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Associations between child maltreatment and adolescents' health-related quality of life and emotional and social problems in low-income families, and the moderating role of social support

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Abstract

This study aimed to examine the associations between different types of child maltreatment and health-related quality of life (HRQoL) and emotional and social problems in adolescents, and to examine the moderating effect of social support on those associations. A cross-sectional survey was conducted between January and June 2016 in Hong Kong. The sample comprised 351 parent-and-adolescent dyads from low-income families. The parents reported on child maltreatment (physical abuse, psychological aggression, and neglect), and the adolescents reported on their HRQoL, emotional problems, and social problems. The adolescents' perceived social support was included as a potential moderator. Results of the study show that child physical abuse was strongly associated with emotional and social problems (B ranged from 0.91 to 1.45, $p < .05$). Lower overall HRQoL was associated with psychological aggression (B = -3.96, $p < .05$) and neglect (B = -4.14, $p < .05$). Physical functioning was affected by psychological aggression (B = -3.16, $p < .05$), and emotional functioning was affected by neglect (B = -4.82, $p < .05$). Social functioning was impacted by all three types of maltreatment (B ranged from -9.16 to -5.26, $p < .05$). This study extends previous literature by showing the varying effects of different types of child maltreatment on children's health in the context of low-income families. The findings of this study also support that peer social support may buffer the effects of child physical abuse on adolescents' emotional and social problems.

Keywords: Child maltreatment, adolescents, health-related quality of life, social support, Chinese

52 **Introduction**

53

54 It has been estimated that every year 4–16% of children are physically abused and 10% of
55 children are neglected or psychologically abused (Gilbert et al., 2009). Studies have
56 consistently found that exposure to child maltreatment is associated with negative
57 consequences in the children's mental and physical health (Ip et al., 2015; Norman et al.,
58 2012). Not only that, there is an exposure-response relationship between the number of types
59 of childhood maltreatment and the negative health consequences (Afifi et al., 2007;
60 Agorastos et al., 2014).

61

62 Health is defined as a state of physical, mental, and social well-being, and not merely the
63 presence or absence of diseases (World Health Organization, 1948), thereby indicating that
64 health is a multidimensional construct. Aligning with this idea is the concept of health-related
65 quality of life (HRQoL), which encompasses broad areas of subjective functional status in
66 physical, psychological, social, and school dimensions (Jud, Landolt, Tatalias, Lach, & Lips,
67 2013; Rajmil et al., 2004). While some of these underlying dimensions, such as social and
68 emotional functioning have been widely examined in the literature, HRQoL is a much
69 broader concept reflecting subjective health state (physical and mental health) of a person and
70 is determined by various domains in life including social and emotional functioning (Ware,
71 2003). A disease or injury may disrupt any of the dimensions, which would then impair
72 HRQoL (Ware, 2003). Health-related quality of life goes beyond direct measure of particular
73 disease, symptoms, or problems, and moves toward a holistic approach to understand the
74 impact of health on a person's quality of life. The measure of HRQoL has been used to
75 compare across health conditions (Varni, Limbers, & Burwinkle, 2007) and evaluate
76 intervention outcomes to inform disease prevention and health promotion (Casey et al., 2014).

Extant evidence has shown that child maltreatment is related to child emotional, social, and behavioral problems (Éthier, Lemelin, & Lacharité, 2004; Lansford et al., 2002; Vachon, Krueger, Rogosch, & Cicchetti, 2015), which may in turn affect children's daily life and reduce their quality of life (Stevanovic, 2013). Two systematic reviews show that past studies generally indicate impaired quality of life in adult survivors of childhood maltreatment, and very limited research has focused on health-related quality of life of child or adolescent victims (Prosser & Corso, 2007; Weber, Jud, & Landolt, 2016). The few studies that do exist on this topic have been conducted in clinical samples (Jud et al., 2013; Marium et al., 2011) and in general children (Al-Fayez, Ohaeri, & Gado, 2012; Chan, 2013; Chan, Chen, Chen, & Ip, 2017), and those studies commonly have found a lower HRQoL among maltreated children. However, HRQoL of maltreated children in the context of low-income families is largely unknown. Also, previous studies have not addressed whether different types of child maltreatment have varying associations with different aspects of the victims' HRQoL. This knowledge gap needs to be filled, because low socioeconomic status (SES) is associated with an elevated risk of exposure to child maltreatment (Eckenrode, Smith, McCarthy, & Dineen, 2014) and disadvantaged health such as lower HRQoL and worse mental health (Hussey, Chang, & Kotch, 2006; Rajmil, Herdman, Ravens-Sieberer, Erhart, & Alonso, 2014). Furthermore, when children from a low-SES background are exposed to trauma, they have appeared to experience greater negative mental health consequences than have children from a more advantaged background (Andrews et al., 2015).

