A Systematic Review of Law Enforcement Training Related to Autism Spectrum Disorder

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Abstract

Although research confirms the effectiveness of training to improve law enforcement officers' (LEOs) awareness and knowledge of people with intellectual disability and learning disabilities, review of the efficacy of autism-specific law enforcement training is needed. To provide up-to-date information regarding training for LEOs related to autism spectrum disorder (ASD), a systematic review of the literature was conducted. Adhering to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses for Protocols (PRISMA), we conducted a search of 13 professional databases and 28 journals using search terms related to both ASD and law enforcement training. From 606 articles identified during the initial search, only two articles met inclusion criteria, which suggests that limited research exists that explores ASD and law enforcement training. Included studies were summarized in terms of participants as well as training format, content, and outcomes. Limitations of the current literature, directions for future research, and current implications for practice are discussed.

Keywords

autism spectrum disorder, intervention, personnel preparation

Beginning with the establishment of the Community Oriented Policing Services (COPS) model within the United States Department of Justice in 1994, law enforcement has placed greater emphasis on prevention, collaborative partnerships, and problem-solving (Bureau of Justice Assistance, 1994). Importantly, the COPS model encourages law enforcement officers (LEOs) to build relationships with all people in their communities, especially those who may differ physically, intellectually, emotionally, and socially from individuals without disabilities or mental health concerns (Price, 2005). In everyday interactions, LEOs routinely encounter people with a range of disabilities. In fact, one study found that 7% of all police contacts involve people with mental health needs (Deane et al., 1999). In addition, individuals with developmental disabilities are seven times more likely to interact with LEOs when compared to other citizens without disabilities (Curry et al., 1993; Organization for Autism Research, 2014). Given increased contact with persons with disabilities, LEOs are also more likely to interact with family members/caregivers, medical and psychiatric facilities, and outreach programs/non-profit organizations who support individuals with disabilities.

LEOs' Interactions With Individuals With Autism Spectrum Disorder

Although it is possible to address some of the characteristics of autism spectrum disorder (ASD) through generalized training on mental health or intellectual disability (ID), tailored trainings should address the unique challenges associated with ASD specifically. Rava et al. (2017) found that roughly 20% of individuals with ASD reported either being stopped or questioned by police at least once by the time they were in their mid-twenties. Although the prevalence of ASD involvement in the criminal justice system (CJS) is currently unknown (King & Murphy, 2014), research suggests that individuals with ASD are involved in interactions with LEOs as victims (Mayes, 2003) and suspects (Woodbury-Smith & Dein, 2014). In addition, researchers suggest that individuals with ASD who frequently exhibit unusual behaviors (e.g., hand flapping, pacing, self-harming) or elopement have higher chances of encountering LEOs and being arrested (Debbaudt & Rothman, 2001).

Many behaviors displayed by individuals with ASD can be misinterpreted by LEOs as challenging or disrespectful (Debbaudt & Rothman, 2001). Misinterpretations may contribute to the rising number of incidents involving individuals with disabilities and the CJS (Rava et al., 2017). For

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example, individuals with ASD may experience sensory issues (e.g., aversion to police lights and noises, aversion to being handcuffed) and difficulties communicating effectively to LEOs' questioning. Unfortunately, several encounters between LEOs and individuals with ASD have ended in negative outcomes such as arrest or death (Copenhaver & Tewksbury, 2019). Although it can be difficult for LEOs to quickly and accurately assess situations and take measures to protect themselves and others, the negative outcomes of these encounters highlight a need for LEOs to receive more ASD-specific training.

Gardner et al. (2019) found that 72.2% of LEOs reported no training for working with individuals with ASD. LEOs who had received training reported feeling better prepared to respond to calls involving individuals with ASD; however, outcomes (e.g., use of handcuffs) did not differ whether LEOs received training or not. Crane and colleagues (2016) found that LEOs identified time constraints and lack of training as barriers to providing adequate support to individuals with ASD in their roles as officers. Despite reporting that "understanding ASD" was one of the top two easiest aspects of policing related to ASD, only 48% of LEOs indicated that they felt well-equipped to serve individuals with ASD and 42% reported satisfaction in their dealings with the ASD community (Crane et al., 2016). Of concern, only 13% of caregivers of individuals with ASD reported "satisfactory" interactions between LEOs and their children with ASD. Moreover, only 15% of adults with ASD reported a "satisfactory" experience when describing interactions (Crane et al., 2016).

LEOs' Knowledge and Attitudes Toward Individuals With ASD

Despite known interactions between LEOs and persons with ASD, research suggests that LEOs are often not knowledgeable about ASD and report concerns about appropriately handling situations involving persons with ASD (Chown, 2009; Crane et al., 2016). To identify characteristics of ASD, it is essential that LEOs become aware of the range of behavior individuals with ASD may present. Modell and Mak (2008) surveyed 124 police officers in the United States and found that 80% were unable to identify defining features of ASD; 35% of the sample reported simply associating ASD with the film "Rain Man." A survey of LEOs in the United Kingdom found that officers rated their competence levels in providing support to individuals with ASD with an average of 2.63 (1 being least competent and 5 being most competent; Chown, 2009).

The lack of appropriate support to individuals with ASD by LEOs could potentially lead to emotional stress, breakdowns in communication abilities, and behavioral regulation difficulties. However, misinterpretation of behaviors during high-stress or tense situations can be improved with proper training, education, and through increasing interactions with persons with ASD in commonplace settings (Chown, 2009). In addition to simply interacting more frequently with individuals with disabilities, LEOs would benefit from increasing their knowledge regarding signs of mental illness and specific disabilities, appropriate interaction strategies and interventions, as well as the broader social systems which frame these interactions between LEOs and people with disabilities.

