprehended (Provincial Human Services and Justice Coordinating Committee [PHSJCC], 2011). Schulenburg (2016) found that calls involving a PMI were, on average, 20 min longer than non-PMI related calls. Additionally, individuals apprehended under the *Mental Health Act* (MHA) in Canada actually spend more time in the ED than those waiting for medical care (Lamb et al. 2002). Because police must typically remain in the ED while the PMI is waiting to be seen by a physician to be admitted or released, this can mean that police officers are tied up for many hours in the ED, which prevents them from carrying out other duties (some research has shown that police officers in Canada can regularly wait four or more hours in the ED when handling calls related to PMIs; Clarke et al. 2007; PHSJCC 2011; Pizzingrilli et al. 2015).

Police services have attempted to address the various concerns highlighted above in various ways. One approach that will be focused on in the current paper is the development of the mobile crisis intervention team (MCIT) model, which often involves the collaboration of a mental health professional (e.g., social worker) and a specially trained police officer in providing an integrated response to crises (Shapiro et al. 2015). The aim of MCITs is to provide support to people in crisis (especially those suffering from mental health issues), relieve the pressure on front-line officers and EDs, and improve the short- and long-term outcomes for clients (Lamanna et al. 2018). Improving service outcomes for PMIs has been noted to occur through fair treatment, matching client needs with appropriate community resources, and diversion from the criminal justice system and ED (Steadman et al. 2000). Furthermore, literature suggests that an officers' knowledge of community resources influences the outcome of the calls they attend (Lamb et al. 2002), which may suggest that MCITs will have a positive impact on client outcomes given that team members will likely be more aware of community resources. This has been supported in a critical review of joint police mental health collaborations in Ontario, Canada, which revealed that different methods of informal diversion were used depending on the police detachment and the social services available in the community (PHSJCC 2011).

Evaluations of these types of programs have demonstrated promising, but mixed results. In a pre-post implementation evaluation with a control area that did not have access to such a program, Kisely et al. (2010) found that, despite an increase in mental health calls, the time spent on calls decreased after program implementation. Additionally, when compared to the control area, there was greater community services engagement. Considering that the clients in Kisely et al.'s study received more support from their community, this may be expected to translate into better care for these individuals. Similarly, with the implementation of MCITs, primary response units (i.e., general patrol officers without the specialized training) have been demonstrated to be released from scenes involving people in crisis sooner, which allows these officers to focus on other matters (Allen Consulting Group 2012).

While some hospital-based initiatives[1] have found that MCITs escort individuals to the hospital more (e.g., Lamanna et al. 2015; Lee et al. 2015), community-based MCITs, such as the type examined in the present study, are generally associated with fewer transports to hospital (Allen Consulting Group 2012; Scott 2000). In addition, studies involving both community- and hospital-based MCITs have demonstrated a reduction in time spent in the ED by MCITs (Allen Consulting Group 2012; Fahim et al. 2016; Lamanna et al. 2015), presumably because individuals involved with

[1] Hospital-based initiatives work through partnerships with nearby hospitals and will largely use mental health nurses, whereas community-based initiatives like COAST work with community mental health agencies like the Canadian Mental Health Association.

these teams (e.g., compared to general patrol officers) develop stronger relationships with clients and can communicate their needs more effectively to ED staff. Overall, transports to the ED, and the subsequent time spent there, can greatly influence call time. Given the decrease in transports that are predicted to be associated with community-based MCITs, and the shorter time spent in the ED, it is expected that MCITs will spend less time per crisis-call compared to general patrol.

Additionally, the benefits of MCITs appear to translate into cost savings for police organizations. For example, Scott (2000) found that there was a 23% cost savings per case associated with the MCIT approach to dealing with crises in comparison to police-only teams. In addition, if general patrol officers are released sooner from cases they are involved in because of assistance from a MCIT, further cost savings to the organization may ensue. Qualitative interviews with various stakeholders (e.g., service users, general patrol officers, mental health professionals) have revealed additional benefits associated with MCITs (e.g., clients have reported feeling respected and listened to by team members, felt they had an opportunity to give input regarding their own care, and valued the expertise of the mental health professional involved in the MCIT; Kirst et al. 2015).

Overall, then, it appears that MCITs are potentially associated with some promising outcomes for police organizations and the communities they serve. However, there is not a large body of literature examining these issues, especially in Canada (Kirst et al. 2015). While "MCIT" acts as a broad term, these teams often vary in terms of where they are located, the populations they serve, the community resources that can be accessed, program mandate, staffing, training, and equipment (Kean et al. 2012; Ligon 1997; Shapiro et al. 2015). Given all these differences, it is currently unclear whether the results from previous studies of specific MCITs can be generalized to the MCIT being considered in the current study. Thus, it is worth examining South Simcoe Police Service's (SSPS) MCIT in its local context.