In addition to testing the association of child maltreatment with health, it is even more important to examine factors that may buffer (moderate) such a relationship. Family and peers are two important sources of social influences that are associated with adolescent well-

102 being. Positive parent-child relationships that are supportive, affectionate and allow the child
103 appropriate autonomy are associated with short and long- term mental well-being in
104 adolescents (Stafford, Kuh, Gale, Mishra, & Richards, 2016). A study shows that adolescents
105 who perceived low level of support from teachers did not result in low school achievement or
106 low psychological well-being if they had at least moderate relatedness with peers (León &
107 Liew, 2017). According to the stress-buffering mechanism, social support from family,
108 friends, and significant others can mitigate deleterious effects of stressful circumstances
109 (Cohen & Wills, 1985). In particular, a critical factor in social support operating as a stress
110 buffer is the perception that others will provide appropriate psychological and material
111 resources, and such belief may strengthen one's perceived ability to cope with demands, thus
112 changing the appraisal of the situation and reducing related stress (Cohen, 2004). However,
113 sometimes these social relationships can also be sources of conflicts and may not function as
114 a source of support, such as in the situation of child maltreatment. In understanding the
115 stress-buffering role of social support in child maltreatment, recent empirical research has
116 demonstrated that perceived social support could reduce the negative impacts of child
117 victimization on children's health outcomes (Chan et al., 2017). Yet, limited is known
118 whether family and peer support both serve a buffering effect for child maltreatment. As
119 shown by a meta-analysis study, perception of social support is related to the well-being of
120 children, but the effect size of social support varied across sources of social support such that
121 teachers and school personnel support evidenced the strongest association with wellbeing
122 followed by family support and peer support (Chu, Saucier, & Hafner, 2010). Also, it has
123 been suggested that the effects of family support on children's well-being decrease during
124 adolescence, while the effects of peer support increase with age (Makri-Botsari, 2005). Based
125 on these findings, investigating whether different sources of social support (e.g., peers and

family) moderate the negative effects of child maltreatment on adolescents' HRQoL would further contribute to the existing knowledge.

Using a parent-adolescent matched sample from low-SES families in Hong Kong, this study aimed to parse the relations between different types of child maltreatment and adolescents' health outcomes, including their HRQoL and emotional and social problems. This study also examined the moderating effect of social support in reducing the negative effects of child maltreatment on adolescents' health. We hypothesized that (1) child maltreatment would be negatively associated with adolescents' HRQoL; (2) child maltreatment would be positively associated with adolescents' emotional and social problems; and (3) adolescents' perceived social support would moderate the relationship between child maltreatment and adolescents' HRQoL and emotional and social problems.

Methods

Study design and participants

This study adopted a cross-sectional study design and was conducted between January and June 2016. A total of 351 parent-and-adolescent dyads from Hong Kong families with a low socioeconomic background were recruited through nongovernmental organizations which provided a range of community services, such as interest class and supportive services to low-income families. The families were recipients of Comprehensive Social Security Assistance or full grants from student finance schemes administered by the Student Financial Assistance Agency, or their household income was less than 75% of the median monthly domestic household income, which was equivalent to USD 3205.13 (Census and Statistics

151 Department, 2016). Written informed consent was obtained from parents of adolescents
152 under age 18 and written informed consent was obtained from the participants over age 18.
153 The adolescent participants were also informed that they are free to refuse to answer any
154 question or withdraw from the participation. The study was approved by the Institutional
155 Review Board of the University of Hong Kong/ Hospital Authority Hong Kong West Cluster.

156

157 **Statistical analyses**

158 The participants' demographic characteristics, including gender and age of parents and
159 children, parents' years of schooling, and family income, were summarized using descriptive
160 statistics. The mean scores and standard deviations (SD) of the scales measuring adolescent-
161 reported perceived social support, HRQoL, and emotional and behavioral problems were
162 computed. The percentages of parent-reported perpetration of corporal punishment and
163 different types of child maltreatment, including severe physical abuse, very severe physical
164 abuse, psychological aggression, and neglect were also computed.

165 To examine the associations between child maltreatment and adolescent HRQoL and
166 emotional and behavioral problems, we conducted a series of multiple regression analyses,
167 adjusting for age, gender, and family income. Further, moderation analyses were conducted
168 to examine the potential moderating effect of adolescent perceived social support on the
169 associations between child maltreatment and health outcomes. All tests were two-tailed and
170 performed with R Statistical Software v3.4.3, and the statistical significance level was set
171 at .05 in two-tailed tests.