Training of LEOs Regarding Persons With ASD

As reviewed above, a lack of understanding of and training geared toward ASD is likely to result in inadequate support of individuals with ASD within law enforcement encounters. Given the various reports of negative interactions between LEOs and persons with ASD (Copenhaver & Tewksbury, 2019), formal training on how to recognize and respond to the needs of community members with ASD is needed. To this end, researchers have also called for specialized training in ASD to be developed after reviewing law enforcement training curriculum from seven states in the United States (Laan et al., 2013). Laan et al. (2013) suggest that training should focus on how to recognize signs of ASD and various techniques LEOs can use to support persons with ASD, especially effective communication tactics and strategies to manage crisis situations. However, the authors did not provide information regarding specific information to include and mechanisms to use when presenting trainings (Laan et al., 2013).

LEOs report that training may help them better manage emotional and behavioral reactions, sensory sensitivities, and communication needs of individuals with ASD (Crane et al., 2016). However, one study found that only 37% of LEOs had received training on ASD specifically, and over 25% of officers report dissatisfaction with training (Crane et al., 2016). In New Jersey, where the state mandated that all first responders receive ASD-specific training beginning in 2008, Kelly and Hassett-Walker (2016) found that a significant percentage of emergency personnel had not completed the mandatory training as of Fall 2014. New Jersey mandated that officers hired pre-2008 receive ASD training by 2011, and findings show that many pre-2008 LEOs had not accessed this training. Therefore, results of this study suggest that ASD-related training for first responders may be limited even when mandated by a state.

Purpose of the Review

A review of existing research suggests that law enforcement training on ASD appears limited; however, a comprehensive, systematic review of the current literature is needed to describe the state of research regarding ASD training for

LEOs. Although research confirms the effectiveness of training to improve LEOs' awareness and knowledge of people with ID (Bailey et al., 2001) and learning disabilities (McAllister et al., 2002), a review of the efficacy of autism-specific law enforcement trainings is needed. Thus, the purpose of the review is to provide up-to-date information regarding experimental/intervention-based studies that focus on LEO training to support individuals with ASD. The current systematic review has four purposes: (a) review content of autism-specific trainings for LEOs, (b) explore all outcomes of identified trainings, (c) highlight gaps in the current research body, and (d) provide implications for future practice and research.

Method

This study followed the five steps of systematic reviews proposed by Kahn et al. (2003), which are outlined below.

Framing Questions

In the *first step*, questions to be addressed in the review should be framed clearly and include specific outcomes. For this study, researchers sought to review and describe all studies that employed experimental designs to evaluate LEO training related to ASD.

Identifying Relevant Literature

In the *second step*, Kahn and colleagues (2003) suggest that researchers should set a priori study selection criteria that directly relate to the research questions. Prior to conducting the search, the first author developed a protocol adhering to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses for Protocols 2015 (PRISMA-P 2015; Moher et al., 2015). The protocol presented an explicit plan for the systematic review based on predefined eligibility criteria and a specific methodological and analytic approach. To identify a comprehensive list of published literature on LEO training and ASD, the first author performed a search of professional databases using the following keywords as search terms: (a) *autism* keywords: autis*, ASD, pervasive developmental disorder, Asperger, high functioning autism; (b) *officer* keywords: police officer, policing, law enforcement, sheriff, first responder; and (c) *training* keywords: training, professional development, education, professional training.

Search terms were combined (terms within groups combined with "OR," terms across groups combined with "AND"). The specified keywords and search process were identified via: (a) review of search terms in relevant published articles; (b) consultation with librarians from the three university-level librarians who specialize in public health, criminal justice, and education; (c) consultation with

a professor/researcher who specializes in ASD and has published systematic reviews; and (d) review of terminology used in organizations related to law enforcement and ASD.

The initial search was undertaken in March 2018, and a hand search of most recent issue of journals and review of citations was conducted in June 2018. No date restrictions were placed on the search, and studies were identified through a variety of methods. First, 13 databases related to criminal justice, social sciences, and education were searched using the keywords identified above. Second, the first author conducted a hand search of 28 journals related to ASD and the CJS. See Table 1 for a comprehensive list of databases and journals. Next, the first author conducted a search of the references in identified articles before completing a citation search of relevant articles to identify any additional articles.

Study eligibility. The "PICO" method, which defines the population, intervention, appropriate control or comparator, and outcomes of interest, was utilized when formulating the questions for the review (Moher et al., 2015). The process of clearly describing the inclusion criteria for each of the PICO elements guided the determination of study eligibility, data extraction, analysis, and interpretation of results. Articles were included if: (a) LEOs at any level of training were participants; (b) a training program focused on any topic related to ASD; (c) any type of training-related outcome was explored; (d) an experimental design (e.g., quantitative, qualitative, mixed-method) was utilized to analyze effects of training; (e) they were published in a peer-reviewed journal; and (f) they were published in English. Articles were included irrespective of the presence or absence of comparator or control groups, and no data restriction was placed on the search.

Articles were excluded for the following reasons: (a) only descriptive information provided (e.g., review articles) and did not include an autism-specific intervention component; (b) not peer-reviewed (e.g., dissertations, newspaper articles, blog articles, policy briefs, editorials); and/or (c) the intervention focused on disabilities (e.g., ID, learning disabilities, mental illnesses) and did not include information about ASD.