The Current Study

The current study will examine the Crisis Outreach and Support Team (COAST) initiative implemented by the SSPS and its mental health partners by conducting a pre-post evaluation. First, we will descriptively examine the program's use (e.g., time spent on in-progress calls as opposed to follow-ups, the nature of the calls). Following this, we will examine the following hypotheses, which were based on previous literature: (1) Client impact hypotheses—(1a) Relative to general patrol, COAST will refer clients to community resources more often, and (1b) will take individuals to the hospital via apprehension or (1c) voluntary admission less often; (2) General patrol hypotheses—(2a) the time spent on crisis-related calls will decrease on average for general patrol officers after the implementation of COAST, (2b) which will in turn reduce the cost to the service; (3) Hypotheses comparing general patrol and COAST—(3a) COAST call times will be shorter on average than general patrol, (3b) which will result in a lower cost per call for COAST as compared to general patrol; and (4) COAST will spend less time on average in the ED compared to general patrol officers.

Methods

Study Setting

The MCIT under investigation in the current study is a community-based team that was implemented by the SSPS in October 2017, in partnership with the Barrie branch of the Canadian Mental Health Association (CMHA) and the York Support Services Network (YSSN). The SSPS consists of 84 full-time officers and the Service polices 486 square kilometres of land and a population of approximately 74,320 people (SSPS 2017). This area is split into two districts, one of which consists of a significant portion of rural land. To put the location in perspective, it takes officers approximately 40 min to drive from one end of their jurisdiction to the other. While patrol officers in the SSPS may generally work in one district, COAST is responsible for providing service to the entire jurisdiction.

Crisis Outreach and Support Team

Within the SSPS, COAST consists of a crisis response worker (CRW) and an active duty police officer. The CRWs have designated days they work during the week (Wednesdays, Thursdays, and Fridays). Each CRW is from one of two nearby community resource centres (the CMHA or the YSSN). The team of two CRWs have between 10 and 36 years of crisis-related experience, with educational backgrounds ranging from social service worker to baccalaureates in criminal justice and psychology. Additional training includes addictions, developmental services, and suicide intervention. Like the CRWs involved with COAST, the police officer on the team has a great deal of relevant training and experience. He has been a police officer for 17 years and has taken numerous specialized training courses, including Mental Health First Aid, suicide intervention, Critical Incident Stress Management, Crisis Intervention, and various other de-escalation courses. He has a baccalaureate in psychology and is completing a master's degree in criminal justice.

At the time of the study COAST operated from Tuesday to Friday between the hours of 10 am and 8 pm (the police

officer responds alone 1 day a week when a CRW is unavailable), however it has since expanded to Monday to Friday. As a team, and when the COAST officer responds alone, COAST acts as a secondary response unit, which responds to crisis-related calls. Both the CRW and officer work in a plain-clothes capacity and operate an unmarked vehicle. Essentially, COAST and general patrol are both dispatched to a call and once the call has been deemed safe, then general patrol officers hand the call over to COAST and respond to other calls. Thus, one of the goals of COAST is to provide additional support to patrol officers who do not have extensive training in how to interact with the types of clients related to the call. Through their expertise, COAST is able to connect individuals with relevant community resources when applicable instead of relying on hospital-based interventions. The team also conducts follow-ups to further support and ensure clients' well-being. Finally, the team is involved in community engagement activities (e.g., presentations to community groups) to spread awareness about the program, as well as provide program progress updates to various stakeholders.

Materials

Standardized Reporting Forms

Standardized reporting forms were used to facilitate data collection. Each outcome variable selected to evaluate the COAST initiative was decided on in collaboration with the SSPS through a series of meetings and ride-alongs. Each variable was chosen because it was thought to be an important indicator of the initiative's potential success, while also being able to be easily recorded. All of the variables captured on the standardized reporting forms are described in detail below. Other outcome variables were considered, including the use-of-force by police and arrest rates related to people in the community, but these variables were deemed not feasible given how infrequently they occur in this police jurisdiction.

The forms captured various information including the date, time, location, and origin of the request (e.g., telecommunications operator, general patrol), as well as whether the call was in-progress, a follow-up, or a community engagement activity. An in-progress call consists of a situation that is actively unfolding, whereas a follow-up call is one where COAST contacts an individual that the service had previous contact with and where there is no active crisis. Community engagement activities consist of meetings (e.g., with various stakeholders), educational activities (e.g., school presentations), and awareness events (e.g. community events).

