Risk of child maltreatment in Chinese teenage and young mothers with rapid repeat pregnancy: The moderating role of family cohesion and support from friends

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ABSTRACT (273 words)

Rapid repeat pregnancy (RRP) often occurs in teenage and young mothers. Mothers with a history of RRP are more likely to experience high stress increasing their risk of child maltreatment. Despite these challenges, some mothers can continue to cope adaptively. Social support may play a role in empowering these mothers to overcome the childbearing difficulties. Although the protective effects of social support are well recognized, there has been little evidence on the relative importance of sources of support. For example, whether support from family and friends are equally important in relieving parenting stress remains unanswered. RRP, a social phenomenon encompassing various adverse living and parenting issues, provides an ideal research context to investigate the role of family and friends in preventing child maltreatment. This study examined whether family cohesion and friends' support moderated the association between RRP and child maltreatment in young mothers. We recruited 392 Chinese teenage and young mothers from a population-based integrated young mothers supporting program in Hong Kong. Questionnaires on pregnancy history, family cohesion, social support and risk of child maltreatment were administered. Moderation analysis was conducted to examine the effect of RRP on child maltreatment as a function of family cohesion or friend support. Results showed that RRP was associated with a higher risk of child neglect (aOR=1.72, $p<0.05$) and physical maltreatment (aOR=1.91, $p<0.01$) and that family cohesion was more important than friend support in mitigating the risk of child maltreatment for mothers with a history of RRP. Our findings suggest that

interventions for young mothers particularly those with a history of RRP should be family-based so the whole family can be empowered to tackle the childrearing burden.

Keywords:

Rapid repeat pregnancy; Early motherhood; Child maltreatment; Family cohesion; Social support

INTRODUCTION

Rapid repeat pregnancy (RRP), defined as any pregnancy occurring within 24 months after previous pregnancy (Mott, 1986), is common among teenage and young mothers. Previous western studies showed that nearly one fifth of the youth in the United Kingdom and United States had experienced RRP (Dee et al., 2017; Meade & Ickovics, 2005; Milne & Glasier, 2008). Although support programs for adolescent and young mothers are available, a previous study found that adolescent pregnancy is associated with increased postpartum feelings of guilt, regret, hopelessness, and apprehension (Woo & Twinn, 2004). For mothers who also experience RRP, their burden can be even larger. Previous studies found that repeat pregnancies can lead to adverse health, financial, educational, and psychosocial outcomes among teenage and young mothers (Centers for Disease Control and Prevention, 2013). RRP was found to increase maternal risks of nutritional deficiencies and reproductive health problems (Conde-Agudelo, Rosas-Bermudez, Castaño, & Norton, 2012) and dependence on public welfare assistance due to the lack of education and employment opportunities (Mahoney, 2008; Polit & Kahn, 1986). In addition, mothers with RRP were more likely to experience elevated parenting stress and social stigmatization than those without RRP (Crowne, Gonsalves, Burrell, McFarlane, & Duggan, 2012). Whether elevated parenting stress trigger inappropriate parenting behavior in mothers with RRP warrant further investigations.

Child maltreatment, an umbrella term encompassing any violence acts against children (Pinheiro, 2006), is a prevalent social and public health issue, with around 10% of children worldwide reporting ever exposure to physical abuse or neglect events (Gilbert et al., 2009). Child maltreatment is associated with various health, social, and behavioural problems at the individual level and increased healthcare cost at the society level (Fang, Brown, Florence, Mercy, & neglect,