Study selection. The study selection process is presented in a PRISMA flow diagram (see Figure 1). First, two researchers (K.S.R. and A.M.A.L.) screened all title and abstracts independently to determine relevance for the review. Specifically, each author reviewed the information in the title and abstract that related to population, absence/presence of an intervention, appropriate control or comparator (if applicable), and outcomes of the study. Then, authors made independent decisions whether the article met inclusion criteria and did not meet exclusion criteria. The full-text papers of the remaining articles were further examined, and reviewers

Table 1. Journal and Databases Utilized in Search.

Databases (n = 13)	Journals (n = 28)
Academic Search Complete	*Autism*
Criminal Justice Abstracts	*Autism Research*
Criminal Justice Database	*Crime & Delinquency*
Cumulative Index to Nursing and Allied Health Literature	*Criminal Justice and Behaviour*
Education Resources Information Center	*Criminal Justice Ethics*
International Security and Counterterrorism Reference Center	*Criminal Justice Policy Review*
National Criminal Justice Reference Service Abstracts	*Criminology*
Nursing and Allied Health	*Criminology & Criminal Justice: An International Journal*
Psychology and Behavioral Sciences Collection	*Focus on Autism and Developmental Disorders*
PsycINFO	*Intellectual and Developmental Disabilities*
Scopus	*International Journal of Police Science & Management*
Social Science Database	*Journal of Autism and Developmental Disorders*
Web of Science Core Collection	*Journal of Contemporary Criminal Justice*
	Journal of Correctional Education
	Journal of Crime and Justice
	Journal of Criminal Justice
	Journal of Criminal Justice Education
	Journal of Global Intelligence & Policy
	Journal of Intellectual Disabilities and Offending Behaviour
	Journal of Intellectual Disability Research
	Journal of Police and Criminal Psychology
	Justice Quarterly
	Police Quarterly
	Policing & Society
	Psychology, Crime, & Law
	Psychology, Psychiatry, & Law
	Research in Autism Spectrum Disorders
	The Police Journal: Theory, Practice, and Principles

made study inclusion decisions per inclusion and exclusion criteria set a priori. While screening and reviewing citations of relevant studies, additional articles that met criteria were added to the finalized list. While completing a citation search of relevant articles, and more specifically while searching for publications that cited work done by Crane et al. (2016), the first author (K.S.R.) identified a relevant article by Murphy et al. (2017).

Assessing the Quality of Studies

In the *third step* of Kahn and colleagues' (2003) process, researchers should assess the quality of the studies using a critical appraisal guide and design-based quality checklists. Later, results of the quality appraisal indicators help describe strengths and weaknesses of studies as well as make recommendations for future research. In this study, researchers utilized the McMaster Quantitative Critical Appraisal Tool (Law et al., 1998) to appraise the identified studies. First, reviewers independently assigned a score on

each of the 15 domains (1 = *Yes*, 0 = *No or not addressed*). Authors adhered to guidelines set by Law et al. (1998) when making decisions regarding which score to assign. Then, agreement between both reviewers' scores was calculated and common methodological issues were noted.

Summarizing the Evidence

In the *fourth step*, Kahn and colleagues (2003) note that data from identified studies should be synthesized, and study characteristics should be tabulated into a pre-established protocol. In this study, data from identified studies were extracted independently by each of the reviewers and recorded on the pre-established data extraction protocol. The following information was summarized from each study: (a) publication demographics; (b) participant information; (c) summary of intervention; (d) details of control conditions, if present; and (e) description of study outcomes as well as overview of limitations and future directions.
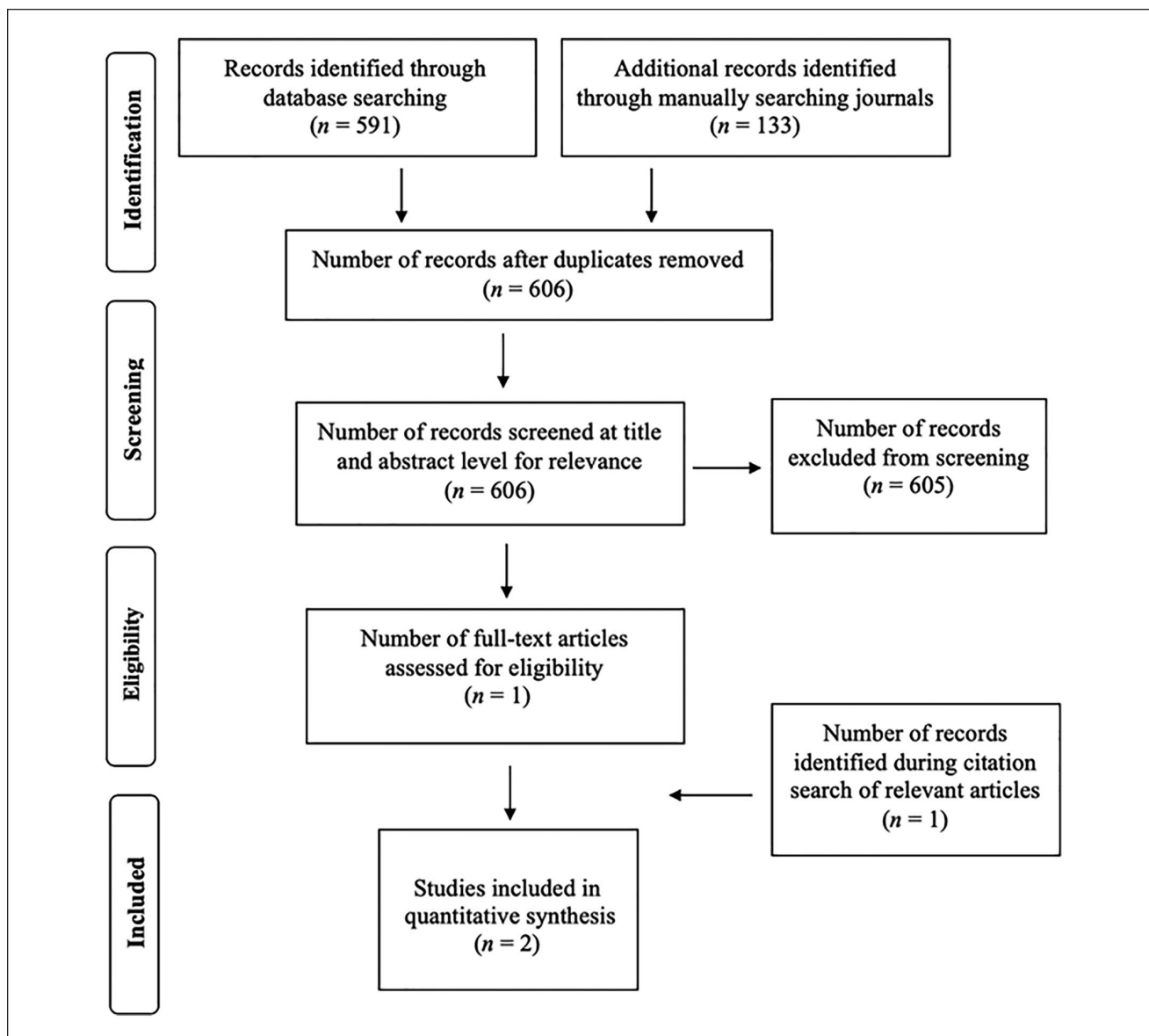
Figure 1. PRISMA flow diagram of the study selection process.
Note. PRISMA = Preferred Reporting Items for Systematic Reviews and Meta-Analyses.

