Prevalence and Community Variation in Harmful Levels of Family Conflict Witnessed by Children: Implications for Prevention

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Abstract

Children's reports of high family conflict consistently predict poor outcomes. The study identified criteria for high family conflict based on prospective prediction of increased risk for childhood depression. These criteria were subsequently used to establish the prevalence of high family conflict in Australian communities and to identify community correlates suitable for targeting

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prevention programs. Study 1 utilised a longitudinal design. Grade 6 and 8 students completed a family conflict scale (from the widely used Communities That Care survey) in 2003 and depression symptomotology were evaluated at a 1-year follow-up (International Youth Development Study, $N = 1,798$). Receiver-operating characteristic analysis yielded a cut-off point on a family conflict score with depression symptomatology as a criterion variable. A cut-off score of 2.5 or more (on a scale of 1 to 4) correctly identified 69 % with depression symptomology, with a specificity of 77.2 % and sensitivity at 44.3 %. Study 2 used data from an Australian national survey of Grade 6 and 8 children (Healthy Neighbourhoods Study, $N = 8,256$). Prevalence estimates were calculated, and multivariate logistic regression with multi-level modelling was used to establish factors associated with community variation in family conflict levels. Thirty-three percent of Australian children in 2006 were exposed to levels of family conflict that are likely to increase their future risk for depression. Significant community correlates for elevated family conflict included Indigenous Australian identification, socio-economic disadvantage, urban and state location, maternal absence and paternal unemployment. The analysis provides indicators for targeting family-level mental health promotion programs.

Introduction

The impact of family socialization often accounts for a considerable proportion of the variance in youth maladjustment (Buehler et al. 1997). In particular, exposure to inter-marital, parent-youth and youth-youth conflict undermines the critical and irreplaceable role families perform in ensuring children develop into healthy, well-balanced and mature adults (Alvarado and Kumpfer 2000). However, limited research has been completed into the correlates and outcomes associated with family conflict, defined here as arguments, abusive behaviour, fights and violence between marital or de facto partners or other people within the home. A review of recent studies provides insufficient insight into factors that affect the prevalence and variation in child and adolescent perceptions of family conflict. Establishing family and community correlates of family conflict would help to target vulnerable populations and preventative interventions.

The Consequences of Family Conflict on Development

Over the past 15 years, several high-quality research studies have found that family conflict was a consistent longitudinal predictor of adverse adolescent development. The main longitudinal outcomes from child reports included internalising and externalising symptoms, alternatively reported as depression and aggression (Harold and Conger 1997; Herrenkohl et al. 2009; Neighbors et al. 1997; Rice et al. 2006; Sheeber et al. 1996; Shelton and Harold 2008). A wide variety of other indices of maladjustment included drug and alcohol abuse/dependence, self-blame, self-esteem, stressful life events, poor academic performance, lower life satisfaction and general ill-health (Boynton-Jarrett et al. 2008; Harold et al. 2007; Herrenkohl et al. 2009; Paradis et al. 2009; Shek 1998). Overall, it has been found that

exposure to family conflict has the potential to affect a large range of negative outcomes, but internalising problems are most consistently represented (Harold and Conger 1997; Herrenkohl et al. 2009; Neighbors et al. 1997; Rice et al. 2006; Sheeber et al. 1996; Shelton and Harold 2008), particularly in adolescent depression (Garnefski and Doets 2000; Patton et al. 2008; Sallinen et al. 2004).

Even though many studies have measured children and adolescent's exposure to conflict, one is unique in that it has addressed and reported on the specific levels of cumulative violence exposure necessary for negative health outcomes (Boynton-Jarrett et al. 2008). The finding that exposure to 5 types of violence leads to a 4.6-fold increase in the likelihood of poor health is a well-defined starting point that further research can use to establish a minimum level of perceived conflict that could induce harm in children or adolescents (Boynton-Jarrett et al. 2008). However, a specific level of exposure to conflict within a family context, rather than a general violence exposure measure, would better serve the design and implementation of more targeted community interventions. Developing a cut-off point for harmful levels of family conflict at which or beyond which the likelihood of children and adolescents developing internalising symptoms, especially depression, would show differential increases would assist the identification of community populations most at risk. Conversely, a score below the cut-off threshold would provide a feasible target for communities to achieve low-risk levels of family conflict.

