Adverse experiences and mental health problems in perpetrators of intimate partner violence in Northern Ireland: A latent class analysis

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Trauma, mental health problems and intimate partner violence

Abstract

Background: Trauma and adverse experiences among perpetrators of intimate partner violence (IPV) have been associated with more serious patterns of offending. **Objective:** To examine 1) how traumatic and adverse experiences cluster together and co-occur among IPV perpetrators, and 2) whether different patterns of trauma exposure are associated with specific mental health problems. **Participants and setting**: The sample consisted of 405 convicted IPV perpetrators from Northern Ireland. **Methods**: Data was collected between 2018 and 2019. Latent class analysis identified typologies of exposure to traumatic and adverse experiences. A series of binary logistic regression analyses explored associations between the identified classes and five categories of probable mental health problems. **Results:** Three adversity classes were identified: a baseline class (59.2%), characterised by relatively low levels of exposure to most types of adversity; a 'childhood adversity' class (32.9%), with high levels of childhood adversity; and a 'community violence and disadvantage' class (7.9%), which had high probabilities of endorsing adversities related to economic hardship and community violence. Regression analyses showed that the childhood adversity class was significantly associated with increased likelihood of all categories of mental health problems, except for neurodevelopmental disorders (ORs = 1.77-3.25). The community violence and disadvantage class was significantly associated with probable mood and anxiety disorder (ORs 3.92 and 8.42, respectively). **Conclusions**: Different patterns of exposure to adversities were associated with distinct mental health problems in the present sample. Early intervention to prevent poly-victimisation, the clustering of adversities in childhood and the resulting accumulation of risk may be a useful component of preventive responses for IPV in Northern Ireland.

Keywords: intimate partner violence, domestic violence, trauma, adverse childhood experiences offending, probation, latent class analysis

Introduction

Traumatic experiences are very threatening or horrifying events or series of events which may produce reactions of extreme stress, such as symptoms of post-traumatic stress disorder (PTSD; World Health Organisation, 2020). Adverse experiences include stressful life events which are potentially, but not necessarily traumatic. That is, all traumatic experiences are adverse experiences, but the reverse is not necessarily true. However, both traumatic and adverse experiences have significant potential to produce wide-ranging and long-term negative effects (Felitti et al., 1998).

Research on traumatic and adverse experiences suggests that adversities are likely to co-occur, and that their co-occurrence confers significantly increased risk of negative outcomes, such as displaying symptoms of traumatisation (Finkelhor, Ormrod & Turner, 2007), as well as adverse behavioural outcomes such as engagement in criminal behaviour (Wolff et al., 2018). The types of adversity, as well as the developmental stage at which they are experienced, may produce distinct ecophenotypes (Ballard et al., 2015) associated with distinct mental health and psychosocial problems (Barboza, 2018).

Latent class analysis is a technique that can examine the ways in which adverse experiences cluster together and co-occur, which is vital for developing improved and earlier intervention strategies. The technique has been applied to identify typologies of childhood maltreatment (e.g., Armour, Elklit & Christoffersen, 2014; Nooner et al., 2010) and other types of adverse experiences (e.g., Ballard et al., 2015; Barboza, 2018; Wolff et al., 2018), as well as the differential associations of typologies with specified outcomes. This allows the examination of antecedents and consequences of adversities that occur in clusters, rather than the more widely used approach of examining associations between individual adverse experiences or simple cumulative measures (Nooner et al., 2010).

Trauma, mental health problems and intimate partner violence

Northern Ireland is a post-conflict region with a significant rate of trauma exposure (60.6%; Atwoli et al., 2015; Bunting et al., 2013; Karam et al., 2014; McLafferty et al., 2018) in the general population. The nature of trauma exposure among the general population in Northern Ireland has been described in a series of studies based on data derived from the World Health Organisation's (WHO) World Mental Health (WMH) Survey Initiative (Kessler et al., 2009). The WMH data indicated a 12-month prevalence of post-traumatic stress disorder (PTSD) of 5.1%, and a lifetime prevalence of 8.8% (Bunting et al., 2013). The prevalence of PTSD in Northern Ireland is higher than other conflict-affected countries such as Lebanon, Romania and Columbia (Karam et al., 2014). There is also high prevalence of other mental health problems in Northern Ireland; research on the WMH data identified a lifetime prevalence of 22.6% for anxiety disorders, and 18.8% for mood disorders (Bunting et al., 2012). The overall lifetime prevalence for any disorder was found to be 39.1%, and associations between mental health problems and exposure to the civil conflict in the region were identified (Bunting et al., 2012). These rates represent the highest level of mental illness in the UK by approximately 20-25%. Northern Ireland also has the UK's highest suicide rate (Betts & Thompson, 2017; Black & McKay, 2019; O'Neill, Heenan & Betts, 2019).

In Northern Ireland, the rate of domestic violence (violence perpetrated by a current or former intimate partner or other family member) has been generally increasing since record-keeping began (31,531 incidents between July 2018 and June 2019, an increase of 3% on the previous period; PSNI, 2019). This increase is likely to be partly due to increased reporting, however, evidence suggests that domestic violence is still an under-reported crime in Northern Ireland (Campbell & Rice, 2017; Doyle & McWilliams, 2018). Exposure to early maltreatment is a well-documented risk factor for perpetration of domestic violence (e.g. Dutton & Hart, 1992; Hastings & Hamberger, 1988; Maxfield & Widom, 1996; Rosenbaum & O'Leary, 1981; Tolman & Bennett, 1990; Widom, 1989;). More recent evidence indicates that other types of trauma, such as

community- and conflict-related violence, may also confer increased risk of perpetration (e.g. MacManus et al., 2012; Maguire et al., 2015; Orcutt, King & King, 2003; Semiatin et al., 2017; Taft et al., 2005;). Seemingly consistent with this, research conducted on a general criminal sample from Northern Ireland (Dalsklev et al., 2019) showed that having experienced trauma related to the civil conflict was associated with increased likelihood of violent re-offending post-release. A previous study on the present sample (Travers et al., 2020) identified an association between cumulative trauma exposure, substance abuse and perpetration of injurious or sexual intimate partner violence (IPV; a form of domestic violence that takes place between current or former intimate partners). If multiple traumas confer greater risk for more severe IPV perpetration, as the paper by Travers et al. (2020) suggests, then it is also important to generate insights into how trauma and adverse experiences co-occur, so that this process may be disrupted through intervention.

