ORIGINAL RESEARCH

Journal of
COMMUNITY SAFETY & WELL-BEING

A meta-analysis of the effect of violence intervention programs on general and violent recidivism

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ABSTRACT

Individuals with convictions for violence are likely to have both violent and nonviolent subsequent reoffences. Individuals who have committed violent offences are often required to participate in violence treatment programming prior to release. The aim of this study was to examine whether violence intervention programs offered in community or institutional correctional settings are effective for reducing general and violent recidivism among individuals with previous histories of violence. In total, 21 controlled studies with data from 17,223 violent offenders (99% men) were included in the meta-analysis for general recidivism, and 19 controlled studies with data from 8,863 offenders (99% men) were included in the meta-analysis for violent recidivism. This article extends an earlier meta-analysis by Papalia et al. (*Clinical Psychology: Science and Practice*, *26*(2), 1–28 [2019]) by adding seven new studies to the meta-analysis of general recidivism and five new studies to the meta-analysis of violent recidivism. The results of the meta-analysis indicate that the odds of general recidivism were 25% lower, and the odds of violent recidivism were 24% lower for individuals who participated in interventions compared with the control groups. The results of the present study are consistent with previous meta-analyses, which support the use of correctional violence treatment programs. Implications for future research are identified, considering these findings.

Key Words Violent offenders; violence treatment; offender treatment.

INTRODUCTION

While individuals who commit violent offences are a small proportion of individuals who commit crimes overall, they are responsible for a large proportion of crime (Palmer, 2017). Violent offenders are likely to have both violent and nonviolent subsequent reoffences (Polaschek & Wong, 2020); therefore, reducing their recidivism is important for increasing public safety and community well-being. It is common for correctional authorities and parole boards to require that individuals who have committed violent offences participate in treatment programming prior to their release from custody or as a requirement of a community-based sentence (Daffern et al., 2018; Papalia et al., 2019). These interventions are offered in correctional facilities, inpatient mental health units, and the community, although they vary in treatment modality, duration, and intensity (Jolliffe & Farrington, 2007; Papalia et al., 2019). There is a growing consensus that outcomes for offenders, including recidivism, can be improved through evidence-based correctional interventions that address their needs and risks.

Since the 1990s, the Risk-Need-Responsivity (RNR) Model of Offender Assessment and Treatment (Andrews & Bonta, 2010) has been the accepted model of correctional intervention. The RNR model guides the assessment of risk to determine which individuals receive treatment, treatment goals, and how treatment will be delivered (Andrews et al., 2006). Extant research has demonstrated that interventions that follow the principles of RNR are most effective for reducing recidivism (Andrews & Bonta, 2010; Andrews et al., 2006; Bonta & Andrews, 2017; Olver et al., 2011; Palmer, 2017; Polaschek & Wong, 2020).

A positive outcome of the movement towards evidence-based practices is a growing number of researchers who

Supplemental material for this article available online at journalcswb.ca/index.php/cswb/article/view/308/supp_material.

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To cite: Giesbrecht, C. J. (2023). A meta-analysis of the effect of violence intervention programs on general and violent recidivism. *Journal of Community Safety and Well-Being, 8*(2), 99–106. https://doi.org/10.35502/jcswb.308

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are publishing studies using untreated comparator groups to examine differences in reoffending between those who participate in intervention programs and those who do not. Meta-analysis is a way to synthesize the results of empirical studies that include both treated and control groups to determine what we currently know about the efficacy of violence intervention programs for reducing reoffending (Borenstein et al., 2021; Turanovic & Pratt, 2021).

The aim of this study was to examine whether violence intervention programs offered in community or institutional correctional settings are effective for reducing general and violent recidivism. Four research questions were addressed: (1) Do violence intervention programs reduce general (i.e., any) recidivism? (2) Do violence intervention programs reduce violent recidivism? (3) Are treatment effects moderated by characteristics such as the year and country in which the study was conducted, sample size, or inclusion of intent-to-treat (ITT) or completers in the treatment condition? And (4) Are effects moderated by intervention characteristics such as program type or duration?