Interpreting the Findings

Finally, in the *fifth step* of Kahn and colleagues' (2003) process, the findings of the review should be discussed, and the quality of studies should be reviewed. For this study, researchers interpret the findings and review quality of the studies in the sections below.

Results

Initially, 724 articles were identified, though 606 remained after de-duplication. We removed duplicate articles reliably using the Rayyan® (Ouzzani et al., 2016) software. Only

one article remained after two researchers independently screened articles at the title and abstract level to ensure the study focused on ASD-specific interventions for LEOs (Teagardin et al., 2012), and one article was later identified when completing citation searches of relevant articles (Murphy et al., 2017). Thus, only two articles (Murphy et al., 2017; Teagardin et al., 2012) were included in the final quantitative synthesis. Throughout the article, the Murphy et al. (2017) article will be referred to as Study 1, and the Teagardin et al. (2012) article will be referred to as Study 2. See the PRISMA diagram in Figure 1 for an overview of the screening process. Researchers did not tally specific reasons for exclusion of studies; however, most

Table 2. Quality Scores for Critical Appraisal of Included Studies.

	Included studies	
Criterion	Murphy et al. (2017)	Teagardin et al. (2012)
1. Was the purpose clearly stated?	0	1
2. Was relevant background literature reviewed?	1	1
3. Was the study design described?	1	1
4a. Was sample described in detail?	0	0
4b. Was the sample size justified?	0	0
5a. Were the outcome measures reliable?	0	0
5b. Were the outcome measures valid?	0	0
6a. Was the intervention described in detail?	0	0
6b. Was contamination avoided?	0	0
6c. Was co-intervention avoided?	0	0
7a. Results were reported in terms of statistical methods?	1	1
7b. Were the analysis method(s) appropriate?	1	1
7c. Was clinical importance reported?	0	0
7d. Were dropouts reported?	0	1
8. Conclusions were adequate given the study methods and results?	1	1
Total score (/15)	5 (33.3%)	7 (46.7%)

Note. The key to scoring follows: 1 = *Yes*; 2 = *No or not addressed*. A maximum score of 15 could be allotted.

screened articles were excluded because the articles examined the interface of the CJS and other disorders, were not empirical studies, and/or did not evaluate LEO training specific to ASD.

Reliability During Study Selection Process

During the study selection process, two researchers independently screened articles. Inter-rater reliability was calculated in the following two ways to examine agreement between authors: (a) percentage of agreement and (b) *kappa*. In both the title/abstract screening and the full-text review phases, percentage of agreement between researchers was 100% and *kappa* was 1.0. After identifying the Murphy et al. (2017) article, two researchers (K.S.R. and J.M.C.) reviewed the full-text article and agreed that that the study met inclusion criteria.

Critical Appraisal for Bias of Included Studies

Two raters independently completed the McMaster Quantitative Critical Appraisal Tool (Law et al., 1998) while reviewing each of the two included studies. Each reviewer assigned a score of either 1 or 0 (1 = *Yes*; 0 = *No or not addressed*) for all 15 domains. See Table 2 for total score and summary of each article. There was 100% agreement between the scores of the two reviewers (K.S.R. and A.M.A.L.) for both articles. Common methodological problems for both studies were related to inadequate description and justification of sample size, limited psychometric description of outcome measures, limited description of

intervention, and insufficient reporting about the avoidance of contamination and co-intervention.