2012; Peterson, Florence, & Klevens, 2018). Notably, young mothers with RRP experiences are more prone to child maltreatment (Crowne et al., 2012). Research found that child maltreatment, RRP, and teenage and young motherhood share a similar set of risk factors, including low educational attainment, material deprivation, social isolation, and elevated parenting stress, which can jeopardize the health and development of both the mother and her child (Cox et al., 2008). In Chinese societies, physical punishment is generally acceptable and Chinese mothers often use corporal punishment as an immediate disciplinary tactics to manage children's disruptive and disobedient behaviors (O'Brian & Lau, 1995). A review suggested that the parenting style of Chinese parents is mostly influenced by the Confucianism- and Taoism- based culture that stresses the importance of proper conduct and absolute obedience in their offspring (Shek & Sun, 2014). A population-based study in Hong Kong found that about 25% of children had experienced physical abuse (C. K. Lo et al., 2019). This further suggests that while some parents resort to physical force to manage child behavior, many parents in Hong Kong are able to use alternative parenting tactics.

Family cohesion, a fundamental dimension of family relationship which refers to the "emotional bonding that family members have toward one another" (Barber & Buehler, 1996), was found to improve early motherhood outcomes (Barnett, Mills-Koonce, Gustafsson, & Cox, 2012; Leidy, Guerra, & Toro, 2012). Specifically, concern and care between members in a cohesive family environment can enhance the mental health of both the mother and her child (Barber & Buehler, 1996; Barnett et al., 2012). High mutual support and low conflicts between family members may also reduce the risk of child maltreatment (Higgins & McCabe, 2003). On the other hand, social support refers to various forms of social interactions between family members, friends, and neighbours such as information exchange, being supportive, and showing

concern in the face of crisis and stressful events (Siedlecki, Salthouse, Oishi, & Jeswani, 2014; Zimet, Dahlem, Zimet, & Farley, 1988) and was related to better perinatal outcomes (Breedlove, 2005). In particular, Chinese culture has a great emphasis on family interdependence, obligation, and cohesion, which may offer valuable support above any other sources in times of distress (Juang & Alvarez, 2010). However, no studies to date have compared the effects of sources of support (e.g. from friends or family). Such investigations would advance our understandings and inform future care and support strategies for teenage and young mothers.

Although a previous study found that the median age of the first-time mother in Hong Kong was 26 years old (Cheung, Ip, & Chan, 2007), a significant proportion of women in Hong Kong delivered their first child in adolescence or early adulthood period (HKSAR Census and Statistics Department, 2018), suggesting that teenage pregnancy has been an ongoing social issue in Hong Kong. However, little is known about the rate of RRP among Hong Kong young mothers, and the roles of family and friends in preventing child maltreatment in these families remain unclear both locally and internationally. To fill in these research gaps, this study assessed the association between RRP and child maltreatment among Chinese teenage and young mothers in Hong Kong. The potential buffering effects of family cohesion and support from friends on this association were also examined. We hypothesized that RRP was associated with a higher risk of child maltreatment among these mothers and that family cohesion had a stronger effect than support from friends in preventing child maltreatment.

METHODS

Study participants

This study involved Hong Kong Chinese teenage and young mothers who delivered their first child at or before the age of 23 years which follows the definition of teenage and young pregnancy in previous studies (Borkowski, Whitman, & Farris, 2007). To be eligible for participation in this study, the mothers had to know and read Chinese and have no major mental health problems at the time of survey. Eligible mothers were recruited from a local integrated population-based early motherhood program which serves over 300 young mothers in Hong Kong annually. The aim of the program is to provide comprehensive support and training to teenage and young mothers with unplanned pregnancy to build up their capacity in handling tasks and problems arisen. During the period of January to June 2015, we approached 410 mothers who had been actively participating in the program. Among them, 392 provided consent to join this study, resulting in a high participation rate of over 95%. Upon collecting informed consent, trained social workers administered the study questionnaires to the mother participants. The mothers were reminded that all the child-related items in the survey focused on their first child. Further details about the study can be found in our previous publication (C. K. Lo et al., 2017).

Measures

This study used a comprehensive set of questionnaires to collect information on the mother's basic demographic background, previous experiences of pregnancy, history of risky behaviors, current mental health condition, ways to discipline their first child, as well as her perceived family cohesion and social support.