Prior Meta-Analyses of the Effect of Violence Intervention Programs on Recidivism

Jolliffe and Farrington (2007) carried out meta-analyses of 11 studies of general recidivism and eight studies of violent recidivism. They found that individuals participating in intervention programs were 8–11% less likely to be reconvicted of a general offence and 7–8% less likely to be reconvicted of a violent crime. A meta-analysis by Henwood et al. (2015) examined the effectiveness of cognitive-behavioural therapy (CBT)-based anger management programs on recidivism. Their analysis included 14 studies, and they reported that participation in interventions reduced the risk of general recidivism by 23% and of violent recidivism by 28%. With respect to program delivery, moderate-intensity CBT-informed anger management programs had a larger effect than high-intensity CBT programming.

Papalia et al. (2019) analyzed 16 studies of general recidivism, including ten studies also included by Jolliffe and Farrington (2007) and 16 studies of violent recidivism, doubling the number included in Jolliffe and Farrington's (2007) analysis. They found that participation in violence intervention programs reduced the odds of general recidivism by 35% and the odds of violent recidivism by 31%. A subsequent meta-analysis of 22 studies conducted by Papalia et al. (2020) assessed whether psychological treatments were related to changes in dynamic risk factors for offenders with histories of violence. Their analysis revealed that treatment reduced trait anger and impulsivity and increased problem-solving and social skills.

Gannon et al. (2019) conducted a meta-analysis of 70 studies to determine the effect of specialized psychological treatments on general recidivism as well as domestic and sexual violence. Overall, they found a 20.4% decrease in general recidivism and a 33.3% reduction in violent recidivism. Their results also indicate improved outcomes when treatment is delivered by a registered psycholkogist and when clinical supervision is available for staff. Altogether, the results of this prior research show a promising relationship between participation in psychologically-based correctional interventions and reductions in general and violent recidivism.

METHODOLOGICAL STRATEGIES

Inclusion Criteria

Population

The analyses were limited to studies of adults who had been convicted of a violent offence and had participated in a psychological violence treatment/intervention program in a community-based or custodial correctional setting. Consistent with Papalia et al. (2019), the present research focused on general violent offenders (i.e., those who had committed violent non-sexual offences such as assault or aggravated assault against victims who were not intimate partners). Studies that included only perpetrators of domestic or sexual violence and juveniles were excluded.

Interventions

Psychological treatment/interventions were included in the analyses if they had the specified objective of reducing violent, aggressive, and/or antisocial behaviour for adults with a history of violent offending. Examples of interventions evaluated in the included studies are CBT and anger management programs. As the objective was to assess the efficacy of violence intervention programs, studies evaluating other rehabilitative options, such as employment programs, were excluded from the analyses.

Outcome Data

To be included in the analysis, studies needed to report recidivism after participation in the intervention. Studies that reported any type of recidivism (e.g., reoffence, reconviction, or return to custody) were eligible for inclusion (Supplemental Table I details the recidivism measures used in the analysis). Two meta-analyses were conducted to examine two types of recidivism: violent and general (i.e., any) reoffending.

Comparison Groups

Studies were included in the analysis if they reported results for a group of individuals who participated in the intervention as well as a control group. Control conditions included treatment-as-usual (TAU) or untreated offenders, including waitlist control groups or no-treatment groups. Randomized control trials (RCTs) fit the criteria, as did quasi-experimental designs if treatment and control groups were matched on pre-treatment variables (e.g., risk level, sentence length, race, age, and education).

Quality of Included Studies

Studies were rated using the University of Maryland Scientific Methods Scale (MSMS; Farrington et al., 2002; Sherman et al., 1998). To be included in the analysis, studies needed to be ranked as MSMS Level 3 (measuring crime before and after the intervention in comparable treatment and control conditions) or higher. Correlational and pre–post studies without a control condition (Levels 1 and 2) were excluded.