The forms additionally captured the primary nature of the call (i.e., PMI, person in crisis [PIC], suicide-related, assist medical, or well-being check). A PIC was defined as an individual "whose behaviour brings them into contact with the police either because of an apparent need for urgent care within the mental health system, or because they are otherwise experiencing a mental or emotional crisis involving behaviour that is sufficiently erratic, threatening or dangerous that the police are called in order to protect the person or those around them" (Iacobucci 2014, p. 4). It is worth noting that the definition focuses on the person and their behaviour, without making assumptions about the reason for it (e.g., mental illness; Dubé 2016). If the call information is considered to involve a PIC, then the COAST officer selects the presence, if any, of various identifiers (i.e., whether the individual is thought to be experiencing neurodevelopmental difficulties, dementia, emotional difficulties, addiction, brain injury, drug effects, or some other factor). In contrast to a PIC, a PMI was considered an individual who came into police contact and it was known to the officer that they suffered from a mental illness. While originally a suicide-related call was captured as its own call type, for the purpose of the analyses it will be combined with PICs given that a suicidal individual would certainly qualify as being in crisis.

The COAST officer additionally recorded if the individual in question had received prior COAST support, is a repeat contact to the Service, or if the individual is being diverted from the ED or criminal justice system. Various time variables, including the time it took from the original call for service for the responding unit to arrive on scene (time to scene), time spent in the ED if applicable (total ED time), and the total time spent on the call (total call time), were recorded from the service's Record Management System. Total call time was defined for the purpose of this study as the cumulative amount of time spent responding to the call for service (i.e., including time to scene, time spent on scene, and time spent in the ED, if applicable).

Additionally, call disposition was recorded which indicates the outcome of the call as: resources provided, voluntary admission to hospital, involuntary apprehension under the MHA, whether a community crisis bed was used, or if service was not provided. Possible resources provided to the person include connections to crisis-line supports, addictions resources, housing, or case management options. Apprehensions under the MHA may occur when a police officer reasonably believes that a person

is a risk to others or themselves (through intent to cause harm or neglect of self-care), and the client is believed to be experiencing a mental disorder. If the individual was apprehended under the MHA then it was indicated on the data collection form whether the attending physician admitted them under a Form 1,[2] a transfer of care occurred (e.g., the hospital takes over custody of the person for reasons that are primarily medical in nature), or the individual was released from the hospital. Finally, considering that a CRW often responds with COAST, the community agency to which they belonged was also indicated on the data collection form.

An additional outcome variable that was not recorded on the data collection form, but was calculated using the time spent on the call, was the cost to the police service. The cost of a call was calculated by considering the rate of a first-class constable in the SSPS per minute ($0.77) and multiplying that rate by the number of officers responding to the call and the total call time. When COAST responds to a call, the cost is half that of general patrol per minute because only one officer is responding and the cost of the CRW is covered by the respective community agency (CMHA or YSSN). SSPS policy necessitates a two-officer response to crisis-related calls, therefore the cost in minutes was multiplied by two for general patrol calls. For example, if general patrol reports a total call time of 45 min (this includes time to scene and any time spent in the ED), then the cost would be $0.77 × 2 officers × 45 min, for a total of $69.30 for the call.

Procedure

The current study examined the SSPS' response to crisis-related calls over a 12-month period from May 1st, 2017 to April 30th, 2018. Midway through this time period, COAST was implemented, allowing for an examination of the initiative by comparing various outcomes pre- and post-implementation. More specifically, 6 months of historical data from May 1st, 2017 to October 31st, 2017 was collected and compared to 6 months of data collected between November 1st, 2017and April 30th, 2018 when COAST was operating. When officers of the SSPS responded to crisis-related calls, the COAST officer was responsible for collating information from the police Record Management System and inputting it into a standardized form. When the police reports from the patrol officers were unclear, the COAST officer would seek out clarifying information from the responding officer. Only one form was completed for each call for service. Therefore, if patrol responded to a call and handed it over to COAST, then this was considered a COAST call and the form was only completed on their behalf. In this case, all of the information recorded was in regard to their response, not general patrol's (e.g., any time patrol spent waiting for COAST would not be captured in the form). All data were entered into the Statistical Package for the Social Sciences Version 26 (IBM Corp, 2013) to allow for analyses to be completed. No cleaning of the data, or transformations, were required.

[2] A Form 1 is an Application by Physician for Psychiatric Assessment; it allows a doctor to hold an individual for up to 72 h involuntarily for assessment (Ministry of Health and Long-term Care, 2016).

Table 1 Frequency of in-progress calls by responding unit and day of the week

Day of the week	Responding unit		
	General patrol before *n* (%)	General patrol after *n* (%)	COAST *n* (%)
Monday	39 (18.5%)	42 (21.5%)	0 (0.0%)
Tuesday	32 (15.2%)	36 (18.5%)	13 (17.1%)
Wednesday	28 (13.3%)	30 (15.4%)	16 (21.1%)
Thursday	30 (14.2%)	19 (9.7%)	32 (42.1%)
Friday	31 (14.7%)	24 (12.3%)	15 (19.7%)
Saturday	26 (12.3%)	19 (9.7%)	0 (0.0%)
Sunday	25 (11.8%)	25 (12.8%)	0 (0.0%)

Compliance with Ethical Standards

Informed consent was not obtained because the data was created through extracting information from case files and did not involve the researchers interacting with individuals for the purpose of data collection. This study was approved by Carleton University's Research Ethics Board CUREB-B (Clearance #108000).