172

173 **Measures**

174

175 **Parents' report: Child maltreatment.** The Parent-Child Conflict Tactics Scale (CTS-PC;
176 Straus, Hamby, Finkelhor, Moore, & Runyan, 1998) was used to measure parents'
177 perpetration of child maltreatment against their child during the year preceding the study.
178 Parents were asked to respond to 5 subscales. On the severe physical maltreatment subscale,
179 parents reported perpetration of acts, including slapping the child, hitting the child with a
180 hard object, throwing or knocking the child down, and hitting the child with a fist or kicking
181 the child hard (4 items). On the very severe physical maltreatment subscale, parents were
182 asked to report acts such as beating the child, grabbing the child around the neck and choking
183 the child, burning the child on purpose, and threatening the child with a knife or weapon (4
184 items). On the neglect subscale, parents reported neglectful acts, including leaving the child
185 home alone, withholding food and medical care when the child was in need of them, having a
186 problem taking care of the child due to being drunk or high, and not being able to show care
187 to the child due to their own problems (5 items). On the psychological aggression subscale,
188 parents were asked to report acts such as shouting, yelling, cursing, and name calling (5
189 items); parents were also asked to report corporal punishment, such as pinching and shaking
190 (5 items). The Chinese version of the CTS-PC has been used in local studies (Chan,
191 Brownridge, Yan, Fong, & Tiwari, 2011) and has been found to have satisfactory reliability
192 and validity, with Cronbach's alpha ranging from 0.77 to 0.88 (Chan et al., 2012). In this
193 study, the Cronbach's alpha for the subscales ranged from 0.80 to 0.98.
194
195 **Adolescents' report: Problem behaviors.** The Chinese version of the Strengths and
196 Difficulties Questionnaire (SDQ; Lai et al., 2010) was used to measure four problems and
197 difficulties in adolescents. We used 4 subscales of 5 items each: *hyperactivity*, *emotional*
198 *symptoms*, *conduct problems*, and *peer problems*, and a total *difficulties score*. All items were
199 rated on a 3-point scale (where 0 = *not true* and 2 = *certainly true*). The externalizing score is

200 the sum of the conduct and hyperactivity subscales, and the internalizing score is the sum of
201 the emotional- and peer-problem scales. The higher the score is, the higher the frequency of
202 problem behaviors. The Cronbach's alpha for the overall difficulties score was 0.81, and the
203 alphas of the subscales ranged from 0.45 to 0.76.

204

205 **Adolescents' health-related quality of life.** The adolescents' HRQoL was assessed by the
206 23-item Chinese version of the Pediatric Quality of Life Inventory (PedsQL) and the Generic
207 Core Scale (child version) (Lau et al., 2010). The measurement consists of 4 subscales
208 measuring health-related difficulties in various aspects of the adolescents' lives, including
209 their physical functioning (8 items), emotional functioning (5 items), social functioning (5
210 items), and school functioning (5 items). All items were rated on a 5-point scale (ranging
211 from 0 = *never a problem* to 4 = *always a problem*). To ease analysis and interpretation, all
212 item scores were transformed in this study to a range from 0 = *very poor* to 100 = *very good*.
213 Higher scores indicate a better HRQoL. The Cronbach's alphas ranged from 0.76 to 0.93 for
214 the subscales (Lau et al., 2010).

215

216 **Adolescents' perceived social support.** The Multidimensional Scale of Perceived Social
217 Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988) is a 12-item measure that captures
218 the adolescents' perceived social support from their family (4 items), friends (4 items), and
219 significant others (4 items). The items were rated on a 7-point scale (ranging from 1 = *very*
220 *strongly disagree* to 7 = *very strongly agree*). The higher the score is, the higher the level of
221 social support. The Chinese version of the MSPSS demonstrated concurrent validity, and the
222 Cronbach's alphas for the overall score, the friends subscale, and the family subscale were
223 0.89, 0.94, and 0.86, respectively (Chou, 2000).

224 **Covariates.** The parents' gender, age, educational attainment, family income, and their
225 child's age and gender were collected in the study.
226

227 ## Results

228

229 As shown in Table 1, the mean age of participating parents (83.8% female, 16.2% male) in
230 the study was 48.23 years (SD = 6.95), their mean number of years of education was 9.82
231 years (SD = 3.27), and the average monthly family income was equivalent to USD 2254.27
232 (SD = 1153.90). The parents were matched with 351 adolescents (56.0% female, 44% male),
233 who had a mean age of 18.3 years (SD = 2.37). Among the parents, 52.7% reported having
234 perpetrated psychological aggression against their child during the year preceding the study,
235 25.4% reported neglect, 17.4% reported using corporal punishment, 4.6% reported severe
236 physical abuse, and 3.1% reported very severe physical abuse.
237

238 Table 2 shows the associations between different types of child maltreatment and adolescent
239 problem behaviors. Child physical abuse was associated with total difficulties (B = 3.33, p
240 $< .05$). In particular, child physical abuse was strongly associated with internalizing behaviors,
241 including peer problems and emotional problems, and there is a gradient relationship between
242 the two variables, such that the adolescents who experienced very severe physical abuse (B =
243 1.45, $p < .05$) were at greater risk of having peer problems and emotional problems than were
244 those who experienced severe physical abuse (B = 0.91, $p < .05$). We could not detect any
245 associations between externalizing behaviors, such as hyperactivity and conduct problems,
246 and any types of child maltreatment.
247

The associations between different types of child maltreatment and the subscales of HRQoL, as measured by PedQL, are presented in Table 3. A lower overall adolescent HRQoL was associated with psychological aggression (B = -3.96) and neglect (B = -4.14), with p values smaller than .05. Physical functioning was specifically affected by psychological aggression (B = -3.16, $p < .05$), and emotional well-being was specifically affected by neglect (B = -4.82, $p < .05$). Social functioning was impacted by all three types of maltreatment: physical abuse, psychological aggression, and neglect, with B ranging from -9.16 to -5.26, and with p values smaller than .05.