Search Strategy and Study Selection

This research replicates and extends a meta-analysis conducted by Papalia et al. (2019), adding research published up to July 5, 2021. These studies—and their characteristics—are shown in Supplemental Table I. Studies were located by

searching Google Scholar as well as government websites from Australia, Canada, the United Kingdom, and the United States. Articles that did not report outcome data for individuals with a history of violent offending separately from other offenders in the sample were not used in the current analysis unless more than 90% of the treatment group had committed a violent offence (see Supplemental Table I). The authors of three studies (Arbour, 2021; Capellan et al., 2022; Seewald et al., 2018) provided outcome data via e-mail for individuals who had committed violent offences within their sample. Some researchers reported results for individuals who completed the intervention, while others used an ITT design (reporting outcomes for those who were assigned to the treatment group, regardless of whether they completed the intervention). When outcome data were available for both completers and ITT, the ITT data were used (see Supplemental Table I). Figure 1 illustrates the study selection process. Altogether, a total of 24 studies were included in the two meta-analyses: 21 studies of general recidivism and 19 studies of violent recidivism. Sixteen studies report outcomes for both general and violent recidivism (see Supplemental Table I).

Synthesis of Results

Comprehensive Meta-Analysis version 3.0 software (Borenstein et al., 2013) was used to conduct the analyses, including the calculation of individual effect sizes and meta-analyses of effect sizes. Odds ratios (OR) were used to summarize the effect size of recidivism outcomes. The random-effects model was used, as this approach assumes that the included studies are a random sample of studies that could exist and true effects could vary among studies (Borenstein et al., 2010, 2021).

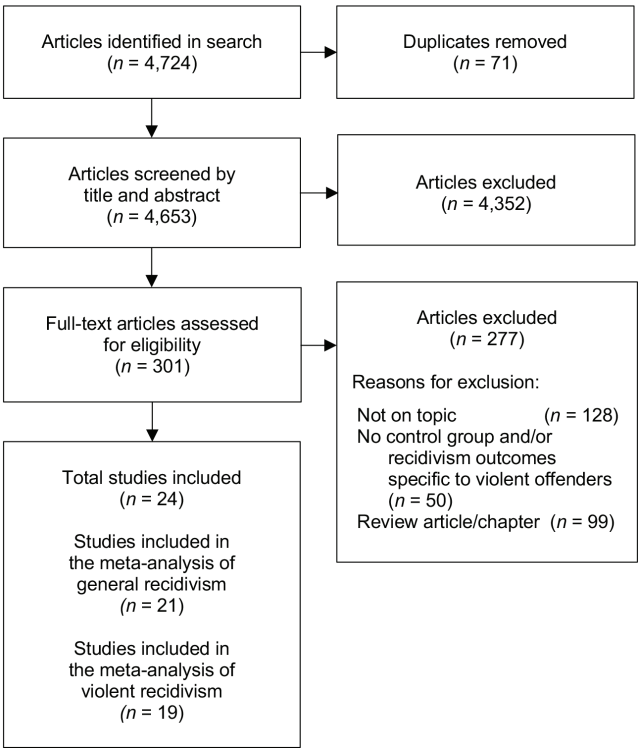

FIGURE 1 Articles identified and included in the meta-analysis

RESULTS

Descriptive Data for Included Studies

Descriptive data for individual studies included in the meta-analyses for general and violent recidivism are included in Supplemental Table I.

General Recidivism

The meta-analysis for general recidivism included 21 studies published between 1993 and 2021.[1] The authors of these studies assessed the outcomes of 17,223 adults with a history of violent offending who were under correctional supervision. Almost all (99%) participants were men (n = 17,076); less than 1% were women (n = 147). Participants' mean age was 30.35 (standard deviation [SD] = 3.13, range: 23–48 years). Seven studies used unmatched comparison groups (MSMS Level 3), eight employed matched comparison groups (Level 4), and six randomly assigned participants to treatment and control conditions (Level 5). Eight interventions were delivered specifically for individuals assessed as having a high risk to reoffend, while eight others were delivered to individuals of varying risk levels. Five studies did not report participants' risk levels.