Results

The Nature of Calls

The dataset consisted of 709 crisis-related calls in total, which are divided in Table 1 by both the responding unit (i.e., general patrol or COAST) and whether the file is from the 6-months before or the 6-months after the implementation of COAST. General patrol officers responded to 211 in-progress calls before, and 195 in-progress calls after COAST implementation. In contrast, COAST completed 287 calls, which included 76 in-progress calls and 211 follow-ups. COAST additionally completed 16 community engagement activities, which consisted of meetings (e.g., with stakeholders; $n = 8$), educational activities ($n = 6$), and awareness events ($n = 2$). In-progress calls were distributed throughout the week for general patrol and between Tuesday and Friday for COAST (which is when the team operates), as presented in Table 1. Notably, while calls for general patrol

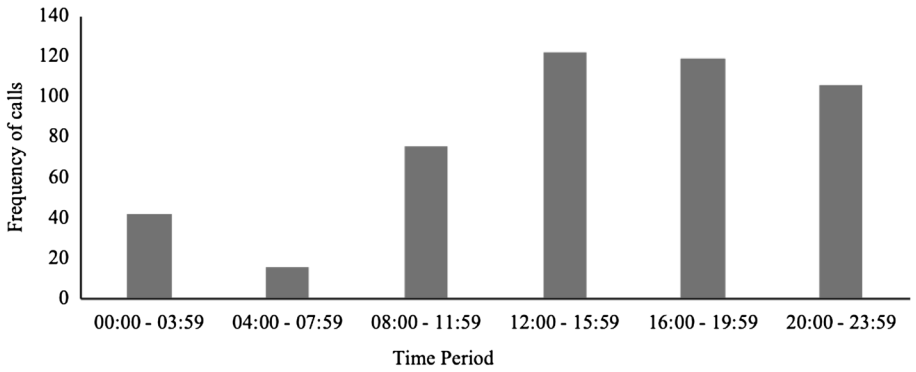

Fig. 1 Frequency of in-progress calls by time period for the SSPS

Table 2 Frequency of type of in-progress call

Type of call	Responding unit		
	General patrol before *n* (%)	General patrol after *n* (%)	COAST *n* (%)
Mentally ill	119 (56.4%)	94 (48.2%)	10 (13.2%)
Person in crisis total	85 (40.3%)	95 (48.8%)	60 (78.9)
Person in crisis	4 (1.9%)	44 (22.6%)	53 (69.7%)
Suicide-related	81 (38.4%)	51 (26.2%)	7 (9.2%)
Assist medical	2 (0.95%)	2 (1.0%)	1 (1.3%)
Well-being check	5 (2.4%)	4 (2.0%)	5 (6.6%)

Table 3 Nature of the PIC during in-progress calls

Nature of the PIC	Responding unit		
	General patrol before *n* (%)	General patrol after *n* (%)	COAST *n* (%)
Neurodevelopmental dysfunction	1 (0.5%)	8 (4.1%)	6 (7.9%)
Dementia	0 (0.0%)	2 (1.0%)	4 (5.3%)
Emotional	4 (1.9%)	35 (17.9%)	43(56.6%)
Addiction	0 (0.0%)	4 (2.1%)	6 (7.9%)
Brain injury	0 (0.0%)	1 (0.5%)	8 (10.5%)
Drug-induced	1 (0.5%)	6 (3.1%)	6 (7.9%)
Other	0 (0.0%)	1 (0.5%)	3 (3.9%)

remained reasonably consistent across days of the week, COAST appears to respond to substantially more calls on Thursdays. Overall, most crisis-related calls for the entire service occurred between noon and midnight (see Fig. 1).

General patrol officers responded to proportionately more in-progress calls involving a PMI than a PIC, both before and after COAST implementation, whereas COAST responded to more PIC-related calls (see Table 2). However, after the implementation of COAST, general patrol officers responded to significantly more calls involving a PIC and less involving suicidal individuals and PMIs than before implementation, $\chi^2(4) = 42.63$, $p < 0.001$. When considering COAST alone, most of the in-progress calls related to PICs. When considering follow-up calls, the distribution of call type included mental illness-related calls (19.9%), suicide-related calls (15.6%), and well-being checks (1.9%).

When examining the nature of the PIC that was involved in the calls, the most common identifier of PIC was *emotional*[3] for both general patrol officers and COAST (see Table 3). The increased use of the term PIC after the implementation of COAST resulted in more identifiers being used (as they may only be selected if the individual is identified as a PIC). Regarding follow-up calls only ($n = 211$), PICs were most frequently identified as *emotional* (57.8%). However, much less frequently, *addiction* (5.7%), *dementia* (3.3%), *neurodevelopmental consideration* (2.4%), *brain injury* (1.9%), or some *other factor* (1.4%) was perceived to be at the root of the crisis. Most of the COAST calls did not include an individual who had received prior support from COAST (80.9%) or the police service more generally (75.2%). This was also true for the calls responded to by general patrol officers (80.3% and 69.2%, respectively).