Finally, as shown in Figure 1, adolescents' overall social support reduced the harmful effect of physical maltreatment on internalizing behaviors (peer and emotional problems) ($p < .05$). When the social support was perceived to be at the highest level on the scale, there was a null association between physical maltreatment and internalizing behaviors. When different sources of social support were examined separately, only social support from friends was a significant moderator that reduced the effect of child maltreatment on internalizing behaviors ($p < .05$).

Discussion

Using a parent-adolescent matched sample from low-income families in Hong Kong, this study provides evidence for the associations between child maltreatment and adolescents' health outcomes in terms of HRQoL, and emotional and social problems. This study also demonstrates that adolescents perceived social support, especially from peers, can moderate the associations between child physical abuse and adolescents' emotional and social problems. This study contributes to the underdeveloped area of research on health-related

273 characteristics of maltreated children in economically disadvantaged families and suggests
274 that childhood maltreatment would undermine one's social emotional functioning during
275 adolescence.
276
277 Existing literature shows that child maltreatment is an important determinant of various
278 aspects of a child's health (Afifi et al., 2007; Chan et al., 2017). Our findings add to the
279 literature that the impacts of different types of maltreatment on health are not uniform. Child
280 physical abuse was strongly associated with internalizing behaviors, including peer and
281 emotional problems. In contrast to previous studies (Heleniak, Jenness, Vander Stoep,
282 McCauley, & McLaughlin, 2016; Kim & Cicchetti, 2010), we did not find significant
283 associations between child maltreatment and externalizing behaviors, such as hyperactivity
284 and conduct problems. This finding suggests that adolescent victims in this sample may be
285 more affected by peer and emotional problems than by hyperactivity and conduct problems.
286
287 In our sample, parents more commonly reported having perpetrated psychological aggression
288 (52.7%) than neglect (25.4%) and physical abuse (3.1% for severe physical abuse and 4.6%
289 for very severe physical abuse), in the year preceding the study. A previous study found
290 preceding year prevalence of 53.9%-59.3% for psychological aggression, 15.7%-19% for
291 neglect, 3.6%-3.8% for severe physical abuse, and 0.5%-0.6% for very severe physical abuse,
292 using a representative sample of parents of adolescents in Hong Kong (Chan, 2012). Neglect
293 and severe physical abuse were more commonly reported in this study than in Chan (2012).
294 This may be because the parents in this study were of low SES backgrounds hence exposed to
295 risks that put them at higher risk for child maltreatment. Of note, this study consisted of a
296 sample with a mean age of 18.3 years, indicating that the sample was in their mid to late
297 adolescence. Studying child maltreatment in this age group of adolescents is relevant because

298 95% of Hong Kong adolescents and young adults aged 15 to 24 years are living with their
299 parents (Census and Statistics Department, 2018). There are several reasons for adolescents
300 to stay with their parents in Hong Kong, such as the high costs of living and housing in Hong
301 Kong and the influence of Chinese cultural value that emphasizes family tie and
302 interdependence. Psychological aggression and neglect, the most common types of child
303 maltreatment the adolescents exposed to, significantly associated with the victims' overall
304 HRQoL. Our findings support the idea that more attention, in terms of identification and
305 intervention, should be given to psychological aggression and neglect, because they are
306 usually under-recognized (Glaser, 2002; Spinazzola et al., 2014). Looking more closely at the
307 associations between the different types of child maltreatment and the different domains of
308 HRQoL, various forms of child maltreatment emerged as significant predictors of HRQoL.
309 Lower physical functioning was specifically associated with psychological aggression, and
310 lower emotional functioning was particularly related to neglect. Impairment in social
311 functioning was commonly affected by all three types of maltreatment: child physical abuse,
312 neglect, and psychological aggression. This study is among the first to provide evidence for
313 the associations between different types of child maltreatment and various aspects of child
314 HRQoL, and that these associations are not uniform.
315
316 In alignment with the stress-buffering hypothesis, social support, particularly peer support,
317 emerged as an important moderator in mitigating internalizing behaviors (emotional and
318 social problems) that were associated with physical abuse. The finding is consistent with a
319 previous study showing that peer support is particularly important for physically abused
320 children's psychological functioning (Ezzell, Swenson, & Brondino, 2000). Although family
321 is an important source of security and support for children and adolescents, family support
322 did not serve as a buffer for child maltreatment in this study. This may be explained by a

323 reason that perpetrators of child maltreatment are most often parents (U.S. Department of
324 Health & Human Services, 2018). When children and adolescents experience such
325 frightening experience in the family, they may be less likely to turn to their family for support.
326 Maltreated adolescents may turn to other sources of support, hence, peer support may be
327 more important in such situations. This finding suggests that in the face of violence, the
328 beneficial sources of social support may differ according to the victim's circumstances of
329 maltreatment. Similarly, in the literature on peer bullying, studies have found that support
330 from a parent, teacher, or classmate, but not from close friends, reduced the impacts that peer
331 bullying had on the victim's distress (Davidson & Demaray, 2007). In such situation, family
332 support may be more important than peer support. In this study, social support did not
333 moderate the effects of psychological abuse and neglect, indicating that perceived social
334 support may not be strong enough to buffer the negative effects of these two types of child
335 maltreatment. Further empirical studies to explore other possible and stronger moderating
336 factors that could minimize the negative health impacts of child maltreatment are needed.
337
338 **Implications**
339
340 As this study show that social support, particularly peer support serves as an important
341 protective factor in mitigating the effects of child maltreatment on health outcomes,
342 interventions for maltreated adolescents that focus on enhancing and expanding their social
343 network, and the accessibility to social networks outside their family may be a promising
344 strategy in reducing the harm of child maltreatment on health. Yet, it is not easy to help
345 adolescents extend their social network outside the family because they may not have the
346 adequate social skills and the confidence to build meaningful relationship with others,
347 especially for those who did not have one with their parents. Our findings indeed show that