Research on the general population in Northern Ireland has suggested that trauma related to the political conflict and childhood adversities such as abuse and maltreatment frequently co-occur (O'Neill et al., 2015). Latent class analyses of the WMH data on the general population in Northern Ireland demonstrated such a co-occurrence and clustering of traumatic experiences across conflict and non-conflict related experiences among a high-risk sub-section of the population (McLafferty et al., 2015; McLafferty et al., 2016; O'Neill et al., 2015). Two latent class analyses were conducted on the WMH data (n = 1986); the first examining exposure to adversity in relation to suicidality (McLafferty et al., 2016), and the other examining adversity and psychopathology (McLafferty et al., 2015). McLafferty et al. (2016) identified a four-class solution, comprised of a baseline class (71.5%, with low probabilities of endorsing all types of traumatic experiences), a group with high levels of psychopathology and some exposure to childhood adversity (14.6%), a multi-trauma group with relatively high probabilities of endorsing both childhood and conflict-related adversities

(4.3%) and a group with high rates of conflict-related trauma, but lower rates of childhood adversities (9.6%). McLafferty et al. (2015), on the other hand, identified a three-class solution, comprised of a low-risk class (86%), a poly-adversity class (6.1%), and an economic adversity class (7.8%), with the two adversity classes each showing associations with specific categories of mental health problems.

The present study aims to explore how such patterns of trauma and adversity manifest in a sample of IPV perpetrators in Northern Ireland. Specifically, it will test the hypotheses that 1) adversity exposed classes similar to those identified by McLafferty et al. (2015; 2016) will be over-represented compared with the general population in Northern Ireland, while the baseline (low adversity) group will be under-represented and 2) the adversity-exposed classes will be associated with increased likelihood of presenting with the five categories of mental health problems (mood disorder, anxiety disorder, psychosis, neurodevelopmental disorder and personality disorder), controlling for the effects of age and substance abuse.

Method

Participants

The sample was extracted from the case files of the Probation Board of Northern Ireland (PBNI) between December 2018 and May 2019. In Northern Ireland, the PBNI is responsible for supervising perpetrators in the community and preparing incarcerated offenders for release. The PBNI's roles in this regard include ongoing assessments of offenders' level of risk, as well as providing group and individual interventions aimed at reducing likelihood to re-offend. Probation officers at the PBNI are social workers with a minimum qualification of an undergraduate degree. The PBNI provide two weeks of induction training to all newly recruited officers, which includes modules relating to substance abuse, trauma, mental health, and domestic violence. Additionally, PBNI psychologists regularly facilitate mandatory staff training in relation to areas of practice such as trauma-informed probation work, mental health and substance abuse, and domestic violence awareness and risk assessment. Probation officers also consult with psychologists on an ad-hoc basis to discuss queries or uncertainties about particular cases.

The data for the study were extracted from the PBNI electronic information management system, and the criteria for inclusion in the study were as follows: 1) over 18 years old and 2) enrolled in a PBNI IPV rehabilitation programme from 2009-2019. The final sample was comprised of 405 individuals (*Mean age* = 41.28, *SD*=10.28, *R*=24-73), all of whom were male, constituting 78% of the total population of enrolees in that time period (*N* = 519). Eligible participants were selected from a list in alphabetical order. Further demographic information on the sample is provided in Travers et al. (2020).

Measures

Adversity*:* The traumatic and adverse experiences were extracted from Assessment, Case Management and Evaluation forms (Gibbs, 1998). A version of the form specially adapted for use in Northern Ireland is periodically completed by PBNI probation officers for all clients, based on structured interviews. The completed form documents any significant trauma or adverse experiences of the offender. This qualitative information from the assessment forms was coded based on a list of adverse and potentially traumatic experiences, presented in Table 1. For each offender, whether each experience was either present (coded as 1) or absent (coded as 0), was recorded. These experiences include both trauma and adversity experienced before age 18, such as physical or sexual abuse, or witnessing domestic violence, as well as lifetime traumatic experiences, such as exposure to community violence or being mugged, threatened or attacked with a weapon in a non-domestic context.

<Insert Table 1>

Mental health**:** Five mental health variables were gathered: the probable mental health problems were categorised as 1) mood disorder, 2) anxiety disorder, 3) psychosis, 4) neurodevelopmental disorder and 5) personality disorder. Mental health information was also extracted from the PBNI assessment and case management forms. A mental health problem was coded as present only if the probation officer reported some form of supporting evidence, such as verification by a medical professional, receipt of medication or confirmation of a diagnosis by a family member. Substance abuse was coded as present if the probation officer had noted that either alcohol or drugs constituted a problem in the individual's life.

Analysis

Latent class analysis (LCA) was used to assess the co-occurrence of childhood and lifetime trauma and adversities. LCA is an explorative analytic method used to detect discrete

subpopulations within datasets, based on a given set of response patterns (Bandeen-Roche, 2016). In LCA, the clusters or 'classes' of response patterns are hypothesised to be governed by an underlying, or 'latent' variable. Selection of the best model is performed by assessing the fit statistics of a series of models with an increasing number of classes. The fit statistics used in the present analysis were the loglikelihood, the Akaike information criterion (AIC), the Bayesian information criterion (BIC), the sample-size adjusted Bayesian information criterion (SSBIC), entropy and likelihood-ratio test (LRT). These statistics were interpreted such that 1) larger loglikelihood values are preferable to smaller values, 2) smaller values on the AIC, BIC and SSABIC indicate better fit, 3) a higher entropy value (closer to a value of 1 indicates better fit, and 4) for the LRT, a non-significant value suggests that the model with one fewer classes better captures the data.