Impact on Call Disposition

When examining call disposition (i.e., resources provided, voluntary admission to hospital, apprehension), there are notable differences between general patrol officers and COAST (see Table 4). To examine Hypothesis 1 (a), (b), and (c), a chi-square test of independence was conducted and the unstandardized residuals were used to examine whether there was a difference in call disposition between COAST and general patrol. Analyses revealed that COAST provided significantly more resources (1a) and apprehended less often (1b) than general patrol officers after implementation, $\chi^2(2) = 10.67$, $p = 0.005$. However, there were no significant

[3] The term *emotional* was applied if the individual appeared to be experiencing a situational crisis; for example, any sudden, drastic change in a person's life such as the death of a family member or loss of a job.

Table 4 Frequency of call dispositions for in-progress calls

Disposition	Responding unit		
	General patrol before *n* (%)	General patrol after *n* (%)	COAST *n* (%)
Resources provided	26 (12.3%)[a]	58 (29.7%)[b]	32 (42.1%)[c]
Voluntary	51 (24.2%)[a]	42 (21.5%)[a, b]	10 (13.2%)[b]
Apprehension	80 (37.9%)[a]	56 (28.7%)[b]	9 (11.8%)[c]

Superscripts are used to represent significant differences between general patrol before and after COAST implementation and general patrol and COAST during the after implementation phase. When the comparison groups have different superscripts, there is a significant difference

differences between general patrol and COAST in terms of voluntary admissions to the hospital (1c), $p > 0.05$. Therefore, Hypothesis 1 (a) and (b) were supported, but 1(c) was not.

A second chi-square test of independence was completed as an exploratory post-hoc analysis to examine if the demonstrated benefits of COAST implementation (in terms of COAST providing more resources and apprehending less than general patrol) may have resulted in extended benefits to general patrol officers and therefore the SSPS more generally. Consistent with this possibility, the second test revealed that general patrol officers provided significantly more resources and apprehended clients less often after the implementation of COAST, $\chi^2(2) = 17.29$, $p < 0.001$.

During COAST's follow-up calls, resources were provided almost half of the time (48.3%). However, excluding the high proportion of follow-up calls where no one answered (47.4%), resources were provided the vast majority (91.9%) of the time. Overall, when COAST did not provide services to a client, it was usually because the individual was unavailable (34.0%), either because they were not on scene for in-progress calls or because they did not answer a follow-up call. Otherwise, not providing services was due to the call being called off (3.0%), because the provision of services was deemed inappropriate (2.6%; e.g., further investigation revealed the matter not to be related to any sort of crisis), or because COAST was at capacity (0.7%; i.e., COAST was involved on another call). In contrast, when general patrol officers did not provide services it was because it was not appropriate (18.0%) or the client was not on scene (4.2%).

Comparing General Patrol Before and After COAST Implementation

To test Hypothesis 2(a) and 2(b), a 2 (time period: pre vs post implementation) × 2 (call type: PMI, PIC) analysis of variance (ANOVA) was conducted to examine the impact of COAST implementation and call type on general patrol's total time spent on calls. Originally, we wanted to include time to scene as a covariate, however its inclusion resulted in the violation of the homogeneity of slopes assumption, which must be met in order to include a covariate. In order to still consider the impact of time to scene without violating this assumption, we subtracted time to scene from the total call time and used this as the dependent variable in the analysis. For the purpose of the analysis, call type was grouped into calls involving PMIs and PICs. Given that individuals who are presenting as suicidal are clearly in crisis we included these individuals as PICs. We did not include assisting medical professionals or well-being checks in the analysis because these occurred too infrequently to allow for meaningful comparison. This grouping was used for all subsequent analyses that considered call type.

The assumptions of ANOVA were largely met with the exception of normality and the presence of some outliers. Considering that ANOVA is robust to minor violations of normality given an adequate sample size (Blanca et al. 2017), and that the outliers identified were true values, we proceeded with the analysis. The homogeneity of variances assumption was met as indicated by Levene's test, $F(3, 383) = 0.89$, $p = 0.45$). Additionally, in order to ensure that the analysis was not influenced by the lack of normality or extreme scores we performed a sensitivity analysis with call time square root transformed and the same pattern of results emerged. Therefore, for the purpose of interpretation we report the untransformed results below.