Rapid Repeat Pregnancy (RRP)

Pregnancy spacing was measured with items on the date and outcome of each pregnancy experienced by the mother. In this study, RRP is defined as any pregnancy occurring within 24

months after any previous pregnancy outcome, inclusive of abortion, miscarriage, still birth, or live birth (Centers for Disease Control and Prevention, 2013).

Demographics and maternal engagement in risky behaviors

The study questionnaire included basic demographic items on maternal age, education attainment, current employment and marital status, parity, details of pregnancy history, and family income as well as the age and gender of the first child. In addition, items on the mother's engagement in risky behaviors including smoking, illicit drug use and alcohol consumption in the preceding month were also included.

Frequency of child maltreatment

The Parent-Child Conflict Tactics Scale (CTS-PC) was used to measure the frequency of child maltreatment acts (Straus, Hamby, Finkelhor, Moore, & Runyan, 1998). In this study, mothers answered the CTS-PC frequency items on use of corporal punishment (5 items, e.g. *slapping on the bottom, hand, arm or leg*), physical maltreatment (4 items, e.g. *knocking children down*), severe physical maltreatment (4 items, e.g. *beating*), neglect (5 items, e.g. *leaving the children home alone even when you thought some adults should be with them*), and psychological aggression behavior (5 items, e.g. *threatening to spank or hit*) toward their first child in the preceding year. A dichotomous coding ("yes" or "no") was created to indicate whether the mothers perpetrated any child maltreatment acts in the preceding year. The Chinese version of CTS-PC has been used in local studies ($\alpha = 0.77$ to 0.88) (Chan et al., 2012).

Mothers' experience of childhood abuse

Information on mothers' experience of childhood abuse was extracted from the official medical records in the Clinical Data Analysis and Reporting System (CDARS) which is a reliable and powerful warehouse of medical and clinical data from all public hospitals in Hong Kong and

has been used for examination of the prevalence and trend of child maltreatment in Hong Kong (C. K. M. Lo et al., 2018). Using participants' unique identifier, a period of 25-year hospital data (1993-2018) including emergency room attendance and hospitalization records were retrieved from the CDARS. Mother participants with a diagnosis of any type of child maltreatment (ICD-9 codes: 995.5 or 995.8 or E967.0-E967.9) were categorized as those with a history of childhood abuse in this study.

Mothers' family environment

The family cohesion subscale of the Family Environment Scale (FES) (Harris & Molock, 2000) was used in this study to measure the mother's perception of family cohesion. The family cohesion subscale was designed to measure the level of concern, commitment and support provided by the family members. This subscale consists of 9 items on a 6-point Likert scale. The Chinese version of this subscale has been used in a previous local adolescent study ($\alpha = 0.86$) (Lee, Wong, Chow, & McBride-Chang, 2006).

Mothers' perceived social support

The Support from Friends subscale of the Multidimensional Scale of Perceived Social Support (MSPSS) was used to assess the mother's perceived level of support from friends (Zimet et al., 1988). The subscale has 12 items on a 7-point Likert scale. The item scores can be added up to a total score ranging from 12 to 84. The Chinese version of this scale has been used in previous studies with excellent internal consistency (Chou, 2000).

Statistical analysis

The generalized extreme studentized deviate (GESD) test was used to detect outliners in the dataset. The GESD test is a generalization of the Grubbs test which can be used to test for multiple potential outliers without causing inflation on type I error. Outliers were excluded from

subsequent analyses (Rosner, 1983). Hierarchical hot deck imputation was used to handle the missing values which account for less than 5 percent of the data. Hot deck imputation is a relatively robust technique for handling missing data than mean substitution and complete data analysis, as it provides estimates on the missing values based upon other participants with similar selected characteristics by single imputation (Myers, 2011). All the study results were generated based on the imputed data.