Following this, a series of hierarchical binary logistic regression models were estimated, assessing associations between the probable mental health problems (mood disorder, anxiety disorder, psychosis, neurodevelopmental disorder, personality disorder) and the latent trauma/adversity classes (1=childhood adversity, 2=community violence and disadvantage and 3=baseline). In the first step of the regression model, the trauma and adversity classes were specified as the multinomial independent variable, and in the second step, the control variables (age and substance abuse) were added, to allow examination of the unique effects of the trauma and adversity profiles while controlling for these additional factors.

The latent class analysis was conducted using Mplus version 8 (Muthén & Muthén, 2017) using the robust maximum likelihood estimator (MLR) and the regression analysis was conducted using SPSS 25 (IBM Corp, 2017).

Results

The rates of exposure to the adverse experiences are presented in Table 1. The most common adverse experiences in childhood were parental relationship breakdown (31.1%, *n* = 126), witnessing violence in the home (23.7%, *n* = 96) and parental substance abuse (22.2%, *n* = 90). The most common lifetime or adulthood experiences were experiencing a life-threatening accident or injury (20.7%, *n* = 84) the unexpected death of a loved one in adulthood (19%, *n* = 77), and being mugged or threatened with a weapon (16%, *n* = 65). The overall rate of exposure to traumatic or adverse experiences in the sample was 83.2% (*M* = 2.71, *SD* = 2.25).

Evidence of the presence of a mental health problem was recorded in 63.5% of case files. The most common category of mental health problems was mood disorders, such as depression or bipolar disorder (55.6%, *n* = 227), followed by anxiety disorders, such as generalised anxiety disorder or PTSD (30.1%, *n* =123) and psychosis (7.6%, *n* = 31). Evidence of a neurodevelopmental disorder was documented in 5.1% (*n* = 21) of the files, and 6.4% (*n* = 26) indicated probable presence of a personality disorder.

Latent class analysis

The fit statistics for the latent class analysis of trauma and adverse experiences are presented in Table 2.

>*Insert Table 2*<

Although there is some ambiguity in the fit statistics in relation to the suitability of the two or three class solution, the three-class model was ultimately selected. This selection was partially based on careful consideration of the qualitative substance and theoretical meaning of the classes. Additionally, the selection of the three-class solution is supported by the lower AIC and SSABIC values and by the higher entropy value.

The three-class solution is depicted in Figure 1. The first class in this model, characterising 32.9% of the sample, represents those individuals with high probabilities of endorsing childhood adversity, but lower probabilities of endorsing experiences likely to be related to the political conflict. This class will be referred to as the 'childhood adversity' class. Class 2, representing 7.9% of the sample, includes individuals with a relatively high probability of endorsing adverse experiences that are likely to be related to economic adversity, community violence and the political conflict, compared to the other classes in the model. Class 2 will be referred to as the 'community violence and disadvantage' class. The third class, representing the majority (59.2%) of the sample, was characterised by relatively low probability of endorsing all types of adverse experiences. This class will be referred to as the 'baseline' class.

>Insert Figure 1 and Table 3<

Binary logistic regression analyses

The latent classes were then analysed in a series of regression models to assess associations between the classes and the five categories of mental health problems. The results of the regression analyses are presented in Table 3. This analysis indicated that membership of the childhood adversity class was significantly associated with all categories of mental health problems (ORs = 1.77-3.25), apart from neurodevelopmental disorders, which became non-significant when the control variables were added. Membership of the community violence and disadvantage class was associated with evidence of mood and anxiety disorder (ORs 3.92 and 8.42, respectively), when controlling for the other variables in the model. Finally, younger age was significantly associated with evidence of anxiety and neurodevelopmental disorders.

It was not possible to control for the presence of substance abuse in all of the analyses, due to the presence of the problem of quasi-complete separation, owing to the very high overall rate of

substance abuse problems (87.7%) documented in the case files. Therefore, substance abuse could not be included as a control variable in the regression analysis with neurodevelopmental disorder as the dependent variable.

Discussion

This study aimed to explore classes of traumatic and adverse experiences among IPV perpetrators enrolled in behaviour change programmes in Northern Ireland, and the associations of those classes with mental health problems. The three-class solution that was selected as the best representation of the trauma and adversity data was characterised by the baseline (59.2%), community violence and disadvantage (7.9%) and the childhood adversity (32.9%) classes. These figures indicate support for hypothesis 1. McLafferty et al. (2015 and 2016) identified baseline (low adversity) classes of 86% and 71.5%, respectively. The present findings suggest that the low-exposure category was under-represented at 59.2%. The under-representation of the low-adversity category here suggests both higher levels of adversity and more complex presentation among perpetrators of IPV than in the general population in Northern Ireland. This corresponds with international literature documenting higher rates of trauma and the common occurrence of multiple and diverse trauma types among samples of partner violent men (e.g., Maguire et al., 2015; Semiatin et al., 2017).

The present findings in relation to the latent classes indicate potential ways in which different types of trauma and adversities may overlap and co-occur in Northern Ireland. Particularly of note in this respect is the elevated likelihood of adversities relating to economic disadvantage and community violence co-occurring in Class 2. Community factors here include adverse experiences which are potentially related to the post-conflict status of Northern Ireland, such as being attacked with weapons or experiencing non-domestic beatings. The co-occurrence of these types of community violence, alongside factors such as economic disadvantage, may reflect the increased vulnerabilities of disadvantaged communities in Northern Ireland to continuing victimisation by paramilitary elements in the post-conflict period (Alderice, McBurney & McWilliams, 2016). The community violence and disadvantage group was also likely to endorse some types of childhood