Study Demographic Information

Both studies were conducted within the last decade in Ireland (Study 1) and the United States (Study 2; see Table 3). Study 1 employed a quasi-experimental pretest–posttest design without a control group while Study 2 conducted an experimental randomized, waitlist-controlled design. Additional information regarding data on the PICO constructs is provided.

Population. Both studies were similar in terms of participant recruitment. Specifically, participants were recruited from relatively homogeneous groups of police officers. All participants in Study 1 were police officers working for Ireland's National Police Service while a variety of law enforcement personnel from patrol officers to detectives were included in Study 2. Participant demographics were not described in detail for either study, and background information such as age or ethnicity was not provided. To participate in Study 2, individuals were excluded from the study if they had a family member or close relative with ASD. The sample sizes of both studies were small, ranging from 11 (Study 1) to 82 (Study 2) participants.

Intervention. In Study 1, a 90-min ASD awareness training was conducted by a consultant psychiatrist with experience in diagnosis and treatment of ASD through the Continuous Professional development unit in the county headquarters

Table 3. Summary of Main Findings.

Characteristic	Study 1 Murphy et al. (2017)	Study 2 Teagardin et al. (2012)
Country	Ireland	United States
Study design	Quasi-experimental; pretest–posttest design	Experimental; Randomized, waitlist-controlled design
Training aims	Evaluation of a 90-min training on autism awareness delivered by psychiatrist	Evaluation of 13-min training video titled "Law Enforcement: Your Piece to the Autism Puzzle," by the Sahara Cares Foundation in 2008
Target group	Police officers in An Garda Síochána, Ireland's National Police Service	"In the field" officers, including patrol officers and detectives, from Ventura County Law Enforcement Department who spoke English without family member or close relative with ASD.
Training format	Not provided. Requested in October 2018	The training consisted of educational video about ASD. The following topics are covered: definition and key characteristics of ASD, how to identify individuals with ASD, and how to appropriately support people with ASD
Group size	11 officers; no control group	42 LEOs in training; 40 LEOs in control; cohorts randomly assigned
Training duration	90-min in-person training	13-min video training
Training content	Not provided. Requested in October 2018	Video begins with a caregiver searching for her son with ASD. A detective who is the Crisis Intervention Training Program Director in Utah then discussed symptoms of ASD as well as strategies to respond to people with ASD. Video presents facts about ASD, including the prevalence rate, and includes three LEOs whose sons have ASD
Training evaluation	Pretest and posttest survey with five items using Likert scales on a scale of 1 to 10 (1 = *no*; 10 = *yes*) administered immediately before and after training	Pretest and posttest surveys utilized. A 12-item questionnaire: 10 knowledge questions and two questions to assess participants' level of confidence interacting with people with ASD
Training outcomes	Self-reported understanding of ASD improved significantly between pretest ($M = 4.9$) and posttest ($M = 7.9$). Officers' awareness of difficulties experienced by people with ASD significantly improved between pretest ($M = 4.7$) and posttest ($M = 8.3$). Self-reported confidence around use of effective communication strategies improved significantly between pretest ($M = 4.7$) and posttest ($M = 8.3$). Self-reported confidence on approaching individuals experiencing a "meltdown" improved significantly from pretest ($M = 4.0$) to posttest ($M = 8.8$)	Significant improvements in knowledge of ASD based on changes in pretest ($M = 29\%$) to posttest ($M = 53\%$) for the training group For control group, scores on the outcome measure only improved between the second pretest ($M = 19\%$) to the posttest ($M = 47\%$) Self-reported confidence in identifying people with ASD improved after the training ($t = 4.28$, $p < .001$). Self-reported confidence in interacting with people with ASD improved ($t = 2.48$, $p = .15$)*
Constructs measured	Self-reported understanding of ASD and confidence	Self-reported knowledge of ASD and confidence in identifying and interacting with people with ASD
Limitations	Small sample size; lack of demographic information provided; limited description of training format or content; no control group; limited description of evaluation instruments; lack of behavioral outcome measure (only self-report)	Only one law enforcement department included; participant information not provided; no analysis of behavioral outcomes; lack of standardization of outcome measure and no discussion of how 10 knowledge items were created
Suggestions for future training	None provided	Video training alone may not be sufficient. Training length should be increased beyond 13 min. Authors suggest practical implementation of trainings should be considered

Note. ASD = autism spectrum disorder.
*Authors report a *p*-value of .15 and interpret this as significant.

of the An Garda Síochána in Cork, Ireland. Information regarding the content and format of the training were requested from the authors but were not available upon publication of this manuscript. In Study 2, the intervention consisted of a 13-min educational video about ASD created by the Sahara Cares Foundation. The video reviews the definition of key characteristics of ASD as well as provides a general overview regarding how to identify and support individuals with ASD.

Comparator/control. Study 1 did not include a control group. Study 2 included a control group and treatment group. Due to practical limitations, random assignment occurred at the cohort level such that all participants who signed up to attend a training on the same day were treated as a single cohort. Participant cohorts were then randomly assigned to either the control ($n = 40$) or treatment group ($n = 42$). Participants in the control group received the training shortly after the treatment group.