Demographics and patterns of risky behaviors (smoking status, alcohol consumption frequency and drug abuse history in the preceding month) were compared between mothers with and without experience of RRP using the chi-square test (for categorical variables) and independent samples T-test (for continuous variables). To examine the associations between RRP and different types of child maltreatment behaviors, logistic regression analyses were conducted. An adjusted model was constructed for each child maltreatment outcome. Age of the first child, maternal education level, marital status and adjusted family monthly income were included as covariates in the model. A series of moderated regression models were also constructed to test whether family cohesion and social support from friends interacted with RRP to predict the risk of child physical maltreatment and neglect. If a significant interaction is found, it means that the effect of RRP on child maltreatment (physical maltreatment and neglect) differs based on the level of family cohesion or support from friends. The pattern of significant interactions was further examined by plotting a clustered bar-chart. In this study, the p-value of less than 0.05 indicates statistical significance determined by the two-tailed test. All the analyses were performed using the Statistical Package for Social Sciences (SPSS, version 24.0).

Ethics Approval

This study and the consent procedures were approved by the ethical committee of the Institutional Review Board of the University of Hong Kong/Hospital Authority Hong Kong West Cluster. Written informed consents were obtained from all the participating mothers.

RESULTS

This study recruited 392 mothers. On average, their age was 21.8±3.0 years, and their first child was 2.7±2.3 years old. 51.0% of mothers gave birth within the age of 17 to 19 years. Around 43.1% completed high school education. Only 6.9% received tertiary education. There were 19.9% working full time, 10.7% working part time, and more than 7% unemployed. Majority of them (71.9%) had one child only. Over 40% smoked at the time of interview. In the month preceding the interview, 4.1% had drug use experience and 0.8% consumed alcohol every day. Moreover, 2.8% had childhood abuse experiences.

Of all the mother participants, 137 (34.9%) had experienced RRP. The demographics of the overall sample and mothers with and without RRP are presented in Table 1. Significant between-group differences were found only on maternal education attainment ($p<0.05$), number of childbirths ($p<0.001$), and maternal current smoking behaviors ($p<0.01$).

Maternal risk of child maltreatment

The prevalence of child maltreatment among the teenage and young mothers is showed in Table 2. In the year preceding the interview, the prevalence of child maltreatment among the surveyed mothers was 31.1% for child physical maltreatment, 40.1% for neglect, 78.3% for corporal punishment, 84.9% for psychological aggression, and 4.1% for severe physical maltreatment. Significant associations were found between RRP and various maternal disciplinary tactics toward their first child. Mothers with RRP were more likely to use neglect (aOR= 1.65, $p<0.05$) and physical maltreatment behavior (aOR= 2.12, $p<0.01$) toward their child. No

associations were found between RRP and other disciplinary tactics such as corporal punishment, severe physical maltreatment and psychological aggression (Table 2). Moderation analyses were therefore performed in the domains of child physical maltreatment and neglect only.

The moderating effect of mother's perceived family cohesion and support from friends

Family cohesion was found to moderate the association between RRP and child maltreatment. Specifically, within the RRP group, the risk of child physical maltreatment (aOR=0.28, $p<0.01$) and neglect (aOR=0.44, $p<0.05$) was significantly lower in mothers who perceived high family cohesion than those who perceived low family cohesion. The risk of child maltreatment did not differ as a function of perceived family cohesion for mothers without RRP (Physical maltreatment: aOR=1.14, p=0.67; Neglect: aOR=0.81, p=0.48) (Figures 1A & 1B). As displayed in Figure 1a, the prevalence of physical maltreatment was over 50% among mothers with both RRP and low family cohesion, whereas the prevalence was around 20% in the other mothers. In Figure 1b, the prevalence of neglect reached almost 60% when the mothers experienced both RRP and low family cohesion, but it was around 40% for the other mothers. On the other hand, perceived support from friends did not moderate the association between RRP and child maltreatment. In other words, the rates of child physical maltreatment and neglect were similar between mothers with high friend support and those with low friend support.