Conceptualising Family Conflict and Maladjustment

Recent theorizing on the influence of family factors on children's psychological adjustment (Morris et al. 2007) argues strongly for the central role that families play in the child's development of emotional regulation as a mediator of adjustment and maladjustment. The family context is influential in terms of three components: first, children learn about emotional regulation from observing family members dealing with emotions; second, parental practices in managing their children's emotions are important; and third, the family's overall emotional climate (e.g. attachment style, marital relationship, expressiveness) impacts on the child's capacity for emotional regulation (Morris et al. 2007). Thus, higher levels of family conflict are likely to adversely affect these processes and undermine adaptive emotional regulation and thus lead to greater risk for maladjustment.

Family conflict may be particularly important in early adolescence when emotional reactions may be heightened by pubertal, physical and social transitions that have the potential to be particularly stressful (Patton et al. 2008). In addition, family conflict may exacerbate adolescent isolation and interfere with parent–adolescent communication preventing avenues for advice and support during stressful periods or in disadvantaged social environments (Lewinsohn et al. 1994).

A Community Approach to Family Conflict

There is a dearth of longitudinal studies on the impacts of family conflict on children. Establishing family and community-level correlates of family conflict would help to target preventative interventions to social environments for vulnerable populations. However, there

is limited literature that has investigated these issues. One study that investigated protective factors that help buffer individuals from the effects of family conflict, in an attempt to identify suitable targets for interventions, found that parental attachment and monitoring had differing effects according to gender (Formoso et al. 2000). However, in a large community sample of children, no gender differences were found when adolescent adjustment, including depression, was correlated with parental unemployment, financial difficulties, socio-economic status and conflict between parents (Fröjd et al. 2009). Likewise, a comprehensive study of economic strain, socio-economic status and family conflict on adolescent psychological adjustment found that age or gender moderated the negative effects of family conflict on internalising symptoms of anxiety and depression and externalising symptoms of aggression; and the absence of one or more parents was not associated with negative youth adjustment or family conflict (Wadsworth and Compas 2002). In broadening the search for correlates of family conflict, economic hardship was far more detrimental to youth adjustment than maternal labour force participation or absent parents (Demo 1992). Single mother's labour force participation was beneficial to the mother–child relationship, provided that the work–family conflict was appropriately managed (Marshall and Tracy 2009). While there is some information available on the effects of single mothers and the absence of fathers from the home, literature on the effects of absent mothers on adolescent adjustment is lacking.

Aims of the Present Study

The present study aimed to provide information that can be used to enhance the community monitoring and prevention targeting of child reports of family conflict. Two studies are used for the analyses presented. In Study 1, data from a prospective study are used to ascertain cut-off scores whereby child and adolescent perceptions of family conflict predict an increased risk of depression. Subsequently, in Study 2, these criteria are applied in a large Australian cross-sectional national survey to assess the community prevalence and factors associated with community variation in child and adolescent perceptions of family conflict.

Method and Materials

Study 1—International Youth Development Study

Participants—Full details of recruitment and participation rates in the international longitudinal study are described elsewhere (McMorris et al. 2006). In summary, the Australian International Youth Development Study (IYDS) sample was representative of the state of Victoria at Wave 1 in 2002, and there was little attrition in subsequent years. A two-stage cluster sampling approach was used for school and student recruitment in 2002. Schools were randomly selected in the first stage, and a target classroom within each school was randomly selected in the second stage. Within each state and grade level, public and private schools containing Grades 5, 7 or 9 were randomly selected using a probability proportionate to grade-level size sampling procedure (Kish 1965). Across the three age cohorts (Grade 5, 7 and 9), 3,926 students were eligible for consent and survey administration, of whom 2,884 (73.5 %) consented and participated. Parents provided written consent for their adolescent to participate in the study, and children provided assent to complete the survey. Retention rates at 1-year follow-up (Wave 2, W2) in 2003 were 99

