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Trajectories of intimate partner violence (IPV) in a primary care cohort of women with depressive symptoms

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Introduction

Intimate partner violence (IPV) is a global prevalent public health issue, with one in three
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women experiencing physical or sexual violence by a male partner (World Health Organization, 2013a). IPV causes major ill health for women and their children who are exposed to IPV, mainly from the associated mental health burden of disease (Garcia- Moreno et al, 2014; World Health Organization, 2013a). Systematic reviews have shown the close association of IPV with mental health disorders, in particular depression (Oram et al, 2013). Thus, the World Health Organization generally recommends health professionals provide a supportive first line response to disclosure of IPV and specific psychological therapy for women who are no longer experiencing IPV (WHO, 2013). Further, a systematic review of psychological therapies for women experiencing IPV shows that therapies improved depressive symptoms (Hameed et al, 2020).

However, it might be important for health professionals to be able to identify women likely to experience over time different trajectories of IPV to enable a tailored response to different women's jouneys of IPV. For example, different socio-demographic characteristics when women first present to health services, might indicate the greater likelihood that a partner is able to perpetrate ongoing severe IPV because of an individual woman's lack of resources such as finances, education, employment or connection to social networks (Beeble et al, 2009) (Ogbe et al, 2020). All these factors as well as age (women of a younger age (<50 years)) and being separated or divorced (abuse from an ex-partner) have been shown to be associated with IPV (Garcia- Moreno et al, 2014; World Health Organization, 2013a, Hegarty et al, 2012). However, we know little about the associations of trajectories of abuse over time with these socio-demographic factors. Further, we need to understand whether women who stop experiencing IPV by their partners are less likely to experience depression compared with those women who continue to experience IPV in relationships as this is an important clinical question.

The relationship between depression and IPV has largely been studied in cross-sectional studies, with researchers debating the direction of the association between the two phenomenon (Beydoun et al, 2012; Trevillion et al, 2012). It seems obvious to many researchers that experience of IPV is causally related to subsequent depression (Tsai, 2013) (Gilchrist et al, 2010). In favour of the hypothesis that women's experience of IPV results in later depression is evidence showing that the more a woman experiences severe violence, the greater that individual experiences severe depression (Rees et al, 2011) (Golding, 1999) (World Health Organization, 2013a). However, it is possible that women experiencing depression feel powerless to enact any changes in their relationship, which enables partners to use ongoing IPV tactics (Ehrensaft et al, 2006; Tsai, 2013) (Filson et al, 2010). In addition, Tsai (Tsai, 2013) proposed a model where IPV and depression interrelate with gendered norms that underlie the use of IPV, biological differences in physical strength of partners and the risk factor of poverty (associated with both IPV and depression). He further suggests that there are common risk factors for experience of IPV and depression such as child abuse that may complicate analyses as there is strong evidence that child abuse is associated with women's experience of IPV and depression (Capaldi et al, 2014).

There have been limited longitudinal studies exploring the links between experience of IPV and depression disorders, particularly in primary care (Hegarty et al, 2013) (Zink et al, 2005). A systematic review (Devries et al, 2013) of 16 longitudinal studies of IPV and depression showed experience of IPV was associated with incident depressive symptoms and also the reverse that depressive symptoms were associated with incident experience of IPV. However, these studies exploring the direction of the association were limited in that they did not adjust for depression or childhood abuse at the beginning of the studies. In addition, there has been limited examination of how experience of IPV and depression changes over time in clinical populations,

and none from women attending a primary care population (Hegarty et al, 2004) (Gilchrist et al, 2010). Trajectory studies of IPV following the path of individual's experiences over time have mainly been done on community populations (Groves et al, 2014; Swartout et al, 2012) or male perpetrators of IPV (Jones et al, 2010) and have not looked at mental health issues (Walsh et al, 2012). Primary care populations, although similar to community populations to some extent, are representative of the sub-population of people who attend such a clinical setting and are able to answer questions about clinical characteristics associated with IPV.