Sixteen of these interventions were delivered in correctional facilities, four took place in the community, and two were offered in inpatient forensic units. Robinson (1995) reported results from the delivery of the intervention in an institution and in the community; these were combined to create one effect size. Most (15 of 21) of the treatment/intervention programs included in the meta-analysis were cognitive-behavioural. Outcomes from four interventions reported by Lugo et al. (2019) were combined to produce one effect size—one of these programs was cognitive-behavioural, and another related to anger management. Most of the interventions were delivered in a group format (k = 15) or involved a combination of group and individual programming (k = 5), and one program can be delivered either as a group or one-to-one (k = 1). No studies in the present analysis focused on interventions solely delivered one-to-one. The average length of programming was 127.8 hours (SD = 122.27, range: 21–330 hours).[2]

Supplemental Table I indicates the measures of recidivism included in the meta-analysis. These included: reoffence (k = 7), reconviction (k = 10), and return to custody (readmission) (k = 4). Some of the researchers provided data for multiple measures of recidivism. In 19 of the studies, data used in the analysis of general recidivism outcomes include any reoffending (both violent and nonviolent); however, in two studies (Barnes et al., 2017/Hyatt, 2013; Polaschek et al., 2005), available data for general recidivism comprised nonviolent offences.

Violent Recidivism

The meta-analysis for violent recidivism included 19 studies published between 1993 and 2021. These studies assessed the outcomes of 8,863 adults with a history of violent offending.

[1] Capellan et al. (2022) was first published online in 2020.

[2] Lugo et al. (2019) did not report the length of the various interventions. Two studies reported the length of the treatment in months (Motiuk et al., 1996, 8 months, and Wong et al., 2012, 8–9 months). These studies are not included in the average presented in the descriptive statistics.

The demographic characteristics of this sample were similar to those in the general recidivism sample: 99% were men (n = 8,752), and approximately 1% were women (n = 111). Their mean age was 29.27 (SD = 4.31, range: 23–48 years). Included studies were rated as MSMS Level 3 (k = 9), Level 4 (k = 7), and Level 5 (k= 3). Eight of the interventions in the analyzed studies were delivered specifically for individuals assessed as a high risk to reoffend, whereas nine were delivered to individuals of varying risk levels. Two studies did not report participants' risk levels.

Interventions were delivered in correctional facilities in the majority of studies (k = 15); others were delivered in the community (k = 2) and inpatient forensic units (k = 2). With respect to treatment orientation, 15 of the programs included in the meta-analysis had a cognitive-behavioural approach. About two-thirds of these interventions were delivered in a group format (k = 13); the remainder involved a combination of group and individual programming (k = 6). The average length of programming was 148.25 hours (SD = 145.00, range: 21–470 hours), which was about 20 hours longer than the average for interventions in the general recidivism sample.[3] Three recidivism measures were considered in the analysis, including reoffence (k = 7), reconviction (k = 10), and readmission (k = 2). Some studies provided data for multiple measures of recidivism; Supplemental Table I indicates measures of recidivism included in the meta-analysis.

Treatment Effects

Figures 2 and 3 present the OR and associated statistics for the meta-analyses of general and violent recidivism after participation in intervention programs.

General Recidivism

Overall, eight of the 21 studies reported a statistically significant ($p \leq .05$) reduction in general offending, eight showed a non-significant reduction, one study reported a p value of 1.000, and four showed a non-significant increase in recidivism. Using the random-effects model, the pooled OR was 0.750 with a corresponding p value of ≤ .001. Therefore, the odds of general/nonviolent recidivism were 25% lower for individuals who participated in interventions compared with the control group. The 95% confidence interval (CI) is 0.644 to 0.875; this is an index of the precision of the estimate of the mean effect size. The Z value for testing the null hypothesis (that the mean effect size is zero) is -3.675.

The Knapp-Hartung adjustment yields a wider confidence interval, which is more accurate when using the random-effects model (Borenstein, 2019). Using the Knapp-Hartung adjustment, t = -3.636, df = 20, the 95% CI is 0.638 to 0.887. The prediction interval of 0.14 to 4.06 is an index of how broadly the effect size varies across populations; therefore, the true effect size in 95% of all comparable populations falls within this interval (Borenstein, 2019).