%. As relevant to the present study a further year of follow-up (Wave 3, W3) was completed in 2004 for the youngest and middle cohorts of the state of Victoria with retention 98 %. The current project sought to identify the relationship between child exposure to family conflict in Grades 6 and 8 and levels of depression 1 year later in an Australian sample. Hence, data used in the current analyses are from the IYDS youngest cohort [N = 927, Grade 6 in 2003 (W2) and Grade 7 in 2004 W3)] and middle cohort [N = 984, Grade 8 in 2003 (W2) and Grade 9 in 2004 (W3)]. Of the initial two cohorts numbering 1,911, there were 1,798 (94 %) included in the current analyses, based on responses to relevant items having been completed at both time points. The Grade 6 cohort was comprised almost entirely of 11- and 12-year-olds, and the Grade 8 cohort of 13- and 14-year-olds, with males and females equally represented.

Procedure—The Royal Children's Hospital Ethics in Human Research Committee in Melbourne approved protocols. Permission to conduct research in schools was obtained in Victoria from the Department of Education and Training for government (public) schools and the Catholic Education Office for some private schools, and then from principals. Surveys in 2003 and 2004 were administered in May to November in Victoria by study staff (McMorris et al. 2006). Surveys were group administered in classrooms during a 50–60-min period. Students absent from school were administered surveys later under the supervision of trained school personnel or in a small percentage of cases (less than 4 % in 2003), over the telephone by study staff. Students were followed into new schools where appropriate. Upon survey completion at both time points, students received small thank-you gifts (a stress ball and marker pen after completing the surveys in 2003 and 2004, respectively).

Study 2—Healthy Neighbourhoods Study

Participants—The Healthy Neighbourhoods Study (HNS) was a cross-sectional survey of Grade 6 and Grade 8 students from schools located in the states of Victoria, Queensland and Western Australia during 2006. Public and private schools were selected within 30 communities and invited to participate. The study was designed to represent the socio-economic variation across Australia, and sample sizes were designed to enable valid epidemiological estimation in each of the 30 communities surveyed within the national sample. Across the 30 communities, 8,256 of the eligible students consented and participated in the survey, representing approximately 54 % of the initially approached students. Of the 30 communities, 14 were from Victoria, 8 from Queensland and 8 from Western Australia. In each state, the Grade 6 cohort was comprised almost entirely of 10- to 12-year-olds, and the Grade 8 cohort of 11- to 13-year-olds, and males and females were equally represented.

Procedure—The study was coordinated by the Centre for Adolescent Health, Murdoch Childrens Research Institute and the Royal Children's Hospital. Ethics approval and permission to conduct research in schools was obtained from the University of Melbourne, Griffith University and Curtin University Human Research Ethics Committees, relevant educational jurisdictions and then from principals. Parents provided written consent for their adolescent to participate in the study, and children provided assent to complete the survey.

The anonymous online surveys were group administered by research staff in classrooms during a 50–60-min period. Surveys were administered during terms two and three of 2006.

Measures

The surveys completed in both the IYDS and HNS were based on Australian adaptations of the Communities That Care youth survey that is a widely used instrument for community-level prevention planning (Arthur et al. 2007). The surveys asked students to relate their experiences and attitudes about family, friends and school, as well as questions about their health and well-being, including: family activities and relationships, physical activity, nutrition, cigarettes, alcohol and other drugs, their neighbourhood, school experiences, friendships, feelings and how they react to situations. Selective measures were used in the present analysis.

Depression Scale

The Short Mood and Feelings Questionnaire (SMFQ; Angold et al. 1995; Messer et al. 1995) was incorporated into both the IYDS and HNS surveys. The SMFQ comprises 13 questions (Cronbach's alpha = 0.94) that asked participants if they had experienced negative mood, feelings and behaviours in the past 2 weeks. Participants could answer questions such as 'I felt miserable or unhappy' and 'I felt so tired I just sat around and did nothing' as either 'True' (=2), 'Sometimes true' (=1) or 'Not true' (=0). Scores on the 13 questions were summed, and scores of 11 or greater were used to define depression symptomatology (Patton et al. 2008; Angold et al. 2002; McKenzie et al. 2011). Following convention (Angold et al. 1995; McKenzie et al. 2011), if the responses to four or less SMFQ questions were missing, they were replaced with the mean value of the remaining items. If more than four responses were missing, the overall SMFQ score was set to missing.