The aim of this study was to explore women's different experiences of IPV over time (trajectories) from a cohort of women who screened positive for depressive symptoms, attending primary care. Secondly, to determine baseline factors (age, managing on income, marital status, employment, number of social supports, health status) that might differentiate women who follow different paths of experience of IPV from their partners. These baseline factors and follow up variables were chosen a priori based on the evidence of common risk factors (Capaldi et al, 2014) and outcomes (World Health Organization, 2013a)(Hegarty et al, 2012) (Black, 2011). Finally, we explored associations with follow up measures at four years of quality of life, mental health, health service use and social support for the different IPV trajectory groups of women's experiences. We hypothesised that there would be women who remain exposed to high levels of IPV and others who reduce exposure over the four years and that baseline risk factors would differentiate these trajectories. Those groups who had continued exposure to IPV we expected to have poor mental health, low quality of life and poor social support at follow up at four years compared to those with reduced or no exposure.

Method

Participants

We undertook a secondary analysis of baseline data (March, 2006) to four year data from a large cohort study in general practice (Gunn et al, 2008) which explored depressive symptoms over time and patients' use of health services (Gunn et al, 2013). Detailed methods including sample size calculations, recruitment processes and cohort description are described elsewhere (Gunn et al, 2013). Participants were 563 women from 30 general practices in the state of Victoria, Australia who in a mailed screening survey (of consecutively attending patients) recorded a score of 16 or more on the Center for Epidemiologic Studies Depression Scale (CES-D) (Radloff, 1977). Of these, 555 reported having had an adult intimate relationship, with 548 completing the Composite Abuse Scale (CAS) (Hegarty et al, 1999) at different time points. Postal surveys and structured Computer Assisted Telephone Interviews (CATIs) administered by trained research assistants were completed at baseline, 12, 24, 36, and 48 months.

Materials and procedure

IPV was measured in the surveys using the Composite Abuse Scale (CAS) (Hegarty et al, 1999), a widely used and well validated 30 item scale that measures physical, emotional and sexual abuse by a partner or ex-partner in the last 12 months. A score greater than or equal to 7 is classified as positive for IPV (Hegarty et al, 2005). Diagnostic assessment of depression (DSM-IV and ICD-10) were conducted using the Composite International Diagnostic Interview (CIDI) (World Health Organisation, 1997). In the surveys, the PRIME-MD Patient Health Questionnaire (PHQ) was used to assess participant's depression, panic and anxiety levels (Spitzer et al, 1999) and CES-D was used to measure depressive symptoms (Radloff, 1977). The Child Maltreatment History Self-Report (MacMillan et al, 1997) was used to measure child abuse giving categories of severe physical abuse (often kicked or hit with something, any episode of choked, physically attacked in some other way) and severe sexual abuse (threatened to have sex, touched sex parts of the body, tried to sex or sexually attacked). Surveys also had demographic measures of age, managing on available income (easily/not too bad/difficult some of the time/ difficult all of the

time), pension/benefit, marital status, and employment. Other measures included health status (SF-12) (Ware et al, 1996), long term illness or disability (yes/no), quality of life scale (WHOQoL) (Skevington et al, 2004), health service use and social support- number of support people available out of a possible score of nine (Sarason et al, 1978).

There were five assessments using the Composite Abuse Scale (CAS) from baseline to four years. Overall, 548 females completed CAS across multiple data collection time points with the majority (51%) answering CAS items at all timepoints and 70% of females completed CAS items at least at three time points between baseline and 48 months. There was no significant baseline difference between missings at 48 months (sociodemographic characteristics, mental health, abuse levels), except more women (21%) with missing data were born outside Australia compared to 14% for women with completed CAS. Overall, 80% (N=443) of participants contributed to two or more completions of the Composite Abuse Scale.