Outcome measures. Both studies evaluated the effect of ASD-specific trainings on knowledge of ASD and confidence in identifying and supporting individuals with ASD. In both studies, training evaluation measures were developed by the researchers. Study 1 used five self-report items, using a scale with 10 points of agreement, that were collected twice via pretest and posttest surveys. Participants answered five questions designed to measure awareness of ASD and confidence in approaching individuals experiencing a "meltdown" and utilizing communication strategies with individuals with ASD. One item measured perceived helpfulness of the training. Psychometric information was not provided, and the items were examined independently rather than as one complete measure. In Study 2, researchers developed a 12-item measure with 10 questions related to knowledge of persons with ASD and two questions related to level of confidence in identifying and interacting with persons with ASD. The 10 knowledge items were examined together as a mean percentage correct score for both the pretest and posttest, and the two questions related to self-reported confidence were assessed independently using dependent samples *t*-tests to compare pretest and posttest ratings.

Main Findings

Table 3 provides a summary of the included studies in terms of (a) country, (b) study design, (c) target group, (d) training format, (e) group size, (f) training duration, (g) training content, (h) training evaluation, (i) training outcomes, (j) constructs measured, (k) limitations, and (l) suggestions for future training. The studies reported statistically significant improvements in participants' self-reported awareness of ASD and confidence in supporting individuals with ASD

(Study 1) as well as knowledge of ASD and confidence in identifying and interacting with people with ASD (Study 2).

Discussion

To provide up-to-date information regarding ASD-specific training for LEOs, the first author conducted a search of 13 databases and 28 journals that cover topics related to criminal justice, psychology, public health, and education. Two researchers independently reviewed articles during all steps of the screening process to determine article eligibility based on inclusion and exclusion criteria set a priori. Despite a thorough literature review, the first author identified only two studies that evaluated ASD-specific training for LEOs. Main findings of the review, limitations, and recommendations for future research are outlined below.

Summary and Implications of Main Findings

Overall, one of the major findings of the review is the scarcity of research concerning ASD-specific trainings for LEOs. Only two articles describing 93 participants and two different interventions met the inclusion criteria, which were purposefully broad to capture as many studies as possible. Even though no date restrictions were placed on the search, both studies were published within the last decade. Specifically, Teagardin and colleagues (2012) published the first intervention study in the United States whereas Murphy and Peers (2017) conducted a more recent study in Ireland. The present findings suggest that ASD-specific interventions have potential benefits; however, it is difficult to evaluate effectiveness given limitations of both studies.

A second finding of this review involves the exploration of research methodologies found in the literature on ASD-specific training for LEOs. Out of the two identified articles, only one study (Teagardin et al., 2012) utilized a randomized, waitlist-controlled design and included a control group; however, randomization occurred at a cohort level, as officers in attendance on a particular day were treated as a single cohort. Murphy and colleagues (2017) utilized a cross-sectional, pretest–posttest design and included only 11 LEOs from the same cohort. A major limitation of both studies involves the inclusion of a small sample with participants who may be biased in their responses. For example, it is important to note how participants were selected, whether the sample was representative of the larger departments, and prior experiences of LEOs who participated. Not only do both studies include small sample sizes, but little information is provided about participant demographics and selection, which raises concerns about participant self-selection bias given that participants may have chosen to participate due to a strong interest in ASD (Nabatchi, 2012). Teagardin and colleagues (2012) stated that they excluded LEOs if they had a family member of close relative with ASD given that

prior knowledge of ASD may result in participant bias. Future research should consider the background of participants such as prior relationship and training related to ASD. In addition, collecting participant demographic information would allow for exploration of additional descriptive differences between groups.

In both studies, researchers developed outcome measures to reflect information obtained during their respective trainings. Outcomes relied on self-report measures, and psychometric information on the measures was not provided to assess reliability and validity. Murphy and colleagues (2017) utilized four self-report items that were designed to measure awareness of ASD, confidence around communication strategies, and confidence in approaching individuals experiencing a meltdown as well as one item that assessed helpfulness of the training. The other group of researchers (Teagardin et al., 2012) included 10 items related to LEOs' knowledge of ASD and two items measuring participants' level of confidence in identifying and interacting with individuals with ASD; however, authors did not include the measure within the published article or discuss the factor structure of the knowledge section.

Although it is important for training to improve participants' knowledge of ASD and confidence in interacting with individuals with ASD, incorporation of behavioral outcome measures would strengthen research into the effectiveness of ASD-specific trainings for LEOs. Researchers have proposed the following outcome measures when measuring the effectiveness of LEOs' training programs focused on mental health disorders that could be applied to ASD-specific training: (a) number of *use of force* occurrences during certain calls (e.g., involving individuals with ASD), (b) supervisor ratings of empathic communication, (c) satisfaction measures of individuals of interest (e.g., individuals with ASD) that interacted with LEOs, (d) satisfaction measures of community and mental health services that interact with LEOs, (e) number of arrests compared to total number of interactions with certain population (e.g., individuals with ASD), and (f) number of injuries during interaction between LEOs and individuals with disabilities (Krameddine et al., 2015). Empirical evidence does not yet connect the possession of knowledge of ASD with improvements in LEOs' behaviors during interactions with the ASD community; thus, behavioral change outcome measures should be utilized to evaluate training effectiveness. An essential step in measuring behavior change is to investigate and understand the behavior from the perspective of LEOs who will be expected to change their own behaviors after participating in the training.

Training facilitators may also consider including direct observations of LEOs during real-life interactions with individuals with ASD (via observation or body camera footage) as a potential behavioral outcome measure. After observing these encounters, a variety of individuals (e.g.,

supervisors, mental health providers, persons with ASD) could provide feedback on LEOs' behaviors and responses, and LEOs may also benefit from self-evaluations after watching interactions as this may increase their awareness of how they approach certain encounters. In addition to the need to incorporate behavioral outcomes, longitudinal research should also be conducted to allow for exploration of the long-term effects on LEOs' attitudinal and behavioral changes. Longitudinal studies may help training developers and implementers identify when to provide follow-up trainings based on when LEOs begin to lose knowledge and skills over time.