Family Conflict

Three questions from the Communities That Care youth survey were included in the IYDS and HNS surveys to obtain participant's perceptions of family conflict: 'We argue about the same things in my family over and over', 'People in my family have serious arguments' and 'People in my family often insult or yell at each other' (Herrenkohl et al. 2009). Participants could answer the questions 'YES!' indicating that they thought the statement was definitely true (4), 'yes' indicating mostly true (3), 'no' indicating mostly not true (2), 'NO!' indicating definitely not true (1). Responses to these questions were averaged to provide a perceived family conflict score (range 1 to 4, Cronbach's alpha = 0.74). Demographic measures (Healthy Neighbourhoods Study)

Community Status—Socioeconomic status (SES) was measured using Socioeconomic Indicators for Areas (Australian Bureau of Statistics 2006) scores for advantage/disadvantage from the 2001 Australian Census. Postcodes of residence were used to derive quartiles of disadvantage from lowest to highest. Area of residence was also used to code regional location (urban, rural) and state [Victoria (VIC), Queensland (QLD) and Western Australia (WA)].

Respondent Demographics—Respondent demographics were established by survey responses relevant to gender (male, female), age (years), school grade (6, 8), ethnicity (born outside Australia), Indigenous Australian identification (Aboriginal or Torres Strait Islander heritage) and mother and father labour force participation (not working, working full time; part time; retired and parent/step parent doesn't live with me). There is no consensus in relation to reporting the social demographics of young people in situations where there are non-resident parents/guardians. A recent report on non-resident fathers in Australia found that while most fathers agree that continued financial support of their children is important, other factors complicate their willingness and happiness to pay child support (Natalier and Hewitt 2010). To avoid misrepresentation of potential financial security within the home, as indicated by employment, we have presented non-resident parents/guardians as a separate category.

Analyses

Unless specified otherwise, all analyses were performed using Stata 11 statistical software (Stata Corporation, College Station, TX, 2009). A receiver operating characteristic analysis (Swets 1995) was completed on the IYDS data in order to help determine the best cut-off point on the Family Conflict Score using depression symptomotology as the outcome or criterion variable. For each obtained cut-point, the sensitivity (probability of a positive test result, such as meeting or exceeding a particular cut-point for the Family Conflict Score among those with depression symptomotology), specificity (probability of a negative test result amongst those without symptoms), false positive rate (one minus specificity, equal to the probability of positive test result for those without depression symptoms), positive predictive value (probability of having depression symptomotology for those with a positive test result), negative predictive value (probability of not meeting criteria for those with a negative test result). Area under the ROC curve was computed as an overall measure of test performance. The latter value is equal to the probability that a random individual meeting criteria (e.g. having depression symptoms) has a higher value of the measurement (e.g. a positive test result) than a random individual not meeting criteria. An area under the curve of 0.50 denotes chance level performance (Kraemer 1992).

The intra-class correlation coefficient, a commonly employed measure of such clustering (Muller and Buttner 1994), was 0.02 for school clustering of the depression dependent variable in the IYDS, and 0.03 and 0.05 for community and school variation in the HNS. As even very slight levels of intra-class correlation can affect the results of significance tests and confidence intervals, ROC analyses employed bootstrap techniques (Efron and Tibshirani 1993) to calculate confidence intervals, with 10,000 resamples (McKenzie et al. 2011), employing the cluster option in Stata. Logistic regression analyses in the IYDS, and chi-square and prevalence analyses in the HNS, were completed with the cluster and svy options within Stata to adjust for the clustering of students in classrooms. Multilevel modelling (Hox 2010; Rabe-Hesketh and Skrondal 2008) was used to complete amultivariate logistic regression analysis controlling for school and community clustering in the HNS.