The Q statistic tests the null hypothesis that all studies in the analysis share a common effect size. The Q value is 52.03 with 20 degrees of freedom and $p \leq .001$; therefore, the null hypothesis (that all studies in the analysis share a common effect size) is rejected. The I^2 statistic tells us that 61.56% "of the variance in observed effects reflects variance in true effects rather than sampling error" (Borenstein, 2019, p. 265). The highest standard residual was 1.57; therefore, the difference between the observed and expected value is low.

The authors of three studies provided results for violent offenders within their larger samples of offenders. One of these, Capellan et al. (2022), included 15 violent offenders. Due to the size of this sub-sample, the results of this study display a wider confidence interval. Using the random-effects model, this study is assigned the lowest relative weight (less than 1%), whereas studies with larger samples (e.g., Barnes et al., 2017/Hyatt, 2013; Higgs et al. 2019; Lardén et al., 2018; Lugo et al., 2019) are assigned a greater relative weight (between 8.5% and 18.5%). The pooled OR using the "one study removed" approach ranged from 0.722, $p \leq .001$ (removing Lugo et al., 2019) to 0.782, $p \leq .001$ (removing Polaschek et al., 2016); therefore, the results of the meta-analysis do not change significantly with any studies removed.

Violent Recidivism

Overall, four of the 19 studies reported a statistically significant ($p \leq .05$) reduction in violent recidivism, ten showed a non-significant reduction, one study reported a p value of approximately 1.000, and four showed a non-significant increase in recidivism. Using the random-effects model (I^2 = 31.68%; Q = 26.35; $p \leq .001$), the pooled OR was 0.760 with a 95% CI of 0.644 to 0.896 and a corresponding p value of ≤ .001 and Z value of -3.258. Therefore, the results of the meta-analysis indicate that the odds of violent recidivism were 24% lower for individuals who participated in the intervention compared with the control group. Applying the Knapp-Hartung adjustment, t= -3.26, df= 18, the 95% CI is 0.644 to 0.896. The prediction interval is 0.14 to 4.17. The highest standard residual was 1.55; therefore, the difference between the observed and expected value is low.

Using the random-effects model, weights assigned to the 19 studies ranged from 1.5% (Wong et al., 2012) to 16.5% (Lardén et al., 2018). The pooled OR using the "one study removed" approach ranged from 0.730, $p \leq .001$ (removing Lardén et al., 2018) to 0.795, $p \leq .003$ (removing Polaschek et al., 2005) or 0.795, $p \leq .004$ (removing Polaschek et al., 2016).

Moderator Effects

Supplemental Table II presents the results of meta-regressions examining how methodology and intervention characteristics moderate the effect of intervention programs on general and violent recidivism. Two moderator variables had a statistically significant effect on general recidivism: sample size ($p \leq .001$) and duration of the intervention (in hours) ($p \leq .05$). Four moderator variables had a statistically significant impact on violent recidivism: analysis (ITT or completer), publication year, sample size (all significant at the $p \leq .001$ level), and duration of the intervention (in hours) ($p \leq .05$).

DISCUSSION

The goal of the present study was to examine whether, overall, the provision of violence intervention programs offered in

[3]Two studies reported the length of the treatment in months (Motiuk et al., 1996, 8 months, and Wong et al., 2012, 8–9 months) and one reported the length of treatment in years (Seewald et al., 2018, as per J. Gerth, personal communication 2021, 4.4 years). These studies were not included in the average presented in the descriptive statistics.