348 victims of different types of child maltreatment commonly experienced peer difficulties, and
349 that fact may inhibit victims from seeking help from others. It is important for helping
350 professionals to nurture adolescents' confidence and competence in social relationships, and
351 to help identify support network that is useful for them. For example, support provided by
352 grandparents is culturally relevant in Asian context because it is common for grandparents to
353 live with or close to their grandchildren (Mehta & Thang, 2011), and there are potential
354 benefits of the role of grandparents in family functioning in Chinese context (Emery, Thapa,
355 Do, & Chan, 2015). In terms of research, further empirical study is needed to delineate other
356 potential mediating and moderating mechanisms that underlie the relationships between
357 different forms of child maltreatment and children's health outcomes to further inform
358 intervention strategies. Also, further research should identify which domains of health-related
359 quality of life are most relevant to which types of child maltreatment.
360
361 **Limitations**
362
363 Because this study was limited by the use of a cross-sectional survey design, it could not
364 confirm a causal relationship between child maltreatment and health variables. Future
365 research may benefit from the use of a prospective, longitudinal design. In addition, there
366 might be potential reporting bias in the parents' reports and adolescents' reports with regard
367 to child maltreatment and the children's health conditions. Further study could consider
368 including multiple informants to collect relevant data. Still, rather than relying on proxy
369 reports (Palermo et al., 2008), subjective measures such as HRQoL are usually assessed from
370 the person's own perspective, as we did by using adolescents reporting on the health
371 variables that we deemed appropriate in this study. Another limitation of this study is the use
372 of dichotomization of presence of maltreatment or not according to the parents' self-report of

child maltreatment acts without differentiating severe and less severe forms of child maltreatment, particularly for psychological aggression and neglect. Because the participants in this study were sampled from low-SES families in Hong Kong, our findings may not be generalized to a population with a higher SES or other cultural context. Finally, the majority of parent respondents were mothers (83.7%), hence the impact of father perpetrated child maltreatment on adolescent health outcomes may not be fully captured in this study.

Conclusion

Using a parent-child matched sample, this study extended previous literature by examining the associations between different types of child maltreatment and child health variables in the context of low-income families. The results demonstrated that different types of child maltreatment had varying associations with the adolescents' health variables. Peer social support moderated the association between child physical abuse and children's problem behaviors.

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References

Afifi, O. T., Enns, W. M., Cox, J. B., De Graaf, J. R., Ten Have, J. M., & Sareen, J. J. (2007). Child Abuse and Health-Related Quality of Life in Adulthood. *The Journal of Nervous and Mental Disease, 195*(10), 797-804. doi:10.1097/NMD.0b013e3181567fdd

Agorastos, A., Pittman, J. O. E., Angkaw, A. C., Nievergelt, C. M., Hansen, C. J., Aversa, L. H., . . . Baker, D. G. (2014). The cumulative effect of different childhood trauma types on self-reported symptoms of adult male depression and PTSD, substance abuse and health-related quality of life in a large active-duty military cohort. *Journal of Psychiatric Research, 58*, 46-54. doi:10.1016/j.jpsychires.2014.07.014

Al-Fayez, G. A., Ohaeri, J. U., & Gado, O. M. (2012). Prevalence of physical, psychological, and sexual abuse among a nationwide sample of Arab high school students: association with family characteristics, anxiety, depression, self-esteem, and quality of life. *Social Psychiatry and Psychiatric Epidemiology, 47*(1), 53-66. doi:10.1007/s00127-010-0311-2

Andrews, A., Jobe-Shields, L., López, C., Metzger, I., de Arellano, M., Saunders, B., & Kilpatrick, D. (2015). Polyvictimization, income, and ethnic differences in trauma-related mental health during adolescence. *The International Journal for Research in Social and Genetic Epidemiology and Mental Health Services, 50*(8), 1223-1234. doi:10.1007/s00127-015-1077-3

Casey, M. M., Harvey, J. T., Telford, A., Eime, R. M., Mooney, A., & Payne, W. R. (2014). Effectiveness of a school-community linked program on physical activity levels and health-related quality of life for adolescent girls. *BMC Public Health, 14*, 649. doi:http://dx.doi.org/10.1186/1471-2458-14-649

Census and Statistics Department. (2016). *Quarterly report on general household survey*. Hong Kong Special Administrative Region: Census and Statistics Department of the HKSAR Government.

Census and Statistics Department. (2018). *2016 Population by-census thematic report: Youths*. Hong Kong Special Administrative Region: Census and Statistics Department of the HKSAR Government.