Results

Study 1

The ROC analysis employed family conflict scores reported by the Australian youngest and middle IYDS cohorts in 2003 when participants were in Grades 6 and Grade 8 as the independent variable. The dependent variable was depression symptomotology 1 year later as recorded in 2004, recoded to reflect high scores of 11 or more. Four hundred and forty-five of the 1,798 participants had depression symptomotology (24.7 %, 95 % confidence interval = 22.2 % to 27.3 %). The ROC analysis demonstrated that family conflict scores provided a slight but statistically significant prospective prediction for individual depression symptomotology. The analysis revealed that 64.2 % (95 % confidence interval = 60.9 to 67.0 %) of the area fell beneath the ROC curve ($n = 1,798$). In balancing specificity as well as sensitivity, examination of the ROC suggested a cut-off for family conflict of 2.5 or higher, which exhibited higher specificity than did a cut-off of 2.33 and a slightly higher sensitivity than did a cut-off of 2.67. Using a cut-off of 2.5, 69.0 % were correctly classified with specificity 77.2 %, sensitivity 44.3 %, positive predictive value 38.9 % and negative predictive value 80.8 %. Measures of performance for each obtained cut-point are provided in Table 1.

Study 2

Participants that scored 2.5 on the family conflict measure were analysed to establish prevalence and variations within the 30 individual communities. The total prevalence of children with elevated risk due to family conflict was 33 % [95 % confidence interval (CI), 31–34 %] across all communities ($n = 7,876$). Figure 1 shows the variation across all communities broken down by the independent variable of socio-economic quartile (1 = low SES to 4 = high SES). There was a wide range in the community prevalence of children with elevated family conflict across communities from 24.5 to 47.9 %, with variation not completely explained by socio-economic disadvantage. Scores above and below 33 % may indicate communities that have characteristics that influence family conflict. Figure 1 shows that high SES communities consistently had prevalence rates below 33 %, indicating that high SES was protective.

Cross-tabulations were used in the HNS data to further investigate the relationships between elevated family conflict and the independent variables listed in Table 2. The frequencies, percentages of elevated risk and family conflict probabilities (percentages) were examined as part of an overall (not pairwise) chi-square test (calculated using Wald statistics). Statistically significant differences in levels of family conflict were obtained for Indigenous Australian identification ($\chi^2 = 9.1$, $p = 0.003$), birthplace ($p = 0.006$), SES ($p = 0.002$), state ($p = 0.005$) and mother and father work status ($p<0.0001$). Participants' gender, grade and metropolitan location were not associated with family conflict. Factors associated with reduced family conflict included high SES (29.2 %), living in Victoria (30.8 %), mother working part time (30.4%) and father working full time (30.9%). Table 3 presents findings from a multilevel logistic regression analysis predicting elevated family conflict in the HNS.

After adjusting for other variables, family conflict showed significant associations with age, Indigenous Australian identity, country of birth, SES, state and mother and father's work status. Compared to the younger age group, more family conflict was reported by the older group [odds ratio (OR) = 1.18]. Relative to those living in communities at the lowest SES quartile, there was less family conflict for those in the highest (OR = 0.76) SES quartiles. Family conflict was not significantly different where mothers were in full-time or part-time work compared to where mothers did not work; however, higher rates of family conflict were associated with mother not residing in the home (OR = 1.84) compared to resident mothers that were not working. Fathers working full time was associated with lower family conflict (OR = 0.71) compared to fathers that were not working. Repeated ROC analyses completed in the sufficiently sized sub-samples defined by the variables in Table 3 found the family conflict cut-point and association with depression were consistent across sub-samples, with the association slightly higher for females relative to males.

Discussion

The findings reported in the current paper provided important, but previously unavailable information required for community mental health promotion projects to target the prevention of child exposure to family conflict. Study 1 used a large longitudinal study to establish that a cut-off of 2.5 on a widely used epidemiological measure of child and adolescent perceptions of family conflict predicts subsequent elevations in risk for early adolescent depressive symptoms. The second study then applied this cut-off to establish, in a large community epidemiological study, that the prevalence of child exposure to potentially harmful levels of family conflict was 33 % (95 % CI = 31 to 34 %) of Australian children. In addition, study 2 has identified a number of community correlates that can be useful in efforts to target family conflict prevention programs.