The ANOVA did not reveal any significant main effects of time period or call type, $p > 0.05$. However, there was a significant interaction between the time period and call type, $F(1, 383) = 5.53$, $p = 0.02$, $\eta_p^2 = 0.01$. Probing the interaction revealed that calls involving a PMI took general patrol officers significantly less time after COAST implementation ($M = 97.23$ min, $SD = 79.07$) than before ($M = 128.03$ min, $SD = 98.33$; $p = 0.017$). This decrease in call time has a notable economic impact on the service. Specifically, this equated to a $47.43 reduction per call involving a PMI on average after the implementation of COAST. Taken together, these findings offer some support for Hypothesis 2(a) and 2(b).

Comparing General Patrol and COAST

To examine Hypothesis 3(a), we conducted a 2 (responding unit: patrol versus COAST) × 2 (call type: PMI, PIC)

ANCOVA in order to examine the influence of responding unit and call type on the total time spent on the call after COAST was implemented. Once again, given the large geographical size of the SSPS' jurisdiction, and the fact that COAST was responsible for responding to calls throughout the two districts as opposed to within only one (as is the case for general patrol), it was believed that the time it took to drive to the scene could influence the total call duration for both units, but disproportionately for COAST. Therefore, time to scene was included as a covariate in the analysis. In addition, the current analysis only considered in-progress calls from COAST in order to prevent the very short follow-up call lengths from making their call lengths look artificially lower. COAST completed numerous follow-up calls that consisted of phone calls and home visits to clients they had provided service to previously. Due to a lack of driving to the scene, as well as people not answering, the inclusion of these calls would result in a substantially lower average call time. Given that general patrol officers do not complete follow-ups, their call times would not be similarly influenced. Therefore, to allow for a fair comparison, only in-progress calls were considered.

First, we checked the assumptions, which revealed several violations including non-normality, outliers, and heterogeneity of variances as indicated by Levene's test, $F(3, 232) = 4.92$, $p = 0.002$. We conducted a sensitivity analysis using the square root transformed total duration and time to scene and the results did not change. Therefore, the analysis proceeded with the untransformed variables and HC3 robust standard errors in order to address the potential influence of heteroscedasticity on significance testing (i.e., erroneous results; Hayes and Cai 2007; Mackinon and White 1985). Results revealed no significant main effects of time to scene or call type, nor were there any significant interactions, $p > 0.05$. However, there was a significant main effect of responding unit in that COAST spent on average less time on calls ($M = 87.49$, $SE = 14.37$) than general patrol ($M = 116.21$, $SE = 6.06$), $b = -48.82$, $SE = 13.20$, $p < 0.001$. All means reported are covariate adjusted. Therefore, there was support for Hypothesis 3(a).

In order to test Hypothesis 3(b), which related to the economic impact of the implementation of COAST on the SSPS, we conducted a 2 (responding unit: general patrol vs. COAST) × 2 (call type: PMI, PIC) ANCOVA in order to examine the influence of responding unit and call type on the total call cost after COAST was implemented.[4] Once again, time to scene was used as a covariate and only in-progress calls from after the implementation of COAST were included for both general patrol and COAST.

Checking the assumptions revealed several violations including non-normality, outliers, and heterogeneity of variances as indicated by Levene's test, $F(3, 232) = 16.07$, $p < 0.001$. Once again, we conducted a sensitivity analysis and as a consequence of the same pattern of results emerging we are reporting the untransformed results with a HC3 correction for the standard errors. The results did not reveal any significant main effects of call type or time to scene, nor were there any significant interactions, $p > 0.05$. However, there was a significant main effect of responding unit, indicating that calls where COAST responded cost the service less on average ($M = 68.08$ dollars, $SE = 20.96$) than general patrol ($M = 178.89$ dollars, $SE = 8.84$; $b = -130.05$, $SE = 16.52$, $p < 0.001$). Again, all means reported are covariate adjusted. Therefore, there was support for Hypothesis 3(b).

Time Spent in the Emergency Department

Unfortunately, the influence of time spent in the ED could not be statistically examined (Hypothesis 4) because COAST dispositions result in transport to the hospital so infrequently (i.e., the sample size was inadequate for comparison purposes). However, when COAST apprehended individuals ($n = 6$) the average amount of time spent in the ED ($M = 56.5$ min, $SD = 24.1$) was approximately half that of general patrol ($n = 56$; $M = 107.0$ min, $SD = 42.5$). While the sample size is small, less time spent in the ED has significant implications for hospitals, officers, and potentially service users themselves in terms of time and resources. For example, the substantially lower mean time spent by COAST has financial implications for the service. To put this into perspective, the 50.5-min decrease in time spent in the ED described above would correspond to a cost savings of $77.77 to the police service alone. Therefore, the combination of apprehending individuals less frequently and the substantially less time spent in EDs when individuals are apprehended likely has meaningful financial implications for the service over time.

Discussion

The present study represents a preliminary evaluation of a COAST in a small Canadian police service. The goal was to examine the impact of COAST on the service in terms of the disposition for clients (i.e., resources provided, apprehension), the amount of time spent on calls, time spent in the ED, and whether the initiative resulted in cost savings to the police service. Overall, the evaluation revealed that some positive initial benefits are associated with the initiative, which are somewhat consistent with the previous literature on MCITs.