DISCUSSION

This study examined the association between RRP and risk of child maltreatment among Chinese teenage and young mothers in Hong Kong. In addition, we examined the effects of perceived family cohesion and support from friends in preventing child maltreatment for such unique and understudied population. Consistent with our hypotheses, RRP was found to increase

risk of child maltreatment, particularly physical maltreatment and neglect. Moreover, while the effect of support from friends on mothers' risk of child maltreatment was not significant, family cohesion significantly reduced child maltreatment events especially among mothers with a history of RRP.

In this study, more than 30% of the mothers adopted physically abusive disciplinary tactics both alone and in conjunction with other types of disciplinary tactics. These patterns are consistent with those reported by other local studies and reports (Chan, 2005; Chan et al., 2012). On the other hand, RRP in this study had a stronger association with physically abusive parenting behavior than neglectful parenting behavior which is different from the findings of some studies in other countries (Crowne et al., 2012; Zuravin, 1988). This could be because compared to western families, Chinese families generally accept and use physical punishment tactics more frequently and immediately to manage children's disruptive and disobedient behaviors (O'Brian & Lau, 1995). In addition, we found that when examining the child maltreatment prevalence as a function of the mother's RRP experience, the rates of child physical maltreatment and neglect were higher in mothers with a history of RRP than those without RRP, possibly because early motherhood by itself is a significant stressor. When RRP occur, it can add more financial difficulties and parenting demands to the young mothers and thus increase the risk of child maltreatment in these families (Herrman, 2006; Mahoney, 2008; Polit & Kahn, 1986).

In addition, we found that family cohesion significantly reduced the risk of child physical abuse and neglect among mothers with RRP. To better illustrate the importance of family cohesion, we used support from friends as a comparison variable (Lipsitch, Tchetgen, & Cohen, 2010). Consistent with our hypothesis, only family cohesion significantly reduced child maltreatment events in mothers with RRP. Although support from friends can empower one to cope with stress

and other psychological symptoms (Chou, 2000; Procidano & Heller, 1983), family cohesion appears to be more useful in preventing child maltreatment. This could be because child maltreatment is a family issue which cannot be controlled or intervened by friends (Stith et al., 2009). On the other hand, a cohesive family environment characterized by strong family bonds (Barber & Buehler, 1996) allows for mutual help and sharing among family members especially when facing challenges such as childrearing burden. For example, if the mother is unable to provide care to the child or she uses harsh parenting behavior toward the child, other family members can intervene and provide immediate help to address the child's problems or needs. It is evident that families low in cohesion are more likely to have conflicts which may increase the mother's risk of child maltreatment (Herrman, 2006; Stith et al., 2009). By contrast, a cohesive family environment provides emotional and instrumental support to the mother that can reduce the risk of child neglect (Schumacher, Slep, & Heyman, 2001). Future research should unravel the mechanisms underlying the association between family functioning and different types of child maltreatment.

This study has several limitations. First, participants in this study were recruited based on the service target of a local supportive program and might not be truly representative of all teenage and young mothers in Hong Kong. However, our large sample size and good response rate should have strengthened the representativeness of our research findings. As the findings were based on a group of teenage and young mothers, the results should be generalized with caution especially in older mothers. Second, this was a cross-sectional study in which mothers' recall of pregnancy history could cause biased results. Third, mothers may be unwilling to unveil sensitive information such as the frequency of use of maladaptive parenting practice due to fear of social stigmatization. Hence, we allocated trained social workers from the supportive program to assist the mothers in

completing the questionnaires. Lastly, we did not collect data on the child's father, although we use relationship status as a proxy to address the potential effect of chaotic relationships on the mothers. Furthermore, the effect of family functioning and friend support may depend on the cultural context. Chinese generally uphold the tradition of family values, and this may contribute to the stronger protective effect from family than friends observed in this study. Future research should replicate this study in other populations to confirm the significance of family cohesion and friend support for prevention of child maltreatment.