The survey questions contained in both the IYDS and the HNS surveys were epidemiologically valid and reliable measures of perceived family conflict that have been widely applied in the Communities That Care survey (Hemphill et al. 2006) and in previous longitudinal studies (Herrenkohl et al. 2009). Using a cut-off score of 2.5 and above for the family conflict measure predicted an elevated risk of adolescent depressive symptoms.

An analysis of the prevalence of family conflict identified considerable variation across 30 communities varying in socio-economic status. This variation supports the requirement for community-based interventions (Slep and Heyman 2008). The findings from the multilevel regression analyses demonstrate that community variation in family conflict was only partly explained by location and socio-demographic factors entered into the models.

A range of community factors were examined as correlates explaining observed variation in community rates of family conflict. The finding that older age was associated with increased family conflict is consistent with the proposition that the adolescent transition contributes to family arguments and conflict (Steinberg and Morris 2001). The finding that gender did not significantly influence the experience of adverse family conflict is consistent with previous findings (Fröjd et al. 2009; Wadsworth and Compas 2002). The multivariate multilevel analysis showed effects for both socio-economic status and maternal absence from the

home. Significantly higher rates of family conflict were correlated with the small number of cases where mothers were not residing in the family home. The effect for socio-economic disadvantaged communities aligned with prior research (Wadsworth and Compas 2002). The higher rate of family conflict associated with maternal absence from the home was contrary to prior research (Demo 1992; Wadsworth and Compas 2002) and to Demo's (1992) proposal that family conflict is largely driven by economic hardship and not by parental absence from the home. The present study is not able to identify temporal precedence or causal ordering of associations, but the observed associations may be speculated to be explained by family conflict as the parent's relationship deteriorates.

The present analysis found that parent's labour force participation was associated with children's perceptions of family conflict. This influence differed for mothers and fathers. Lower family conflict was evident where father's worked full time relative to not working. Contrary to prior research associating lower family conflict with mother's part-time work (Buehler and O'Brien 2011), the present findings revealed similar rates of family conflict for mothers not working versus working part or full time.

The effect of state and region location were evident in the multivariate model adjusting for demographic factors of indigenous status, country of birth and parental presence, suggesting that these effects were not explained by state and regional differences across factors such as family demographics. The higher level of family conflict reported in the state of Queensland relative to Victoria and in metropolitan regions was unanticipated and has not been previously reported, suggesting that future research may need to examine potential differences between these states (e.g. social, economic and geographic) which may contribute to variation in family conflict.

The present study suggests the possibility of epidemiologically assessing community levels above which family conflict may present risks to child and adolescent development and adjustment. The fact that the cut-off level was established using child and adolescent perceptions within a large and state-representative cohort is valuable for planning services at a national level.

Limitations were that the family conflict items did not provide specific details of conflict events and protagonists, and the cut-off scores were not validated against community family service data and other criteria such as more extensive investigation of family conflict. Other limitations were that the use of a simple cut-off approach, although very useful in mental health promotion targeting, may obscure the linear (or non-linear) effect of higher levels of family conflict to predict depression symptoms. Although the present study was able to identify a range of community indicators that were associated with high rates of family conflict, the study design was not able to identify causal pathways and the analysis was restricted to a relatively small set of predictors. Future research will need to examine cultural and community variation in perceived family conflict.

Although the present findings cannot determine a causal relationship, they suggest directions for future intervention research to evaluate whether delivering universal interventions to reduce community indicators of child-reported family conflict can contribute to enhancing

child mental health at a population level. There are a range of community-level interventions that could be used to advance child mental health promotion by targeting communities that have high rates of family conflict. Universal intervention programs have been subjected to controlled evaluation and demonstrated effectiveness in contributing to population improvements in parental relationship harmony (Barlow et al. 2002) and reductions in coercive parenting (Thomas and Zimmer-Gembeck 2007) and parent–youth conflict (Toumbourou and Gregg 2002). Delivering universal interventions tailored to community risk profiles has been shown to be feasible and cost-effective (Kuklinski et al. 2012) and avoids the risks of stigmatization and inaccurate screening that can occur in efforts to target services to individuals and families.