[4] Unlike the analysis of costs reported above, an ANCOVA was required for this analysis because general patrol costs twice as much as COAST per minute. Therefore, we cannot infer whether the difference is significant based off of the significance test examining time (as was the case when comparing patrol before and after implementation).

Several analyses were undertaken to examine the potential benefits of COAST initiative. Firstly, we examined the distributions of crisis-related calls and found a steady amount throughout the week with an influx during the later hours of the day. Interestingly, it appeared that Thursdays had substantially more calls than other days of the week. This marks an unexplained finding as COAST responded as a team on these days (therefore this cannot be explained by only one individual responding as opposed to two) and there is no other indication that Thursdays are somehow unique. It would appear that the volume of calls during COAST shifts, as well as outside of their working hours, justifies an extension of current COAST operation times in order to better meet the needs of the community. However, any changes would require further staffing, as the program currently operates with only one police officer and one of two crisis workers. Lack of adequate staffing has been demonstrated to hinder the response of MCITs through lengthening their response times (Steadman et al. 2000).

It appears that the implementation of COAST may have benefits for the entire service as seen through the exploratory analysis examining whether there were differences in general patrol's call disposition before and after COAST implementation. Specifically, after COAST implementation, general patrol officers provided more resources to clients and apprehended individuals less frequently than before. These are potentially very important findings. The literature supports that officers' knowledge of community resources can influence call disposition (Lamb et al. 2002). Further, more positive service outcomes have been associated with providing appropriate resources and diverting individuals from the ED (Steadman et al. 2000). In turn, this may contribute to clients receiving better service, increasing the likelihood they will receive the help they need through being in contact with appropriate community resources. While no formal training to patrol officers occurred during the study period that would account for these findings, the size of the SSPS allows for substantial dissemination of knowledge and information between COAST and general patrol, which may partially explain the differences. For example, COAST is easily accessible to front line officers even when not engaged in an operational call for service. Officers have the freedom to seek advice and resources from COAST after a call has ended or prior to attending.

The increased awareness exhibited by general patrol officers towards mental health issues may have also been a consequence of the presence of COAST itself, in that the program may make patrol officers more aware of how calls are resolved. A major goal of COAST is to provide clients with appropriate community resources to prevent trips to the hospital when possible, as well as hospital admissions. This is clearly happening in South Simcoe; for example, in support of Hypothesis 1, COAST referred clients to community resources at a high rate (1a) and apprehended clients at a relatively low rate (1b). COAST additionally provided resources to the vast majority of clients they interacted with during follow-ups, which likely assists these individuals in finding the appropriate help they need over the longer-term and reduces the likelihood of requesting police assistance in the future when it is not required. In other words, the COAST initiative may allow for better outcomes for individuals, as well as reduce some of the strain on police resources. Relatedly, the appropriate use of community resources is likely to reduce call times; this is particularly true when taking into account the considerable time officers may spend in the ED (Clarke et al. 2007; PHSJCC 2011). This reduction in call time, especially within the ED, will expand the ability for MCITs such as COAST to respond to crisis-related calls. This is incredibly important given what we know about this issue. For example, Durbin, Lin, and Zaslavska (2010) found that MCITs in Ontario only responded to 25% of crisis incidents.

In contrast to the support found for Hypothesis 1, the results of the present study revealed mixed findings for Hypothesis 2, which examined whether the time general patrol spent on calls, on average, would be reduced after COAST implementation (2a), which would be associated with a reduced cost to the service (2b). Our results suggest that overall, there were no significant reductions in call time for general patrol following COAST implementation (2a). However, there was a significant interaction such that after COAST implementation, calls involving PMIs took patrol officers less time to resolve than before implementation, therefore only partially supporting our hypothesis. Relatedly, within general patrol responses to crisis-related calls there was not a significant overall reduction in cost following the COAST implementation (2b). The exception to this were calls involving PMIs in which the service saved nearly $50 on average for every patrol response to a call involving a PMI as compared to before COAST was implemented.

The comparison of general patrol officers to COAST (after COAST implementation) provided support for Hypothesis 3a in that COAST responses were associated with significantly shorter call times on average than general patrol. As previously mentioned, compared to general patrol officers, COAST apprehended individuals less often, and spent less time on average in the hospital when they did have to use that disposition. This reduced call time is consistent with previous literature (Kisely et al. 2010) and may be due to various factors. One explanation could be that COAST communicates more effectively with clients, due to having a better understanding of their current situation; this could result in situations being more effectively de-escalated and consequently more quickly resolved.