adversity, such as parental substance abuse, parental relationship breakdown, and other separation from parents, including being taken into care. This co-occurrence might indicate a contextual vulnerability to adverse childhood experiences conferred by the post-conflict environment of Northern Ireland. It may be the case that traumas relating to violence in the public sphere increase the risk of emotionally dysregulated behaviour within the home, as well as potentially harmful coping strategies such as substance use. Indeed, research from Northern Ireland (O'Neill et al., 2015) found that parents' exposure to conflict-related trauma was associated with harsh parenting, which in turn increased the likelihood of mental health problems in the next generation. In another study on a treatment-seeking sample (n = 81) from Northern Ireland (Dorahy et al., 2009), all of whom had experienced trauma relating to the political conflict, it was found that 95% of the sample also had a history of other trauma, such as childhood maltreatment. This may suggest that conflict-related trauma is likely to have a particularly serious impact on individuals who also had pre-existing trauma or early childhood adversity. This is consistent with international research which shows that trauma exposure is a risk factor for further trauma (Mitchell & Finkelhor, 2001), and that multiple trauma or 'poly-victimisation' predicts worse mental health outcomes (Finkelhor, Ormrod & Turner, 2007). International evidence also supports the hypothesis that public and private violence are interlinked, with several studies demonstrating increased occurrence and severity of IPV in conflict-affected regions including Liberia (Kelly et al., 2018), South Sudan (Murphy et al., 2019), Lebanon (Usta et al., 2008), Uganda (Annan & Brier, 2010) and Sri Lanka (Guruge et al., 2017).

The proportion of case files in the present sample recording probable mental health problems was high (63.5%). The lifetime prevalence for all mental health disorders in the general population in Northern Ireland has been estimated at 39.1% (Bunting et al., 2012). As expected, associations between the trauma classes and specific categories of mental health problems were

identified. The binary regression analyses found that all categories of mental health problems, apart from neurodevelopmental disorders, were associated with the childhood adversity class. The regression analyses also found that the community violence and disadvantage class was significantly associated with mood and anxiety disorders. and that anxiety disorders, including PTSD, were associated with the community violence and disadvantage class.

Previous research on the present sample did not find evidence that mental health problems acted as risk factors for injurious or sexual violence when controlling for factors such as substance abuse (Travers et al., 2020). However, the associations between mental health problems and trauma classes are nonetheless interesting and potentially useful from the perspective of screening and early intervention. For example, such information may be useful for the development of trauma-informed mental healthcare and other services. Trauma-informed services integrate an awareness and understanding of the nature of trauma and its impacts into all aspects of service design, referral and care (SAMHSA, 2014). Trauma-informed services may also act as points of entry for IPV screening. Additionally, although Travers et al. (2020) found no association between mental health problems and IPV perpetration in the present sample, certain patterns of trauma exposure and related mental health problems may confer risk in the general population. This may be a useful avenue for future research.

Overall, the present findings suggest that untreated trauma in Northern Ireland is associated with various societal problems such as IPV, substance use and mental health problems. Problems associated with trauma, addiction, poverty and mental health problems may manifest as problems of the criminal justice system in the absence of earlier intervention. Evidence in relation to the detrimental impact of exposure to multiple forms of trauma and adversity, coupled with the scale of IPV as a public health and human rights issue in Northern Ireland (e.g., PSNI, 2019) warrant increased focus on and investment in rehabilitative intervention. Early interventions targeting

factors such as poly-victimisation must also form a central pillar of preventive efforts, with a view to preventing the accumulation of risk factors, which, as the present research demonstrates, are likely to overlap and co-occur.

Limitations

Some limitations to the present study should be noted. The selective sample limits generalisability of the findings. Due to the way in which IPV was treated in the Northern Irish criminal code at the time when the data was gathered (i.e., without a specific IPV offence), sampling was based on enrolment to behavioural rehabilitation programmes. This creates a potentially confounding factor and limits generalisability to a wider range of offenders. It is also important to note that this sample may not be representative, for example, of incarcerated perpetrators, or of perpetrators in the community who have never come to the attention of the criminal justice system. Further research focusing on each of these samples in Northern Ireland is needed. However, we propose that the investigation into the present probation sample is an important endeavour in relation to prevention, given this sample's confirmed offending histories and the fact of their being situated in the community with potential opportunities to re-offend.

The trauma and adversity variables are based on self-reported data to probation officers, which may pose problems in relation to validity in the forensic environment. The cross-sectional data precludes establishing causality in relation to the associations under investigation. The use of categorical indicators, particularly for the measurements of mental health problems, means that these represent crude measures of the constructs under investigation. Standardised assessments of trauma and mental health problems, had they been available, would have been far preferable. The latent class regression analysis was conducted by dividing the sample according to their most likely

class membership. However, this method has significant limitations and constitutes a very simplified representation of the data which varies in descriptive accuracy between individuals.

The number of cases with evidenced diagnoses of psychosis, personality disorder and neurodevelopmental disorder in the sample were low. Similarly, the size of the community violence and disadvantage class reduces power to detect associations with that class that may have been present. The large confidence intervals for several of the estimates should also be taken into account from this perspective, and any conclusions to be drawn from this analysis should be understood as tentative. Further research based on primary data using validated measures of mental health problems will be needed to enhance confidence in the present findings.

Conclusions and implications

Despite its limitations, the present study provides information with potential for application to forensic and clinical intervention. For example, the present findings are of relevance to the literature on poly-victimisation. International research shows that experiencing trauma and victimisation predisposes individuals to further trauma (Mitchell & Finkelhor, 2001), and that poly-victimisation is predictive of worse mental health symptoms (Finkelhor, Ormrod & Turner, 2007). The community violence and disadvantage class, in particular, illustrates overlap between adverse experiences that are likely to be conflict-related, and other adversities such as economic disadvantage and some types of family malfunctioning. This appears to indicate a need for holistic community-based intervention, prior to criminal justice involvement, to target young people who may be at risk of criminal justice system involvement due to lack of opportunities. The high prevalence of membership of the ‘childhood adversity’ class also underlines the importance of early intervention targeting adverse childhood experiences (ACEs). Evidence suggests that experiencing four or more ACEs places children at an elevated risk of a range of adverse outcomes in adulthood,

including violence perpetration (Hughes et al., 2017; Hamby et al. 2021). Preventive interventions should target this accumulation of ACEs early in life through cross-sectoral trauma-informed practice. Trauma-informed practice can be beneficially integrated throughout a range of public services across a range of sectors including health and social work as well as justice (SAMHSA, 2014).