A home environment that is safe, supportive and fulfils the role of buffering children from experiences and perceptions of conflict will remain an important ideal for optimising mental health. The broad range of negative health outcomes that have been associated with exposure to family conflict (Paradis et al. 2009) highlight the enormous costs of failing to realise this ideal.

Acknowledgments

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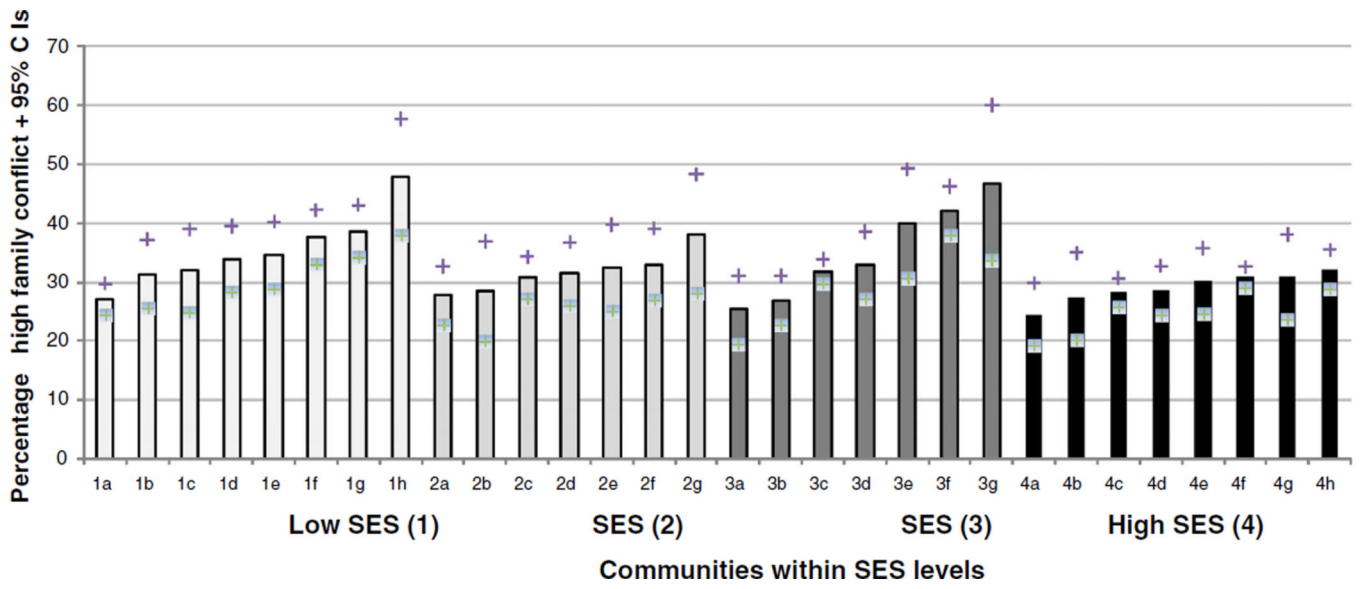
Fig. 1.
Percentage of participants with elevated risk of family conflict as a function of community
(*a, b, c …*) and socio-economic status level (*1* to *4*)

Table 1

Screening performance of Family Conflict Score at predicting depression symptoms

Cut-point for Family Conflict Score	N with depression symptomotology absent (overall *n* =1,353)	N with depression symptomotology present (overall *n* = 445)	Sensitivity (%)	Specificity (%)	False positive rate (100–specificity)	PPV (%)	NPV (%)
0	1,353	445	100.0	0.0	100.0	24.7	0.0
1.0	1,353	445	100.0	0.0	100.0	24.7	0.0
1.33	1,098	407	91.5	18.9	81.1	27.0	87.0
1.5	922	362	81.3	31.9	68.1	28.2	83.9
1.67	922	361	81.1	31.9	68.1	28.1	83.7
2.0	777	321	72.1	42.6	57.4	29.2	82.3
2.33	478	255	57.3	64.7	35.3	34.8	82.2
2.5	309	197	44.3	77.2	22.8	38.9	80.8
2.67	303	195	43.8	77.6	22.4	39.2	80.8
3.0	177	137	30.8	86.9	13.1	43.7	79.3
3.33	82	81	18.2	93.9	6.1	49.7	77.7
3.5	54	61	13.7	96.0	4.0	53.0	77.2
3.67	54	60	13.5	96.0	4.0	52.6	77.1
4.0	26	35	7.9	98.1	1.9	57.4	76.4