Another major finding in this review relates to the training content and format in the two identified studies. Despite statistically significant improvements in self-reported knowledge of ASD in one study (Teagardin et al., 2012), participants' scores on the posttest remained low for both the control and training groups (47% and 53%, respectively). These low scores may be related to the fact that the intervention solely involved a 13-min video that provided a general overview on how to identify and support individuals with ASD. Some disability sensitivity training programs for students and professionals have reported trainings that last between 8 (Shields & Taylor, 2014) and 12 weeks (Morgan & Lo, 2013). One training for LEOs that focused on anti-stigma and mental illness lasted 3 weeks (Hansson & Markström, 2014) while one of the newest training models to support interactions between LEOs and persons with mental illness, the Crisis Intervention Team (CIT) model, consists of a 40-hr course for LEOs (Thompson & Borum, 2006). Given the range in durations of similar trainings, it is important to consider the appropriate length to ensure that the ASD-specific training is effective while remaining considerate LEOs' time and other demands.

Although posttest scores remained fairly low in Teagardin and colleagues' (2012) study, it is promising to learn that LEOs' knowledge of ASD improved with a brief, video-only intervention. This is especially important given that law enforcement departments require LEOs to receive training on a variety of topics, from tactical skills to traffic laws. Thus, the need to focus on such a large amount of content may limit the time that LEOs can participate in a training solely related to ASD. Despite the need to receive a training on a vast number of topics, LEOs would benefit from ASD-specific training given that 20% of individuals with ASD report interactions with LEOs by the time they reach their mid-twenties (Rava et al., 2017). Providing ASD-specific training is likely to decrease the likelihood of negative outcomes during interactions between LEOs and individuals with ASD, which benefits both law enforcement departments and the ASD community.

Although the training provided in the study by Murphy and colleagues (2017) was longer than a 13-min video, limited information about the training format and content was

provided outside of the training duration of 90 min in length. In addition, authors note that the training content focused on awareness of ASD, communication strategies, and management of individuals engaging in "meltdowns" (Murphy et al., 2017) with no discussion of their training approach. Given the effectiveness of active engagement in learning (Dunst et al., 2010) and its focus in the andragogical approach, Dunst and Trivette's (2009) Participatory Adult Learning Strategy (PALS) is a useful adult training model to inform autism-specific law enforcement trainings. In a meta-analysis on the PALS model, Dunst and colleagues (2010) found that the following adult learning characteristics were associated with the largest mean effect sizes (shown in parentheses): (a) identifying personalized training goals (1.27), (b) self-assessing strengths and weaknesses (0.94), (c) applying concepts to "real-life" (0.94), (d) role-playing "real-life" scenarios (0.86), and (e) completing a standards-based assessment (0.86).

When considering results from Teagardin and colleagues' (2012) research, low posttest knowledge scores may be attributed, at least in part, to the fact that effective adult learning strategies were not incorporated into the 13-min video training. Knowledge of these effective characteristics (Dunst et al., 2010) can inform further training efforts, and future research should continue to examine the influence of various active ingredients in effective ASD-specific training. Regarding ASD training, role-play scenarios and examples of how knowledge of ASD can be applied directly to LEOs' work would be beneficial. Research suggests that LEOs also prefer videos and small-group discussion when asked about preferred format for training related to mental illness (Vermette et al., 2005). It is also important for LEOs to receive feedback after they participate in role-play activities and engage in discussion (Silverstone et al., 2013). In addition, LEOs would benefit from engagement in a self-assessment process and reflection on their experiences and knowledge to continue the application of the new information and skills.

Future ASD-specific trainings should consider the benefits of incorporating aspects of the CIT training model given its didactic, experiential, and practical training format. Like the format of the CIT model, ASD-specific trainings should focus on the inclusion of community providers, family members, and individuals with ASD as well as collaboration with mental health providers and other community stakeholders (Compton et al., 2010; Thompson & Borum, 2006). Given findings that ASD-specific trainings for LEOs have the potential to improve knowledge of ASD and increase LEOs' confidence in interacting with people with ASD (Murphy et al., 2017; Teagardin et al., 2012), practitioners and researchers should continue to explore and identify which training components, characteristics, and modalities are most effective.

Educational Implications

According to the *National Association of School Resource Officers* (NASRO), school-based policing is the fastest growing area of law enforcement (NASRO, n.d.) and, although our review did not include school-based officers, we believe that the findings of this research directly apply to this unique category of LEOs. School staff members, including administrators, therapists, school psychologists, and other personnel, frequently rely on school resource officers (SROs) to keep students and staff safe as well as to address challenging behavior (e.g., aggression, elopement, self-injurious behavior, making threats) that students with and without disabilities engage in within school settings. The *Safe and Drug Free Schools and Communities Act* (SDFSCA) encourages SROs to focus on the development and expansion of justice initiatives for all students, and SRO programs are typically grounded in community- and problem-oriented policing with an emphasis on prevention strategies (Development Services Group, Inc., 2010; SDFSCA, 2004). To promote justice for all students and to implement preventive solutions, it is important that SROs understand the unique needs of students with disabilities, including those with ASD. However, little information is known about SROs' knowledge of disabilities and effective implementation of disability- and ASD-specific training for SROs.