Chan, K. L. (2012). Comparison of parent and child reports on child maltreatment in a representative household sample in Hong Kong. *Journal of Family Violence*, *27*(1), 11-21.

Chan, K. L. (2013). Victimization and poly-victimization among school-aged Chinese adolescents: Prevalence and associations with health. *Preventive Medicine, 56*(3), 207-210. doi:https://doi.org/10.1016/j.ypmed.2012.12.018

Chan, K. L., Brownridge, D. A., Fong, D. Y. T., Tiwari, A., Leung, W. C., & Ho, P. C. (2012). Violence against pregnant women can increase the risk of child abuse: A longitudinal study. *Child Abuse & Neglect, 36*(4), 275-284. doi:https://doi.org/10.1016/j.chiabu.2011.12.003

Chan, K. L., Brownridge, D. A., Yan, E., Fong, D. Y., & Tiwari, A. (2011). Child maltreatment polyvictimization: Rates and short-term effects on adjustment in a representative Hong Kong sample. *Psychology of Violence, 1*(1), 4.

Chan, K. L., Chen, M., Chen, Q., & Ip, P. (2017). Can family structure and social support reduce the impact of child victimization on health-related quality of life? *Child Abuse & Neglect, 72*, 66-74. doi:https://doi.org/10.1016/j.chiabu.2017.07.014

Chou, K.-L. (2000). Assessing Chinese adolescents' social support: the multidimensional scale of perceived social support. *Personality and Individual Differences, 28*(2), 299-307.

Chu, P. S., Saucier, D. A., & Hafner, E. (2010). Meta-analysis of the relationships between social support and well-being in children and adolescents. *Journal of Social and Clinical Psychology, 29*(6), 624-645.

Cohen, S. (2004). Social relationships and health. *American Psychologist, 59*(8), 676.

Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin, 98*(2), 310-357.

Davidson, L. M., & Demaray, M. K. (2007). Social Support as a Moderator Between Victimization and Internalizing--Externalizing Distress From Bullying. *School Psychology Review, 36*(3), 383-405.

Eckenrode, J., Smith, E. G., McCarthy, M. E., & Dineen, M. (2014). Income Inequality and Child Maltreatment in the United States. *Pediatrics, 133*(3), 454-461. doi:10.1542/peds.2013-1707

Emery, C. R., Thapa, S., Do, M. H., & Chan, K. L. (2015). Do family order and neighbor intervention against intimate partner violence protect children fromabuse? Findings from Kathmandu. *Child Abuse & Neglect, 41*, 170–181.

Éthier, L. S., Lemelin, J.-P., & Lacharité, C. (2004). A longitudinal study of the effects of chronic maltreatment on children's behavioral and emotional problems. *Child Abuse & Neglect, 28*(12), 1265-1278. doi:https://doi.org/10.1016/j.chiabu.2004.07.006

Ezzell, C. E., Swenson, C. C., & Brondino, M. J. (2000). The relationship of social support to physically abused children’s adjustment. *Child Abuse & Neglect, 24*(5), 641-651.

Gilbert, R., Widom, C. S., Browne, K., Fergusson, D., Webb, E., & Janson, S. (2009). Burden and consequences of child maltreatment in high-income countries. *The Lancet, 373*(9657), 68-81.

Glaser, D. (2002). Emotional abuse and neglect (psychological maltreatment): a conceptual framework. *Child Abuse & Neglect, 26*(6), 697-714. doi:https://doi.org/10.1016/S0145-2134(02)00342-3

Heleniak, C., Jenness, J. L., Vander Stoep, A., McCauley, E., & McLaughlin, K. A. (2016). Childhood maltreatment exposure and disruptions in emotion regulation: A transdiagnostic pathway to adolescent internalizing and externalizing psychopathology. *Cognitive Therapy and Research, 40*(3), 394-415.

Hussey, J. M., Chang, J. J., & Kotch, J. B. (2006). Child maltreatment in the United States: Prevalence, risk Factors, and adolescent health consequences. *Pediatrics, 118*(3), 933.

Ip, P., Wong, R. S., Li, S. L., Chan, K. L., Ho, F. K., & Chow, C. B. (2015). Mental health consequences of childhood physical abuse in Chinese populations: A meta-analysis. *Trauma, Violence, & Abuse, 17*(5), 571–584.

Jud, A., Landolt, M. A., Tatalias, A., Lach, L. M., & Lips, U. (2013). Health-related quality of life in the aftermath of child maltreatment: follow-up study of a hospital sample. *Quality of Life Research, 22*(6), 1361-1369. doi:10.1007/s11136-012-0262-z

Kim, J., & Cicchetti, D. (2010). Longitudinal pathways linking child maltreatment, emotion regulation, peer relations, and psychopathology. *Journal of Child Psychology and Psychiatry, 51*(6), 706-716. doi:10.1111/j.1469-7610.2009.02202.x

Lai, K. Y., Luk, E. S., Leung, P. W., Wong, A. S., Law, L., & Ho, K. (2010). Validation of the Chinese version of the strengths and difficulties questionnaire in Hong Kong. *Social Psychiatry and Psychiatric Epidemiology, 45*(12), 1179-1186.