CONCLUSION

Our study findings present a key message to service providers on the importance of early intervention for teenage and young mothers especially those with a history of RRP. Current programs for young mothers offer general support and training with few programs designed to address the consequences of RRP on the mother and family. Apart from strengthening contraceptive education, there should be public education about the consequences of special pregnancy experiences such as RRP in the mother and her offspring. Consultation and support can also be provided to these mothers to help them cope with stressful childrearing circumstances thereby reducing the risk of child maltreatment. Furthermore, more interventions should be developed to improve the family atmosphere of the young mothers. Building a supportive family environment will help ease the burden of early motherhood and improve the outcomes of RRP for both mothers and their offspring.

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Table 1. Characteristics of the study participants

	Mean (SD) / N (%)			
	Overall (N=392)	With RRP (N=137)	Without RRP (N=255)	p
Age of the mother	21.78 (2.97)	22.43 (2.70)	21.44 (3.06)	0.001
Age of the first child	2.70 (2.34)	3.23 (2.33)	2.42 (2.30)	0.001
Gender of the first child				0.33
Male	202 (51.5)	66 (48.2)	136 (53.3)	
Female	190 (48.5)	71 (51.8)	119 (46.7)	
Age of the mother at 1st delivery				0.62
13-16 years	67 (17.1)	22 (16.1)	45 (17.6)	
17-19 years	200 (51.0)	67 (48.9)	133 (52.2)	
Above 19 years	125 (31.9)	48 (35.0)	77 (30.2)	
Current marital status				0.26
Single	156 (39.8)	54 (39.4)	102 (40.0)	
Married	204 (v52.0)	68 (49.6)	136 (53.3)	
Divorced	31 (7.9)	15 (11.0)	16 (6.3)	
Missing	1 (0.3)	0 (0.0)	1 (0.4)	
Highest Education level attained				0.02
Lower secondary school or before	195 (49.7)	67 (48.9)	128 (50.2)	
Upper secondary school	169 (43.1)	67 (48.9)	102 (40.0)	
Tertiary education	27 (6.9)	3 (2.2)	24 (9.4)	
Missing	1 (0.3)	0 (0.0)	1 (0.4)	
Employment status				0.35
Full time	78 (19.9)	25 (18.2)	53 (20.8)	
Part time	42 (10.7)	18 (13.1)	24 (9.4)	
Unemployed	28 (7.1)	13 (9.5)	15 (5.9)	
Housewife	239 (61.0)	83 (58.4)	159 (62.4)	
Missing	5 (1.3)	1 (0.7)	4 (1.6)	
Number of children				<0.001
1	282 (71.9)	68 (49.6)	214 (83.9)	
2	94 (24.0)	55 (40.1)	39 (15.3)	
3	13 (3.3)	11 (8.0)	2 (0.8)	
4 or more	3 (0.8)	3 (2.2)	0 (0.0)	
Family income adjusted for household size (HKD)	3,725 (2,499)	3,482 (2,369)	3,856 (2,562)	0.16
Current smokers	168 (42.9)	72 (52.6)	96 (37.6)	0.002
Current alcohol consumption frequency (preceding month)				0.05
Never	254 (64.8)	80 (58.4)	174 (68.2)	
1 to 9 days	99 (25.3)	43 (31.4)	56 (22.0)	
10 to 29 days	20 (5.1)	11 (8.1)	9 (3.7)	
30 days	3 (0.8)	1 (0.7)	2 (0.8)	
Missing	16 (4.1)	2 (1.5)	14 (5.5)	
Mothers with childhood abuse experience	11 (2.8)	3 (2.2)	8 (3.1)	0.76
Mothers with drug abuse experience in preceding month	16 (4.1)	9 (6.6)	7 (2.7)	0.12

Table 2. Prevalence of maternal child maltreatment in preceding year and its association with the experience of RRP