The factors described in the present study may constitute risks for the perpetration of IPV, and may also serve as treatment targets for incorporation into rehabilitative treatment programmes. However, as noted in Widom's (1989) seminal paper on the cycle of violence, most people who experience adversity do not go on to perpetrate violence in later life. More research is needed to examine the mechanisms of how and when factors such as trauma exposure act to increase risk, and how these factors can be effectively targeted in the context of rehabilitation.

The literature in relation to the effectiveness of trauma-informed intervention for preventing recidivistic IPV is still relatively young, although some approaches have demonstrated reductions in recidivism, at least in the shorter term (e.g., Pascual-Leone et al., 2011; Taft et al., 2016; Travers et al., 2021). Investigation into how to intervene in forensic settings in relation to different types of trauma, including whether different approaches may be more effective for individuals with distinct adversity profiles, may be a useful avenue for future research.

References

Alderice, J., McBurney, J. & McWilliams, M. (2016). *The Fresh Start Panel Report on the Disbandment of Paramilitary Groups in Northern Ireland*. Retrieved from https://cain.ulster.ac.uk/events/peace/stormont-agreement/2016-06-07_Fresh-Start-Panel_paramilitary-groups.pdf

Annan, J., & Brier, M. (2010). The risk of return: intimate partner violence in Northern Uganda's

armed conflict. *Social Science & Medicine, 70*(1), 152-159.

https://doi.org/10.1016/j.socscimed.2009.09.027

Atwoli, L., Stein, D. J., Koenen, K. C., & McLaughlin, K. A. (2015). Epidemiology of posttraumatic stress disorder: prevalence, correlates and consequences. *Current Opinion in Psychiatry,* 28(4), 307. doi: 10.1097/YCO.0000000000000167.

Armour, C., Elklit, A., & Christoffersen, M. N. (2014). A latent class analysis of childhood maltreatment: Identifying abuse typologies. *Journal of Loss and Trauma, 19*(1), 23-39. https://doi.org/10.1080/15325024.2012.734205

Ballard, E. D., Van Eck, K., Musci, R. J., Hart, S. R., Storr, C. L., Breslau, N., & Wilcox, H. C. (2015). Latent classes of childhood trauma exposure predict the development of behavioral health outcomes in adolescence and young adulthood. *Psychological Medicine, 45*(15), 3305-3316. doi:10.1017/S0033291715001300

Bandeen-Roche, K. (2016). *Latent Class Regression*. [PowerPoint presentation] retrieved from https://cdn1.sph.harvard.edu/wp-content/uploads/sites/59/2016/10/harvard-lecture-series-session-8_LCR.pdf

Barboza, G. (2018). Latent classes and cumulative impacts of exposure to adverse childhood experiences: how and why do interrelationships count? *Child Maltreatment, 23*(2), 111-125. DOI: 10.1177/1077559517736628

Betts, J. & Thompson, J. (2017). *Mental Health in Northern Ireland: Overview, Strategies, Policies, Care Pathways, CAMHS and Barriers to Accessing Services*. Report to the Northern Ireland Assembly. Retrieved from

http://www.niassembly.gov.uk/globalassets/documents/raise/publications/2016-2021/2017/health/0817.pdf

Black, L. & McKay, K. (2019). *Suicide Statistics and Strategy in Northern Ireland*. The Northern Ireland Assembly Research Matters Initiative. Retrieved from https://www.assemblyresearchmatters.org/2019/02/27/suicide-statistics-and-policy-in-northern-ireland/

Bunting, B. P., Ferry, F. R., Murphy, S. D., O'Neill, S. M., & Bolton, D. (2013). Trauma associated with civil conflict and posttraumatic stress disorder: evidence from the Northern Ireland study of health and stress. *Journal of Traumatic Stress*, 26(1), 134-141. https://doi.org/10.1002/jts.21766

Bunting, B. P., Murphy, S. D., O'Neill, S. M., & Ferry, F. R. (2012). Lifetime prevalence of mental health disorders and delay in treatment following initial onset: evidence from the Northern Ireland Study of Health and Stress. Psychological medicine, 42(8), 1727-1739. https://doi.org/10.1017/S0033291711002510

Campbell, P. & Rice, A. (2017). *Experience of Domestic Violence: Findings from the 2011/12 to 2015/16 Northern Ireland Crime Surveys*. Department of Justice Research and Statistical Bulletin 17/2017. Retrieved from https://www.justice-ni.gov.uk/sites/default/files/publications/justice/experience-of-domestic-violence-findings-201112-201516-northern-rreland-crime-surveys.pdf

Dalsklev, M., Cunningham, T., Travers, Á., McDonagh, T., Shannon, C., Downes, C., & Hanna, D. (2019). Childhood trauma as a predictor of reoffending in a Northern Irish probation sample. *Child Abuse & Neglect*, 97. 104168. https://doi.org/10.1016/j.chiabu.2019.104168

Dorahy, M. J., Corry, M., Shannon, M., MacSherry, A., Hamilton, G., McRobert, G., ... & Hanna, D. (2009). Complex PTSD, interpersonal trauma and relational consequences: Findings from a treatment-receiving Northern Irish sample. *Journal of Affective Disorders, 112*(1-3), 71-80. https://doi.org/10.1016/j.jad.2008.04.003

Doyle, J. & McWilliams (2018). *Intimate Partner Violence in Conflict and Post-Conflict Societies: Insights and Lessons from Northern Ireland*. Report from the Ulster University Transitional Justice Institute. Retrieved from https://blogs.sps.ed.ac.uk/politicalsettlements/files/2018/07/2018_PSRP-Violence-Report-NI.pdf

Dutton, D. G., & Hart, S. D. (1992). Evidence for long-term, specific effects of childhood abuse and neglect on criminal behavior in men. *International Journal of Offender Therapy and Comparative Criminology, 36*(2), 129-137. https://doi.org/10.1177/0306624X9203600205

European Union Agency for Fundamental Rights, (2014). *Violence against Women: an EU-wide Survey. Results at a Glance*. Luxembourg: Publications Office of the European Union.