Initial data analyses were conducted using STATA Version 12.1(StataCorp., 2011) to describe baseline participant characteristics. The subsequent data analyses used Mplus statistical software (Muthén & Muthén, 2004) and comprised two steps: (a) growth mixture modelling (GMM) utilising all CAS scores as a continuous measure at each time point to identify naturally occurring groups based upon CAS sub-class trajectory and classify women into subgroups based on the similarity of symptom levels over time (Muthen & Muthen, 2000) and (b) to test for differences between sub-groups on a number of baseline socio-demographic and four year outcome measures to determine whether women with particular characteristics were more or less likely to follow a particular latent trajectory class. This method has been used with this same cohort for the first year of trajectory of depression symptoms (Gunn et al, 2013) All cases including those with missing data for various time points were included in the estimation of model parameters using full information maximum likelihood estimation of parameters (Enders

& Bandalos, 2001). GMM deliberately assumes a non-normal distribution or, more accurately, a multi-normal distribution classifying individuals into subgroups (i.e., the 5 classes) of normal distributions. For each relatively heterogeneous sub-group two latent parameters were estimated to describe a trajectory for changes in outcome measures over time, conceptually the same as a simple regression line- the intercept (i.e., the estimated baseline score) and slope (i.e., the estimated change over time) of the trajectory for each sub-group. For our modelling purposes, we investigated standard quadratic trajectories, defined by $CAS = I + X_1 \times Year + X_2 \times Year^2$(Where: *CAS* is the predicted CAS, *I* is the predicted intercept, *X* is the time in years, and X_1 = Parameter for the linear and X_2 = Parameter for the quadratic term. We have reported the model fit statistic the Bayesian Information Criterion (BIC) (Kass & Rafferty, 1993). In addition to model fit statistics, we imposed a further criterion that models with a very small number of sub-group numbers (<10) in one or more sub-groups were unacceptable.

Baseline characteristics were summarised using percentages for categorical variables and means and standard deviations for continuous variables. Baseline and four-year sub-groups differences were summarised using percentages and standard errors (SE) for categorical measures and means and standard errors for continuous measures. Baseline and four-year means and percentages for sub-groups were compared with each other following the identification of the number of sub-groups in the best fitting model. To handle missing data, post hoc group differences were measured using pairwise equality tests of means across classes using posterior probability-based multiple imputations with one degree of freedom (Croiseau & Genin, 2007). In line with usual practice in GMM and where it made practical sense, we treated ordinal variables as if they were continuous.

Results

Baseline characteristics showed the majority of participants had English as a first language (95.8%), were employed or a student (61.5%), and had difficulty managing on available income (58.3%). Their mean age was 47 years (SD 13) and half of the participants were married (48.9%). Two thirds of the participants reported good or excellent health (65.1%) and just under half, (44%) had a long-term illness or disability. The mean number of supporters was three. With regard to abuse and mental health history, 42.2% of women scored as experiencing IPV (CAS>7) in the past 12 months, 39.5% had a past history of severe child sexual abuse and 25% had experienced major depression.

Table 1 presents from one to six possible models of subgroups of IPV trajectories based on the CAS participant scores. Each model has the number of patients in each group, the BIC statistics and the model parameter estimates. We selected the five-class model as the best fitting model with the lowest BIC (1738.22) and an entropy of 0.809 of being correct (see Figure 1). The 'no IPV' group (60%, 329) had CAS scores of zero over the four-year period. The 'minimal IPV' group (9%, 52) had consistently minimal scores on the CAS and the 'some IPV' group (14%, 77) had moderate CAS scores. The 'decreasing IPV' group (11% 62), had relatively high CAS scores initially but improved substantially to not scoring on the CAS over the four-year period. The 'high IPV' group (5%, 28) had high CAS Scores at baseline and improved slightly for two years, thereafter worsening to a higher level CAS Score at four years. Thus, only in one group IPV went down, and in all others, it stayed around the same level of severity.