Findings from a review of 22 court decisions related to SROs' interactions with students with disabilities suggest that a significant number of incidents resulted in SROs using excessive force when the students' behavioral concerns were often related to their disability (Zirkel, 2019). Another study found that 84.8% of SROs reported that they "somewhat agreed" that students with disabilities used their special education status as an excuse for their behavioral difficulties and to avoid taking responsibility for their actions (May et al., 2012). Given these findings and schools' adherence to zero tolerance policies, school systems may be at risk for disproportionately suspending or even arresting students with disabilities, whose actions may be a manifestation of their disability. In fact, the U.S. Department of Education has found that students with disabilities were arrested at a rate of 29 per 10,000 students, which is approximately three times higher than their typically developing peers (U.S. Department of Education, 2019). SROs are uniquely positioned to obstruct the school-to-prison pipeline for students with disabilities given that they are mandated to comply with federal special education laws and to consider the individual needs of students during their interactions with students receiving special education services. Although the literature is limited, what we do know suggests that SROs would benefit from specific training in strategies to support students with ASD.

Currently, national standards outlining training requirements for SROs does not exist (Ryan et al., 2018). Although

the American Civil Liberties Union recommended that SROs should receive training on strategies to support students who display social communication and behavioral differences, a review of curriculum suggests that most SRO training typically centers around juvenile justice codes and legal issues rather than focusing on behavior management, child and adolescent development, and effective de-escalation and communication techniques (Whitaker et al., 2019). This lack of standardized training in disabilities is especially concerning given that many students receiving special education services, including those with ASD, have specific behavioral intervention plans that schools are required to follow to optimize students' educational success. Research has also identified gaps in SRO training related to disabilities. Specifically, one study found that over half of SROs had not received either academic training (58.8%) or in-service training (56.5%) related to special education and strategies to support students with disabilities (May et al., 2012). Without appropriate training on the nature of disabilities, including ASD, it is likely that SROs may not be well-equipped to support the needs of students with disabilities using individualized, appropriate strategies. Our review revealed no published evaluations of ASD training for SROs; however, we believe our general recommendations and approaches to training apply to this group of LEOs.

Future Research

Given the scarcity of identified research and methodological limitations of the included studies, future research is warranted. Although this study focused on training reports from academic sources, it may be helpful to also review training reports that are described in state/municipal government reports, department training bulletins, and other similar sources. In addition, future researchers should utilize random sampling of participants and adequate sample sizes that include unbiased participants. To examine differences across cultural contexts and geographical locations, studies should be conducted in the United States and other countries as law enforcement department may differ for a variety of reasons. Both studies identified in the review are cross-sectional in nature, which suggests the need for longitudinal studies to evaluate changes over time. There is a need for researchers to explore which training characteristics and modalities are most effective to inform future training development. For example, researchers could investigate the effectiveness of video- or online-only versus in-person trainings. Further examination of the design and utilization of reliable, valid measures to evaluate outcomes would be useful. Finally, outcome measures should include direct behavioral outcomes in addition to investigating self-reported changes in knowledge, attitudes, and/or intentions.

Given the small yield of articles focused on LEO interventions from a larger corpus of research (i.e., 2 of 607 articles), we began implementation of a scoping review of the literature that examines various aspects of ASD and the larger CJS. In our focused review of LEO training, we identified numerous articles from the group of 606 that pertain to ASD-CJS interactions and are organizing these into a coherent scoping review of the literature (Railey et al., 2020). To date, we have organized articles into several themes that pertain to many aspects of ASD-CJS interaction, from initial encounter with LEOs to ASD experiences of long-term incarceration.

Strengths and Limitations of the Review

The overall approach to this review was strengthened by the development of an a priori protocol and adherence to the PRISMA guidelines (Moher et al., 2015). An additional strength included the fact that key terms were broad, and no date restrictions were placed on the search. Only one study (Murphy et al., 2017) was found by hand-searching reference lists and conducting citation searches, which indicates that the original search was reliable in targeting relevant papers. Another strength of the study involves the collaboration of three researchers during the search and eligibility decision process. Specifically, two researchers made independent decisions regarding inclusion of articles, which resulted in a percentage of agreement between researchers of 100% during both the screening and eligibility phases.

Despite strengths of the current review, findings are limited to the search terms, databases, and journals included in the process. Although several librarians and ASD researchers were involved in selecting key terms and search engines, it is possible that not all available research was identified. In addition, the two included studies varied in the standards with which they were conducted and reported; therefore, findings are a direct reflection of methodological limitations of the included studies.

Conclusion

Research suggests that several encounters between LEOs and members of the ASD community have resulted in a variety of outcomes, including arrest or death (Copenhaver & Tewksbury, 2019). The potentially negative consequences of these interactions highlight the need for LEOs to receive specialized training in autism, which focus on identification of characteristics of ASD and engagement in strategies to support people with ASD. Despite the need for ASD-specific training for LEOs, the present comprehensive search of literature identified only two studies that empirically investigated effects of law enforcement trainings related to ASD. The two studies varied in their methodological approaches and outcomes; however, both studies utilized only short-term

knowledge and attitudinal measures and included potentially bias, small sample sizes. Although both studies provide promising results (Murphy et al., 2017; Teagardin et al., 2012), the review highlights the need for more empirical evidence to establish effective training protocols for teaching LEOs to support people with ASD. Findings from this study serve as a steppingstone to understanding available literature and act as a catalyst for further research in this area.

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