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine, 14*(4), 245-258. https://doi.org/10.1016/S0749-3797(98)00017-8

Finkelhor, D., Ormrod, R. K., & Turner, H. A. (2007). Polyvictimization and trauma in a national longitudinal cohort. *Development and Psychopathology, 19*(1), 149-166. DOI: https://doi.org/10.1017/S0954579407070083

Gibbs, A. (1998). *The Assessment, Case Management and Evaluation System (ACE): Some Applications and Initial Data from Five Probation Services in the UK*. University of Oxford, Probation Studies Unit; Warwickshire Probation Service.

Guruge, S., Ford-Gilboe, M., Varcoe, C., Jayasuriya-Illesinghe, V., Ganesan, M., Sivayogan, S., ... & Vithanarachchi, H. (2017). Intimate partner violence in the post-war context: Women's experiences and community leaders' perceptions in the Eastern Province of Sri Lanka. *PloS One, 12*(3), https://doi.org/10.1371/journal.pone.0174801

Hamby, S., Elm, J. H., Howell, K. H., & Merrick, M. T. (2021). Recognizing the cumulative burden of childhood adversities transforms science and practice for trauma and resilience. *American Psychologist, 76*(2), 230. https://doi.org/10.1037/amp0000763

Hastings, J. E., & Hamberger, L. K. (1988). Personality characteristics of spouse abusers: A controlled comparison. *Violence and Victims, 3*(1), 31-48. DOI: 10.1891/0886-6708.3.1.31

Hughes, K., Bellis, M. A., Hardcastle, K. A., Sethi, D., Butchart, A., Mikton, C., ... & Dunne, M. P. (2017). The effect of multiple adverse childhood experiences on health: a systematic review and meta-analysis. *The Lancet Public Health, 2*(8), e356-e366. https://doi.org/10.1016/S2468-2667(17)30118-4

IBM Corp. (2017). IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp.

Karam, E. G., Friedman, M. J., Hill, E. D., Kessler, R. C., McLaughlin, K. A., Petukhova, M., ... & De Girolamo, G. (2014). Cumulative traumas and risk thresholds: 12-month PTSD in the World Mental Health (WMH) surveys. *Depression and Anxiety*, 31(2), 130-142. https://doi.org/10.1002/da.22169

Kelly, J. T., Colantuoni, E., Robinson, C., & Decker, M. R. (2018). From the battlefield to the bedroom: a multilevel analysis of the links between political conflict and intimate partner violence in Liberia. *BMJ Global Health, 3*(2), http://dx.doi.org/10.1136/bmjgh-2017-000668

Kessler, R. C., Aguilar-Gaxiola, S., Alonso, J., Chatterji, S., Lee, S., Ormel, J., ... & Wang, P. S. (2009). The global burden of mental disorders: an update from the WHO World Mental Health (WMH) surveys. *Epidemiology and Psychiatric Sciences*, 18(1), 23-33. DOI: https://doi.org/10.1017/S1121189X00001421

MacManus, D., Rona, R., Dickson, H., Somaini, G., Fear, N., & Wessely, S. (2015). Aggressive and violent behavior among military personnel deployed to Iraq and Afghanistan: prevalence and link with deployment and combat exposure. *Epidemiologic Reviews, 37*(1), 196-212. https://doi.org/10.1093/epirev/mxu006

Maguire, E., Macdonald, A., Krill, S., Holowka, D. W., Marx, B. P., Woodward, H., ... & Taft, C. T. (2015). Examining trauma and posttraumatic stress disorder symptoms in court-mandated intimate partner violence perpetrators. *Psychological Trauma: Theory, Research, Practice, and Policy*, 7(5), 473. https://doi.org/10.1037/a0039253

Maxfield, M. G., & Widom, C. S. (1996). The cycle of violence: Revisited 6 years later. *Archives of Pediatrics & Adolescent Medicine, 150*(4), 390-395. doi:10.1001/archpedi.1996.02170290056009

McLafferty, M., Armour, C., McKenna, A., O'Neill, S., Murphy, S., & Bunting, B. (2015). Childhood adversity profiles and adult psychopathology in a representative Northern Ireland study. *Journal of Anxiety Disorders*, 35, 42-48. https://doi.org/10.1016/j.janxdis.2015.07.004

McLafferty, M., Armour, C., O'Neill, S., Murphy, S., Ferry, F., & Bunting, B. (2016). Suicidality and profiles of childhood adversities, conflict related trauma and psychopathology in the Northern Ireland population. Journal of Affective Disorders, 200, 97-102. doi: 10.1016/j.jad.2016.04.031

McLafferty, M., O'Neill, S., Armour, C., Murphy, S., Ferry, F., & Bunting, B. (2018). The impact of childhood adversities on the development of Posttraumatic Stress Disorder (PTSD) in the Northern Ireland population. *European Journal of Trauma and Dissociation*. doi: 10.1016/j.ejtd.2018.05.001

Mitchell, K. J., & Finkelhor, D. (2001). Risk of crime victimization among youth exposed to domestic violence. *Journal of Interpersonal Violence, 16*(9), 944-964. https://doi.org/10.1177/088626001016009006

Murphy, M., Bingenheimer, J. B., Ovince, J., Ellsberg, M., & Contreras-Urbina, M. (2019). The effects of conflict and displacement on violence against adolescent girls in South Sudan: the case of adolescent girls in the Protection of Civilian sites in Juba. *Sexual and Reproductive Health Matters, 27*(1), https://doi.org/10.1080/26410397.2019.1601965

Muthén, L.K. and Muthén, B.O. (1998-2017). Mplus User's Guide. Eighth Edition. Los Angeles, CA: Muthén & Muthén.