Similar to the support for Hypothesis 3a, the implementation of COAST appears to result in cost savings to the

organization, which supports Hypothesis 3b. Specifically, COAST responding to calls was associated with a lower cost on average compared to general patrol. Given the finding that there is an increased cost when general patrol officers respond to crisis-related calls, this means that had general patrol responded to the 76 in-progress calls that COAST dealt with over the 6-month post-implementation period, there would be a substantial increased cost to the service. This cost savings is quite substantial, especially considering the other benefits associated with COAST (as described above) and may justify the expansion of the COAST initiative in terms of service times and staffing. The reduction in cost also suggests there is less strain on police resources in responding to crisis-related calls, which the literature has indicated is a problem police services face across the entire country (PHSJCC 2011).

Finally, although Hypothesis 4 could not be examined, the significantly lower rate of apprehensions by COAST does indicate that officers on this team spend less time in EDs. This may be a consequence of being better able to identify who truly needs to go to the hospital, being better able to communicate with hospital personnel when visits to the ED do occur, and/or being better able to develop relationships with hospital personnel so that these individuals trust the judgment of COAST members. All of these potential explanations should be examined through future research that involves interviews with clients themselves, as well as hospital personnel. Additionally, given that the literature suggests that ED time significantly contributes to overall call length, the reduction in apprehensions by COAST (and general patrol after COAST implementation) would likely decrease the amount of time spent on the call due to the reduction in ED visits. So long as these diversions from apprehension are appropriate, these reductions in apprehensions and call times will have positive implications in terms of cost for the service and the public health system more generally. Finally, and perhaps most importantly, providing appropriate community resources instead of apprehending someone and taking them to the hospital is likely highly beneficial to the individual service user as well.

Limitations and Future Directions

The current study had limitations that should be considered. As with a lot of operational police data, the standardized reporting forms that were completed were not always entirely complete, resulting in some data being excluded from the analyses. However, this did not happen frequently, the data was not systematically missing, and the sample that the analysis was based on was still sufficiently large. Therefore, missing data is likely not problematic in the current study. In addition, there is always the possibility for recording bias when data is collected in this way as the completion of the standardized reporting forms relies on a subjective interpretation of an event. For example, officers with less knowledge about mental illness may describe individuals in a way that identifies them as suffering from a mental illness, when in fact they may be experiencing a temporary, situational crisis. Therefore, individual officer differences in terms of their understanding and perception of clients may have potentially influenced the way they completed their report, as well as subsequent completion of the form by the COAST officer. Finally, only one form was completed for each interaction and therefore we were unable to capture if general patrol had to wait with an individual for COAST. In these cases, patrol may be doing a lot of the "leg work" in dealing with the call, with COAST benefiting from a shorter call time. Future research should attempt to address these types of issues.

Additionally, a control site was not used, which prevented us from discerning whether pre-post implementation differences were due solely to the introduction of the COAST program or other initiatives (or naturally occurring phenomena) that were potentially exerting an influence in the region during the course of the study. Furthermore, the findings of the present study may not generalize to other jurisdictions due to the characteristics of the current site (e.g., the population served, its rural and suburban nature, the type and quantity of community-based mental health and other support services available).

As previously mentioned, the present study was also not able to account for other outcomes of interest, such as use-of-force or arrests rates, due to the infrequency of these outcomes within this region. Relatedly, we were unable to consider the influence of ED time in the present study due to a small sample size. Future research should attempt to examine the circumstances under which individuals are taken to the hospital and the appropriateness of this decision. Additionally, future research should examine whether there are differences when the officer responds alone as part of COAST or the officer responds with a CRW as the differing dynamics may influence the interaction (e.g., because there are two people instead of one, the presence of the CRW). Finally, the opinions of various stakeholders (e.g., service users, hospital personnel, general patrol officers, members of the community, COAST members) about the pros and cons of the COAST initiative were not considered. Such data would allow for a more comprehensive understanding of COAST's impact on the SSPS, the participating mental health agencies, and perhaps most importantly, on members of the public, especially people in crisis. This research is currently being conducted.

Conclusion

The current study provides evidence that the implementation of a COAST program in the SSPS may be beneficial. The implementation of COAST was associated with more resources being provided to clients, fewer apprehensions, and decreased financial costs for the police. Additionally, the COAST was able to resolve calls for service more quickly on average than patrol officers, which resulted in cost savings to the service. The evidence emerging from our analyses further suggests that the COAST program may improve outcomes for clients through increased awareness and use of community mental health resources, as opposed to hospital resources. Considering these initial positive outcomes, expanding the program's working hours and staff may be beneficial. Future research should evaluate any expansion of this initiative, as well as consider the perspectives of all stakeholders (i.e., people in crisis, general patrol officers, COAST officer, mental health professionals) to determine the factors contributing to the positive outcomes.

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Compliance with Ethical Standards

Conflict of interest The second author is the officer on the Crisis Outreach and Support Team and therefore employed by the South Simcoe Police Service. None of the other authors have any conflicts of interest to disclose.

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