PPV positive predictive value, *NPV* negative predictive value, expressed as percentages (definitions provided in text)

Table 2

Summary of number of participants, percentage of participants with elevated risk of family conflict, Chi-squares and probabilities

Variable	N	Chi-square, prob/% Family conflict
Gender	(N = 7,876)	$\chi^2 = 0.31$, $p = 0.58$
Male	3,762	33.1
Female	4,114	32.5
Grade	(N = 7,876)	$\chi^2 = 0.02$, $p = 0.89$
Grade 6	4,301	32.9
Grade 8	3,575	32.7
Indigenous Australian	(N = 7,876)	$\chi^2 = 9.09$, $p = 0.003$
No	7,633	32.4
Yes	243	44.0
Born outside Australia	(N = 7,866)	$\chi^2 = 7.63$, $p = 0.006$
No	7,140	33.3
Yes	726	28.0
SES	(N = 7,876)	$\chi^2 = 15.13$, $p = 0.002$
1 (Low)	2,234	35.1
2 (Mod Low)	1,906	31.8
3 (Mod High)	1,832	34.7
4 (High)	1,904	29.2
Location	(N = 7,876)	$\chi^2 = 2.92$, $p = 0.09$
Metropolitan	3,952	34.0
Non-metropolitan	3,924	31.6
State	(N = 7876)	$\chi^2 = 10.91$, $p < 0.005$
VIC	3,695	30.8
QLD	2,337	36.6
WA	1,844	31.8
Mother work status	(N = 7,769)	$\chi^2 = 30.2$, $p < 0.0001$
Not working	1,861	34.1
Full time	2,844	33.0
Part time	2,861	30.4
Retired	114	43.9
Not at home	89	52.8
Father work status	(N = 7,721)	$\chi^2 = 40.7$, $p < 0.0001$
Not working	447	40.3
Full time	5,714	30.9
Part time	1,066	35.0
Retired	121	42.2
Not at home	373	41.8

SES socio-economic status, *VIC* Victoria, *QLD* Queensland, *WA*Western Australia, χ2 Chi-square based on Wald test associating independent variables with high family conflict with analysis adjusted for clustering by school using STATA svy command

Table 3

Summary of multilevel logistic regression analysis predicting family conflict

Variable	OR	Multilevel analysis		
		95 %	CI	*p*
Female	0.99	0.89	1.09	0.793
Age	1.18	1.07	1.29	0.001[**]
Grade 8	0.93	0.87	1.01	0.081
Indigenous Australian	1.38	1.05	1.81	0.021[*]
Born outside Australia	0.71	0.60	0.86	0.000[***]
Socioeconomic status (referent = low)				
SES (2)	0.84	0.70	1.01	0.065
SES (3)	0.97	0.81	1.17	0.760
SES (4) High	0.76	0.63	0.92	0.005[**]
Non-metropolitan	0.84	0.74	0.97	0.014[*]
State (referent = Victoria)				
QLD	1.52	1.28	1.80	0.000[***]
WA	1.19	0.99	1.42	0.063
Mother work status (referent = not working)				
Full-Time	1.03	0.90	1.17	0.682
Retired	1.35	0.90	2.03	0.147
Part time	0.90	0.79	1.02	0.098
Not at home	1.84	1.18	2.87	0.007[**]
Father work status (referent = not working)				
Full time	0.71	0.58	0.87	0.001[**]
Retired	1.03	0.67	1.57	0.908
Part time	0.84	0.66	1.06	0.141
Not at home	1.06	0.79	1.41	0.710

N = 7,661. Multilevel logistic regression including all variables in the table

OR odds ratios, *95 % CI* 95 % confidence intervals, *p* probabilities

[*]
*p*0.05;

[**]
*p*0.01;

[***]
*p*0.001