Nooner, K. B., Litrownik, A. J., Thompson, R., Margolis, B., English, D. J., Knight, E. D., Everson, M. D., & Roesch, S. (2010). Youth self-report of physical and sexual abuse: A latent class analysis. *Child Abuse and Neglect, 34*(3), 146–154. doi:10.1016/j.chiabu.2008.10.007

O'Neill, S., Armour, C., Bolton, D., Bunting, B., Corry, C., Devine, B., Ennis, E., Ferry, F., McKenna, McLafferty, M., Murphy, S. (2015). *Towards A Better Future: The Trans-*

generational Impact of the Troubles on Mental Health. Belfast: Commission for Victims and Survivors.

O'Neill, S., Heenan, D. & Betts, J. (2019). *Review of Mental Health Policies in Northern Ireland: Making Parity a Reality*. Report retrieved from https://docs.wixstatic.com/ugd/198ed6_e5c1efcade6e427ba54de34a30db488b.pdf

Orcutt, H. K., King, L. A., & King, D. W. (2003). Male-perpetrated violence among Vietnam veteran couples: relationships with veteran's early life characteristics, trauma history, and PTSD symptomatology. *Journal of Traumatic Stress, 16*(4), 381-390. DOI:10.1023/A:1024470103325

Pascual-Leone, A., Bierman, R., Arnold, R., & Stasiak, E. (2011). Emotion-focused therapy for incarcerated offenders of intimate partner violence: A 3-year outcome using a new whole-sample matching method. *Psychotherapy Research, 21*(3), 331-347. doi: 10.1080/10503307.2011.572092

Police Service of Northern Ireland (PSNI) 2019. *Domestic Abuse Incidents and Crimes Recorded by the Police in Northern Ireland: Update to 30 June 2019.* Retrieved from https://www.psni.police.uk/globalassets/inside-the-psni/our-statistics/domestic-abuse-statistics/2019-20/domestic-abuse-bulletin-jun-19.pdf

Rosenbaum, A., & O'Leary, K. D. (1981). Marital violence: Characteristics of abusive couples. *Journal of Consulting and Clinical Psychology*, *49*(1), 63. https://doi.org/10.1037/0022006X.49.1.63

Substance Abuse and Mental Health Services Administration [SAMHSA]. *SAMHSA's Concept of Trauma and Guidance for a Trauma-Informed Approach*. HHS Publication No.

(SMA) 14-4884. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2014.

Semiatin, J. N., Torres, S., LaMotte, A. D., Portnoy, G. A., & Murphy, C. M. (2017). Trauma exposure, PTSD symptoms, and presenting clinical problems among male perpetrators of intimate partner violence. *Psychology of Violence*, 7(1), 91. DOI: 10.1037/vio0000041

Taft, C. T., Macdonald, A., Creech, S. K., Monson, C. M., & Murphy, C. M. (2016). A randomized controlled clinical trial of the Strength at Home men's program for partner violence in military veterans. *The Journal of Clinical Psychiatry*, *77*(9), 1168-1175. doi: 10.4088/JCP.15m10020

Taft, C. T., Pless, A. P., Stalans, L. J., Koenen, K. C., King, L. A., & King, D. W. (2005). Risk factors for partner violence among a national sample of combat veterans. *Journal of Consulting and Clinical Psychology*, *73*(1), 151. https://doi.org/10.1037/0022006X.73.1.151

Tolman, R. M., & Bennett, L. W. (1990). A review of quantitative research on men who batter. *Journal of Interpersonal Violence*, *5*(1), 87-118. https://doi.org/10.1177/088626090005001007

Travers, Á., McDonagh, T., Cunningham, T., Armour, C., & Hansen, M. (2021). The effectiveness of interventions to prevent recidivism in perpetrators of intimate partner violence: A systematic review and meta-analysis. *Clinical Psychology Review*, 101974.

Travers, Á., McDonagh, T., Cunningham, T., Dalsklev, M., Armour, C., Hansen, M. (2020). Trauma exposure and offending severity in a probation sample from post-conflict Northern Ireland. *Journal of Interpersonal Violence*, 1-20. DOI: 10.1177/0886260520922355

Usta, J., Farver, J. A. M., & Zein, L. (2008). Women, war, and violence: surviving the experience.

Journal of Women's Health, 17(5), 793-804. https://doi.org/10.1089/jwh.2007.0602

Widom, C. S. (1989). The cycle of violence. *Science, 244*(4901), 160-166. DOI: 10.1126/science.2704995

Wolff, K. T., Cuevas, C., Intravia, J., Baglivio, M. T., & Epps, N. (2018). The effects of neighborhood context on exposure to adverse childhood experiences (ACE) among adolescents involved in the juvenile justice system: latent classes and contextual effects. *Journal of Youth and Adolescence, 47*(11), 2279-2300. https://doi.org/10.1007/s10964-018-0887-5

World Health Organization (2020). *International statistical classification of diseases and related health problems (11th ed.)*. https://icd.who.int