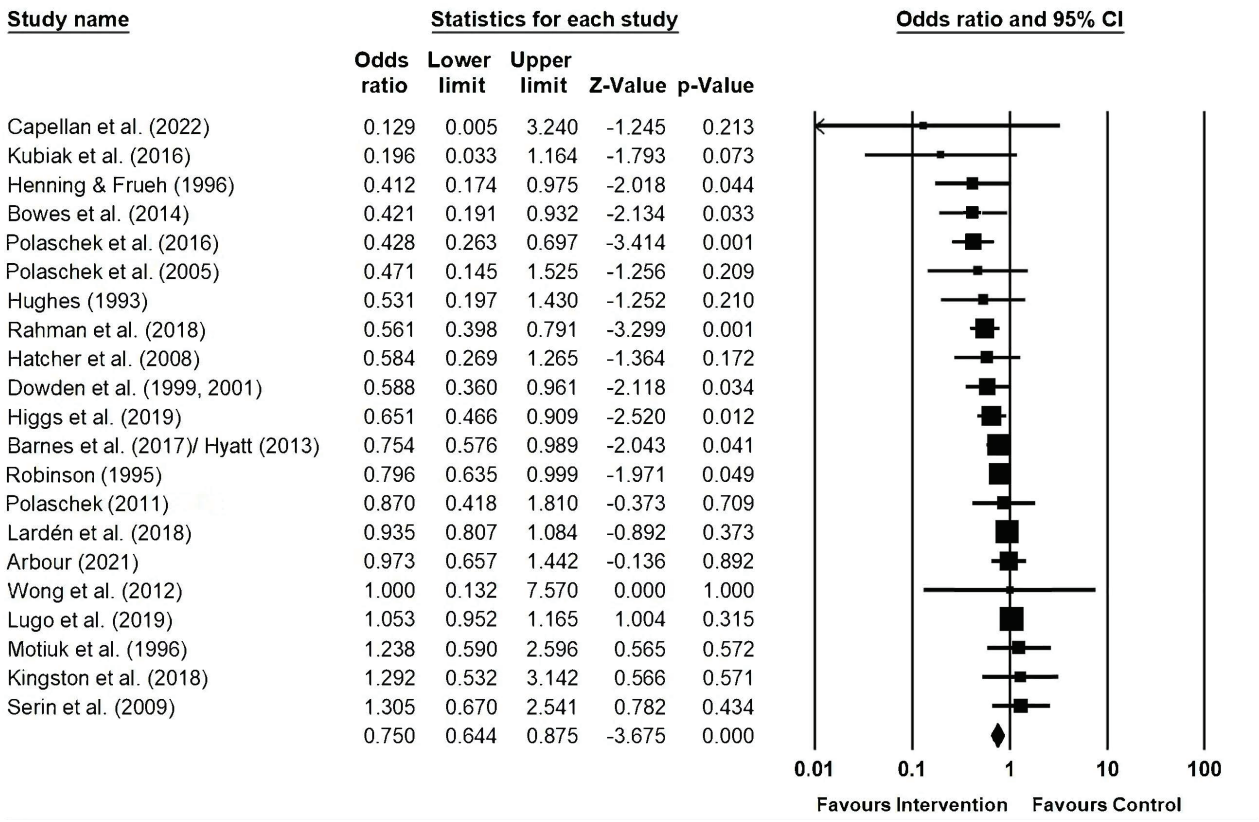

FIGURE 2 Meta-analysis of intervention effect on general recidivism. Note: Displays random-effects model.