Lansford, J. E., Dodge, K. A., Pettit, G. S., Bates, J. E., Crozier, J., & Kaplow, J. (2002). A 12-year prospective study of the long-term effects of early child physical maltreatment on psychological, behavioral, and academic problems in adolescence.

Archives of Pediatrics & Adolescent Medicine, 156(8), 824-830. doi:10.1001/archpedi.156.8.824

Lau, J. T. F., Yu, X. N., Chu, Y., Shing, M. M. K., Wong, E. M. C., Leung, T. F., . . . Mak, W. W. S. (2010). Validation of the Chinese version of the Pediatric Quality of Life InventoryTM (PedsQLTM) Cancer Module. *Journal of Pediatric Psychology, 35*(1), 99-109. doi:10.1093/jpepsy/jsp035

León, J., & Liew, J. (2017). Profiles of adolescents' peer and teacher relatedness: Differences in well-being and academic achievement across latent groups. *Learning and Individual Differences*, *54*, 41-50.

Makri-Botsari, E. (2005). Risk/protective effects on adolescent depression: Role of individual, family and peer factors. *Psychological Studies, 50*(1), 50-61.

Marium, Z., Susmita, M. K.-Z., Shalonda, K. S., Janelle, R. A., Kimberly, A. B., Susan, L. L., . . . Scott, W. P. (2011). Childhood abuse in pediatric patients with chronic daily headache. *Clinical Pediatrics, 51*(6), 590-593. doi:10.1177/0009922811407181

Mehta, K. K., & Thang, L. L. (2011). . Experiencing grandparenthood: an Asian perspective (Vol. 47) London: Springer Science & Business Media.

Norman, R. E., Byambaa, M., De, R., Butchart, A., Scott, J., & Vos, T. (2012). The long-term health consequences of child physical abuse, emotional abuse, and neglect: A systematic review and meta-analysis. *PLoS Medicine, 9*(11), e1001349. doi:10.1371/journal.pmed.1001349

Palermo, T. M., Long, A. C., Lewandowski, A. S., Drotar, D., Quittner, A. L., & Walker, L. S (2008). Evidence-based Assessment of Health-related Quality of Life and Functional Impairment in Pediatric Psychology. *Journal of Pediatric Psychology, 33*(9), 983-996. doi:10.1093/jpepsy/jsn038

Prosser, L. A., & Corso, P. S. (2007). Measuring health-related quality of life for child maltreatment: a systematic literature review. *Health and Quality of Life Outcomes, 5*(1), 42. doi:10.1186/1477-7525-5-42

Rajmil, L., Herdman, M., Fernandez de Sanmamed, M. J., Detmar, S., Bruil, J., Ravens-Sieberer, U., . . . Auquier, P. (2004). Generic health-related quality of life instruments in children and adolescents: a qualitative analysis of content. *Journal of Adolescent Health, 34*(1), 37-45.

Rajmil, L., Herdman, M., Ravens-Sieberer, U., Erhart, M., & Alonso, J. (2014). Socioeconomic inequalities in mental health and health-related quality of life (HRQOL) in children and adolescents from 11 European countries. *International Journal of Public Health, 59*(1), 95-105. doi:10.1007/s00038-013-0479-9

Spinazzola, J., Hodgdon, H., Liang, L.-J., Ford, J. D., Layne, C. M., Pynoos, R., . . . Kisiel, C. (2014). Unseen wounds: The contribution of psychological maltreatment to child and adolescent mental health and risk outcomes. *Psychological Trauma: Theory, Research, Practice, and Policy, 6*(S1), S18.

Stafford, M., Kuh, D. L., Gale, C. R., Mishra, G., & Richards, M. (2016). Parent–child relationships and offspring's positive mental wellbeing from adolescence to early older age, *The Journal of Positive Psychology, 11*(3), 326-337, DOI: 10.1080/17439760.2015.1081971

Stevanovic, D. (2013). Impact of emotional and behavioral symptoms on quality of life in children and adolescents. *Quality of Life Research, 22*(2), 333-337. doi:10.1007/s11136-012-0158-y

Straus, M. A., Hamby, S. L., Finkelhor, D., Moore, D. W., & Runyan, D. (1998). Identification of child maltreatment with the Parent-Child Conflict Tactics Scales:

Development and psychometric data for a national sample of American parents. *Child Abuse and Neglect, 22*(4), 249-270.
U.S. Department of Health & Human Services. (2018). Child Maltreatment 2016. Retrieved from https://www.acf.hhs.gov/cb/research-data-technology/statistics-research/child-maltreatment
Vachon, D. D., Krueger, R. F., Rogosch, F. A., & Cicchetti, D. (2015). Assessment of the harmful psychiatric and behavioral effects of different forms of child maltreatment. *JAMA Psychiatry, 72*(11), 1135-1142. doi:10.1001/jamapsychiatry.2015.1792
Varni, J. W., Limbers, C. A., & Burwinkle, T. M. (2007). Impaired health-related quality of life in children and adolescents with chronic conditions: a comparative analysis of 10 disease clusters and 33 disease categories/severities utilizing the PedsQL™ 4.0 Generic Core Scales. *Health and Quality of Life Outcomes*, *5*(1), 43.
Ware, J. E. (2003). Conceptualization and measurement of health-related quality of life: Comments on an evolving field. *Archives of Physical Medicine and Rehabilitation, 84*(2), S43-S51.
Weber, S., Jud, A., & Landolt, M. A. (2016). Quality of life in maltreated children and adult survivors of child maltreatment: a systematic review. *Quality of Life Research, 25*(2), 237-255. doi:10.1007/s11136-015-1085-5
World Health Organization. (1948). *Constitution of the World Health Organization*. Geneva: World Health Organization.
Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The multidimensional scale of perceived social support. *Journal of Personality Assessment, 52*(1), 30-41.