Table 1: Frequency of the twenty-four adverse experiences

	Adverse experience	%	(*n*)
Childhood (before age 18)	Parent relationship breakdown	31.1	(126)
	Witnessed domestic violence	23.7	(96)
	Parent substance abuse	22.2	(90)
	Separation from parent e.g. taken into care	17.0	(69)
	Physical abuse	15.8	(64)
	Other childhood trauma	11.9	(48)
	Economic adversity	11.4	(46)
	Death of a parent	9.4	(38)
	Neglect or emotional abuse	9.1	(37)
	Sexual abuse	7.4	(30)
	Death of another close person pre-18	6.4	(26)
	Parent mental health problem	3.0	(12)
	Parent criminal behaviour	2.5	(10)
Lifetime exposure	Life-threatening accident, illness or injury	20.7	(84)
	Unexpected death of a loved one (adulthood)	19.0	(77)
	Mugged or threatened with a weapon e.g. paramilitary threats to life	16.0	(65)
	Beaten by someone other than a parent or partner (e.g. paramilitary beating)	10.4	(42)
	Attacked with a gun, knife or other weapon	7.7	(31)
	Experienced domestic violence (adulthood)	7.2	(29)
	Combat experience	7.2	(29)
	Son or daughter with life-threatening illness or injury	4.0	(16)
	Witnessed death or injury	3.0	(12)
	Ever trauma to someone close	2.2	(9)
	Witnessed atrocities	1.5	(6)

Table 2: Fit statistics for trauma and adversity classes

Model	**Loglikelihood**	**AIC**	**BIC**	**SSABIC**	**Entropy**	**LRT (p-value)**
1-class	-3101.00	6254.00	6357.65	6275.15	-	-
2-class	-2949.59	6005.19	6216.47	6048.30	.78	300.95 (.00)
3-class	**-2908.54**	**5977.07**	**6295.99**	**6042.14**	**.83**	**81.61 (.17)**
4-class	-2874.28	5962.56	6389.11	6049.59	.80	68.09 (.50)
5-class	-2841.69	5951.37	6485.55	6060.37	.90	64.79 (.17)
6-class	-2810.34	5942.68	6584.50	6073.64	.92	62.97 (.03)

Notes: AIC = Akaike information criterion, BIC= Bayesian information criterion, SSBIC= sample-size adjusted Bayesian information criterion, LRT= Lo-Mendell-Rubin Adjusted Likelihood Ratio Test

Figure 1: Graph of the three-class solution

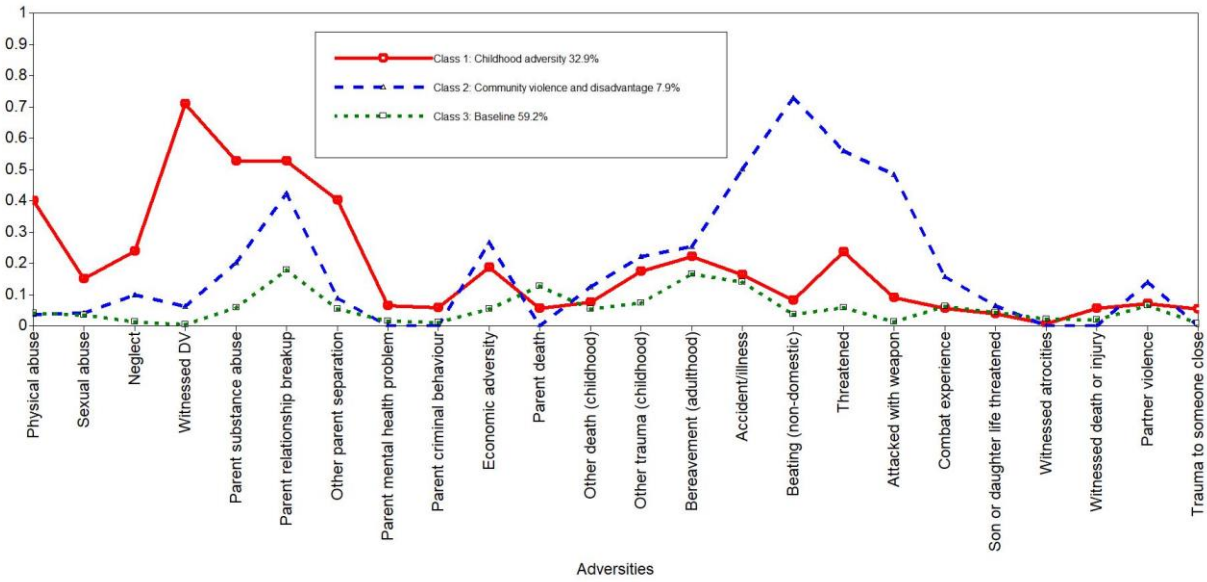

Table 3: Hierarchical binary logistic regression analyses of associations between trauma and adversity classes and mental health problems

		Mood disorder		Anxiety disorder		Psychosis		Personality disorder		Neurodevelopmental disorder	
		OR (95% CI)	*p*	OR 95% CI	*p*	OR 95% CI	*p*	OR 95% CI	*p*	OR 95% CI	*p*
Step 1	Childhood adversity	**2.52 (1.57-4.00)**	**<.001**	**1.93 (1.19-3.12)**	**.007**	**3.51 (1.54-8.01)**	**.003**	**2.55 (1.07-6.09)**	**.035**	**2.99 (1.11-8.07)**	**.031**
	Community violence and disadvantage	**4.07 (1.60-10.36)**	**<.001**	**8.33 (3.48-19.98)**	**<.001**	2.69 (.69-10.42)	.153	.83 (.01-6.71)	.826	3.84 (.93-15.80)	.062
Step 2	Childhood adversity	**2.56 (1.59-4.11)**	**<.001**	**1.77 (1.09-2.88)**	**.022**	**3.25 (1.41-7.49)**	**.006**	**2.56 (1.05-6.25)**	**.038**	2.46 (.89-6.80)	.082
	Community violence and disadvantage	**3.92 (1.53-10.03)**	**.004**	**8.42 (3.45-20.51)**	**<.001**	2.41 (.62-9.39)	.205	.74 (.09-6.05)	.781	3.83 (.88-16.69)	.074
	Age	1.01 (.99-1.03)	.265	**.97 (.95-1.00)**	**.017**	.99 (.95-1.03)	.618	1.01 (.97-1.06)	.509	**.89 (.83-.96)**	**.003**
	Substance abuse	.76 (.40-1.44)	.401	.78 (.36-1.66)	.512	.30 (.04-2.33)	.304	.34 (.04-2.63)	.303	n/a	n/a