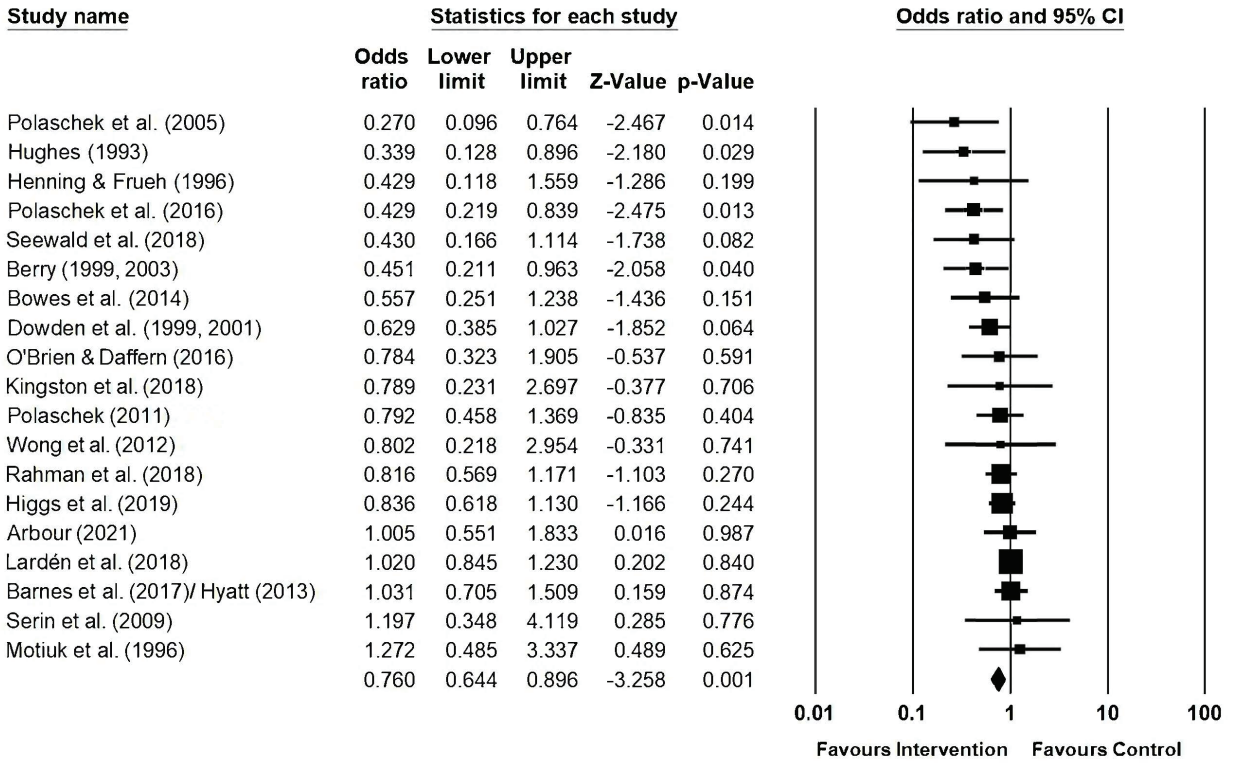

FIGURE 3 Meta-analysis of intervention effect on violent recidivism. Note: Displays random-effects model.

community or institutional correctional settings is effective for reducing general and violent recidivism among individuals with previous histories of general violence (i.e., not intimate partner or sexual violence). This study replicates and extends the research conducted by Papalia et al. (2019) by adding seven new studies to the meta-analysis of general recidivism and five new studies to the meta-analysis of violent recidivism. The present meta-analyses show that taken together, the odds of general recidivism were 25% lower, and the odds of violent recidivism were 24% lower for individuals who participated in interventions compared with the control groups. The results presented above are consistent with previous meta-analyses, which support the use of correctional violence treatment programs (see also Henwood et al., 2015; Gannon et al., 2019; Jolliffe & Farrington, 2007; Papalia et al., 2019). These findings support making violence intervention programming available to men who have perpetrated violent offences to reduce future incidents of violent offending, as well as reoffending generally, therefore helping to increase public safety and community well-being. Further, reducing recidivism not only improves the lives of others (including direct and collateral victims), it improves the lives of individuals who have previously used violence.

As the present study incorporated all available studies that reported recidivism data after participating in violence intervention programming for a treatment and control group, the results provide insight into the overall effectiveness of violence intervention programs on general and violent recidivism. There is considerable variability among the studies included in the meta-analyses. The present analyses used outcomes for ITT (individuals who were assigned to the treatment group, regardless of whether they completed the intervention) when available; however, the studies used in the analyses included those that provided recidivism outcomes for ITT and for treatment completers only. Meta-regressions of moderator effects (Supplemental Table II) show that the method of analysis (ITT or completers only) had a statistically significant impact on violent recidivism outcomes. Sample size had a statistically significant effect on both general and violent recidivism (Supplemental Table II).

Another area of difference among the programs evaluated in the included studies was length. Intervention programs included in the meta-analysis of general recidivism ranged from 21 to 330 hours (M = 127.8 hours); programs in the meta-analysis of violent recidivism ranged from 21 to 470 hours (M = 148.25 hours). This moderator variable had a statistically significant effect on both general and violent recidivism (Supplemental Table II).