Table 1 here

Figure 1 here

The Average Latent Class Probabilities for Most Likely Class Membership is presented in Table 2. Class probabilities (diagonal) for this model range between 0.698 and 0.949 showing that classes are distinct and model accurately predicts class membership for participants (B. O. Muthén & Muthén, 2000). 'None' trajectory class is the most distinct class and 'Decreasing' trajectory group is reducing the entropy the most.

Table 2 here

Differences between the five sub-groups are presented for baseline (Table 3) and four years (Table 4) for selected continuous and categorical variables.

Table 3 here

Baseline Differences

The main differences at baseline can be seen between the consistently 'high IPV' and the 'no/minimal IPV' groups. These groups differ on baseline factors with the 'high IPV' group having greater difficulty managing on income, more likely to have been separated and divorced, and to have experienced severe child sexual and physical abuse. The 'high IPV' group also had significantly lower baseline levels of quality of life, higher levels of mental health issues (panic or anxiety syndrome on PHQ, high CESD and PHQ mean scores) and physical health issues (poor or fair self-rated health, more physical disability) and lower social support. Participants with consistently 'high or some' level of IPV over the four years were more likely at baseline to have major depression (PHQ) compared to the 'no IPV' group. At baseline, the 'decreasing IPV' group was significantly different from the 'no IPV' groups on difficulty managing on available income, being separated or divorced, poorer quality of life and more mental health

issues (global mental health (SF-12), CES-D and PHQ mean scores). No significant differences were found between the trajectory groups in terms of participants' age, education, or employment.

Table 4 here

Four Year Differences

The main differences between the groups observed in the fourth year compared with baseline is that generally the 'decreasing IPV' group had moved to be aligned with the 'minimal or no IPV' groups rather than the consistently 'high or some IPV' groups. The consistently 'high IPV' group and the lower trajectory IPV groups ('decreasing', 'minimal' and 'no') differed on all major variables at four years. This included not managing on available income, poorer quality of life, higher mental health issues (major depressive, panic or anxiety syndrome on PHQ, DSMIV any depression, CESD and PHQ mean scores), poorer physical health issues (self-rated health, physical health status (SF-12), long term illness/disability) and lower social support. The 'some IPV' group remained aligned with the 'high IPV' group with differences to the 'no IPV' group on the variables of difficulty managing on income, poorer quality of life, more mental health issues (major depressive syndrome on PHQ), poorer physical health issues (long term illness/disability) and lower social support. The 'high IPV' group was the only group associated with CIDI diagnosed depression and PHQ panic or anxiety at four years. The 'high IPV' group differed significantly from other groups on health service use, with more visits to a mental health professional ('some, decreasing and no IPV' groups) and 12 or more visits to a GP in the last 12 months ('minimal and no IPV' groups).

Discussion

This is the first trajectory study in primary care of depressed women's experiences of IPV over time. Similar to other work in a college population (Swartout et al, 2012) this study shows that over a four year period women's abuse by their partner either stays at the same level (high or some or minimal or none IPV) and only one group of women were classed as associated with decreasing IPV. This mirrors women's experiences narrated in qualitative studies (Feder et al, 2006) where there is a lengthy pathway to safety as women navigate their way through the health and service system (Tarzia et al, 2020). However, there were no particular demographic predictors that identified which pathway women's experience from their partner would follow, contrary to our hypothesis. Baseline associations with IPV were similar to other cross-sectional work (World Health Organization, 2013a) with women from all IPV trajectory groups more likely to be separated or divorced, have poorer mental health and physical health including disabilities, low social support and low financial means compared to those with no IPV (World Health Organization, 2013a). Similar to other studies, it is the fundamental experience of being a woman (rather than any particular demographic characteristics) that resulted in their partner's use of IPV (Jonas et al, 2014). Similar to another trajectory study (Swartout et al, 2012), women's experience of severe child sexual or physical abuse was more likely associated with persistent IPV over the four years. Similar to other research, (Rees et al, 2011) the interrelationship between accumulative trauma is highlighted with the links between severe childhood abuse and high levels of ongoing IPV. Overall, we could not identify who is more likely to follow a particular path of experience of IPV from their partners to tailor care over time.