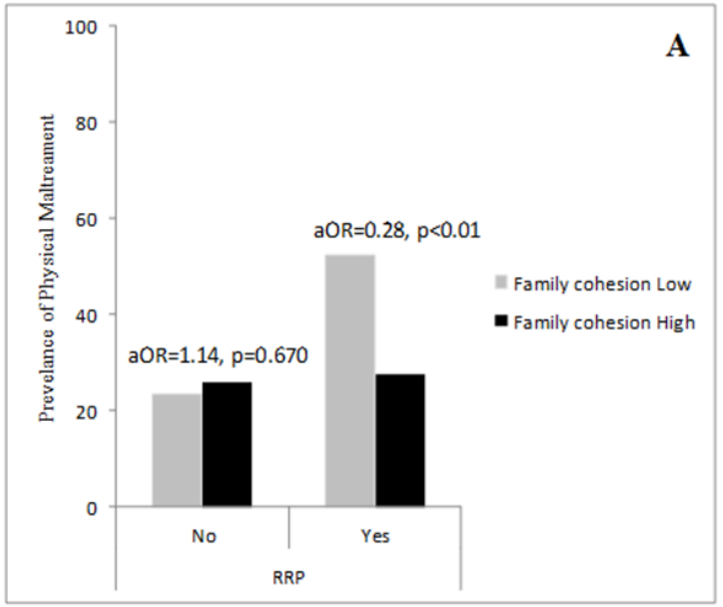
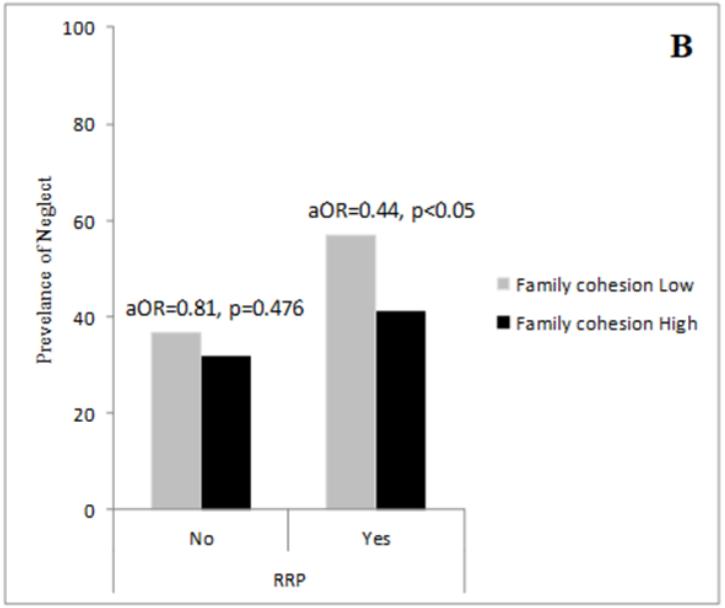
Disciplinary tactics [a]	Prevalence (Preceding year) (%)			AOR (95% CI)	p	
	Overall	With RRP	Without RRP			
Corporal punishment	78.3	78.3	78.0	0.97 (0.57, 1.64)	0.91	
Physical maltreatment	31.1	43.1	24.7	1.91 (1.20, 3.03)	0.006	**
Severe physical maltreatment	4.1	5.8	3.1	2.01 (0.71, 5.67)	0.19	
Neglect	40.1	44.6	34.1	1.72 (1.10, 2.70)	0.02	*
Psychological aggression	84.9	85.4	84.7	0.70 (0.37, 1.33)	0.28	

Note: *p<0.05; **p<0.01; ***p<0.001

All models adjusted for mother's marital status and education level; adjusted family income level; age of 1st child.

[a] Disciplinary tactics, percentage of mothers reporting the use of tactic at least once on the CTS-PC subscale

Figure 1. Effects of family and social environment on the risk of child maltreatment among mothers with and without RRP experience

Moderator	Engagement in child maltreatment	
	Physical maltreatment	Neglect
Family cohesion		
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