Studies included in two meta-analyses were published between 1993 and 2021. Publication year had a statistically significant effect on violent recidivism (Supplemental Table II). Knowledge regarding "what works" for intervening with individuals who use violence has advanced during these three decades, including the acceptance of the RNR Model of Offender Assessment and Treatment (Andrews & Bonta, 2010), which guides the assessment of risk to determine which individuals receive treatment, their treatment goals, and how treatment is delivered in accordance with individuals' specific needs and responsivity factors (Andrews et al., 2006). Only three studies in the meta-analyses specified that the programs being evaluated were guided by the principles of RNR (Lugo et al., 2019; Seewald et al., 2018; Wong et al., 2012). It was not possible to assess the extent to which other interventions adhered to the principles of RNR.

While not statistically significant in the analyses of moderator variables, there were other areas of variability among the treatment/intervention programs included in the meta-analyses (characteristics of these programs are displayed in Supplemental Table I). For example, the majority of the programs included in the meta-analyses for general recidivism (15 of 21) and violent recidivism (15 of 19) were cognitive-behavioural programs. These programs ranged in length (hours and weeks), and fewer interventions were based on anger management or other approaches. The majority of programs were delivered in a group treatment format; some also offered individual sessions in addition to the group. Eight interventions (in both meta-analyses) were delivered specifically to individuals assessed as having a high risk to reoffend; other interventions were delivered to individuals of varying risk levels, or information regarding risk level was not reported. In addition, the analyses included three different recidivism measures: reoffence, reconviction, and readmission.

While the meta-analyses included studies of interventions delivered for people of any gender with a history of violent offending, individuals included in the analyses were 99% men (17,076 of the 17,223 sample for general recidivism and 8,752 of the 8,863 sample for violent recidivism). Therefore, it should not be assumed that these findings are applicable to violence interventions with women offenders. More research is needed into gendered differences in the perpetration of general violence and "what works" for people of different genders who have used violence.

CONCLUSION

The present study determined that, overall, group violence intervention programs offered in community or institutional correctional settings are generally effective for reducing general and violent recidivism for men with previous histories of general violence. There is a substantial amount of variation in the studies included in the meta-analyses, including the year the studies were published, the methods of analysis, and measures of recidivism outcomes. There is also substantial variation in the intervention programs being evaluated (including cognitive-behavioural and anger management interventions, length of programs, and assignment to programming according to participants' risk level).

A continuing challenge for researchers is identifying the specific program models and characteristics of group interventions (e.g., length) that are the most effective, as well as the demographic, psychological, and offence-related characteristics of individuals who reduce subsequent offending after participation, to determine what works for different types of offenders and how violence intervention programming can be most effectively delivered in accordance with individuals' specific risks, needs, and responsivity factors (RNR; Andrews et al., 2006; Andrews & Bonta, 2010; Bonta & Andrews, 2017; Olver et al., 2011; Palmer, 2017; Polaschek & Wong, 2020).

ACKNOWLEDGEMENTS

This article is dedicated to Dr. Rick Ruddell. Rick supervised this project and offered a tremendous amount of support and encouragement

throughout. He is greatly missed. Sincere thanks to Dr. Kaila C. Bruer, Dr. N. Zoe Hilton, and Dr. Barna Konkoly-Thege for providing valuable feedback. Thank you to the authors who responded to questions regarding their research, including Dr. Nina Papalia. The author gratefully acknowledges the support of a Vanier Canada Graduate Scholarship. The study protocol was registered with PROSPERO and may be viewed at crd.york.ac.uk/PROSPERO using the registration number CRD42021255524.

CONFLICT OF INTEREST DISCLOSURES

The author declares that there are no conflicts of interest.

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SUPPLEMENTAL MATERIAL

Supplemental material linked to the online version of the paper at journalcswb.ca/index.php/cswb/article/view/308/supp_material

- **Supplemental Table I** Key descriptive data for studies included in the meta-analyses for general and violent recidivism
- **Supplemental Table II** Results of meta-regressions with single covariates for general and violent recidivism

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