As we hypothesised, the consistently 'high IPV' group (who also had high childhood abuse) had a high burden of disease and service use remaining at four years. As other research reveals, (Rees et al, 2011) ongoing high levels of abuse during a woman's lifetime was associated with poor physical and mental health, greater difficulty managing on income, and low social support. Further, most of this group were separated or divorced, with the abuse likely to be perpetrated by

ex-partners or by a subsequent current partner. In contrast, women who four years later had stopped experiencing IPV appeared to have an improved situation with less anxiety or panic disorder or depression, less difficulty managing on income and a greater number of social supports compared with women experiencing persistent levels of IPV.

In summary, this analysis showed that women's health, social support and financial situations can improve if they stop experiencing IPV, even if they have experienced child abuse. Conversely ongoing abuse by a partner has an increasingly negative effect not just on mental health and quality of life but also physical health (Brown et al, 2008). An alternative explanation may be those who are more depressed may be less able to leave abusive partners due to lower self-efficacy (Filson et al, 2010).

Limitations of this study include that the sample analysed are from a unique single cohort of English-speaking women scoring positive for depressive symptoms at entry into the study (who also had high rates of childhood sexual abuse). Further, women entering the study already had depressive symptoms and some had experience of IPV, which makes it difficult to conclude pathways beyond the four-year snapshot. One third of participants missed answering the CAS at three or more time points. This is less relevant when the analyses are exploring associations and trajectories. Additionally, it is not possible even with this prospective study to establish the direction of causality regarding IPV and depression. We did not analyse for confounders such as child abuse, rather we determined whether women with specific characteristics (including child physical and sexual abuse but not emotional abuse and neglect) were likely to follow a particular latent trajectory class. We did not measure all aspects of risk factors (eg. housing stability, ethnicity) or outcomes (eg. legal service use, effect on children).

Because this analysis did not take into account the uncertainty in class assignment and the entropy measuring overall likelihood of class membership is below 0.9, the model results need to be treated with caution. Further, because sample sizes for the five classes are different (ranging from 28 to 329) the significance levels need to be treated with some caution. Strengths of the study include the large sample size, the reasonable response rate, the well validated measure used to measure IPV, the innovation of the use of GMM as a tool to identify trajectories of IPV and deal with missing data, and the inclusion of child abuse measures and baseline depression in the analyses.

The implications for practice include that the findings that women's mental health improves after IPV decreases may help those health practitioners who often feel frustrated and overwhelmed that women may not be able to recover from IPV even when IPV has decreased (Sugg et al, 1999) (Sprague et al, 2012) (Hegarty et al, 2020). Women disclosing child physical or sexual abuse, should raise an alert for health practitioners to ask about IPV, if we are to intervene early in the ongoing connection between historical trauma and mental health (World Health Organization, 2013b). As the World Health Organization recommends, primary care practitioners need to be trained and supported in how to ask women in a non-judgemental, empathic way, who are presenting with depression and other mental health symptoms (Garcia-Moreno et al, 2015). Systematic review evidence shows that health practitioners assisting women to recover from depression when also experiencing IPV, could offer psychotherapies that work in this context and are trauma-informed (Hameed et al, 2020; World Health Organization, 2013b). Understanding how women with depression can be holistically supported when the underlying cause of abuse from the partner still exists, often requires engaging with the specialist IPV workforce for referrals (Feder et al, 2011) and secondary consults to address issues of safety (Hameed et al, 2020; Rivas et al, 2015). However, the challenge is for health care professionals to address the diverse needs of women by overcoming the many personal and system barriers to

addressing IPV (Tarzia et al, 2020). Future longitudinal research needs to explore the complex interrelatedness of women's experience of IPV and mental health over longer time periods to enable tailoring of support interventions to women's different trajectories. This will allow us to understand the turning points and early engagement points for primary care in women's pathways to safety and healing.

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