Table 1. Characteristics of the study participants

Participant demographics, items measured	Mean (SD)/ n (%)
Adolescents' characteristics	
Age	18.3 (2.37)
Gender	
Female	309 (56.0%)
Male	243 (44.0%)
Behavioral problems (SDQ)	
Emotional problems	3.10 (2.24)
Peer problems	3.03 (1.45)
Conduct problems	2.18 (1.53)
Hyperactivity	3.37 (2.05)
Total difficulty	11.68 (5.13)
HRQoL (PedsQL)	
Physical	86.02 (13.58)
Emotional	73.83 (19.77)
Social	85.37 (16.23)
School	75.18 (17.37)
Total	80.10 (13.77)
Perceived social support (MSPSS)	
From significant others	5.65 (0.97)
From family	5.41 (1.00)
From friends	5.62 (0.96)
Total	5.56 (0.86)
Parents' characteristics	
Age	48.23 (6.95)
Gender	
Female	293 (83.7%)
Male	57 (16.3%)
Family income (USD)	2254.27 (1153.90)
Years of schooling	9.82 (3.27)
Preceding year child maltreatment (CTS-PC)	
Psychological aggression	185 (52.7%)
Neglect	89 (25.4%)
Corporal punishment	61 (17.4%)
Severe physical abuse	16 (4.6%)
Very severe physical abuse	11 (3.1%)

Table 2. Relationship between reported maltreatment and adolescents' behavioral problems (SDQ)

Types of maltreatment and behavioral problems reported	B (95% CI)	*p*	
Total difficulty			
Psychological aggression	0.63 (-0.43, 1.69)	0.24	
Corporal punishment	-0.05 (-1.41, 1.31)	0.94	
Severe physical abuse	2.30 (-0.21, 4.81)	0.07	
Very severe physical abuse	3.33 (0.58, 6.08)	0.02	*
Neglect	0.75 (-0.43, 1.93)	0.21	
Internalizing behaviors (emotional and peer problems)			
Psychological aggression	0.52 (-0.09, 1.12)	0.09	
Corporal punishment	0.32 (-0.46, 1.09)	0.42	
Severe physical abuse	1.92 (0.49, 3.35)	0.009	**
Very severe physical abuse	2.70 (1.15, 4.26)	< 0.001	***
Neglect	0.59 (-0.08, 1.26)	0.09	
Emotional problems			
Psychological aggression	0.37 (-0.09, 0.83)	0.11	
Corporal punishment	0.09 (-0.50, 0.67)	0.77	
Severe physical abuse	1.01 (-0.08, 2.09)	0.07	
Very severe physical abuse	1.45 (0.27, 2.64)	0.02	*
Neglect	0.36 (-0.15, 0.87)	0.16	
Peer problems			
Psychological aggression	0.15 (-0.14, 0.44)	0.32	
Corporal punishment	0.23 (-0.14, 0.60)	0.23	
Severe physical abuse	0.91 (0.23, 1.60)	0.009	**
Very severe physical abuse	1.25 (0.50, 2.00)	0.001	**
Neglect	0.23 (-0.09, 0.55)	0.17	
Externalizing behaviors (hyperactivity and conduct problems)			
Psychological aggression	0.11 (-0.50, 0.73)	0.72	
Corporal punishment	-0.37 (-1.15, 0.42)	0.36	
Severe physical abuse	0.38 (-1.08, 1.85)	0.61	
Very severe physical abuse	0.63 (-0.98, 2.23)	0.45	
Neglect	0.16 (-0.53, 0.85)	0.65	
Hyperactivity			
Psychological aggression	0.28 (-0.13, 0.69)	0.18	
Corporal punishment	0.04 (-0.49, 0.56)	0.89	
Severe physical abuse	0.28 (-0.69, 1.25)	0.57	
Very severe physical abuse	0.32 (-0.75, 1.38)	0.56	
Neglect	0.30 (-0.15, 0.75)	0.2	
Conduct problems			
Psychological aggression	-0.17 (-0.50, 0.17)	0.34	
Corporal punishment	-0.40 (-0.83, 0.03)	0.07	
Severe physical abuse	0.10 (-0.70, 0.90)	0.8	
Very severe physical abuse	0.31 (-0.57, 1.19)	0.49	
Neglect	-0.14 (-0.51, 0.24)	0.47	

Adjusted for age, gender, and family income

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

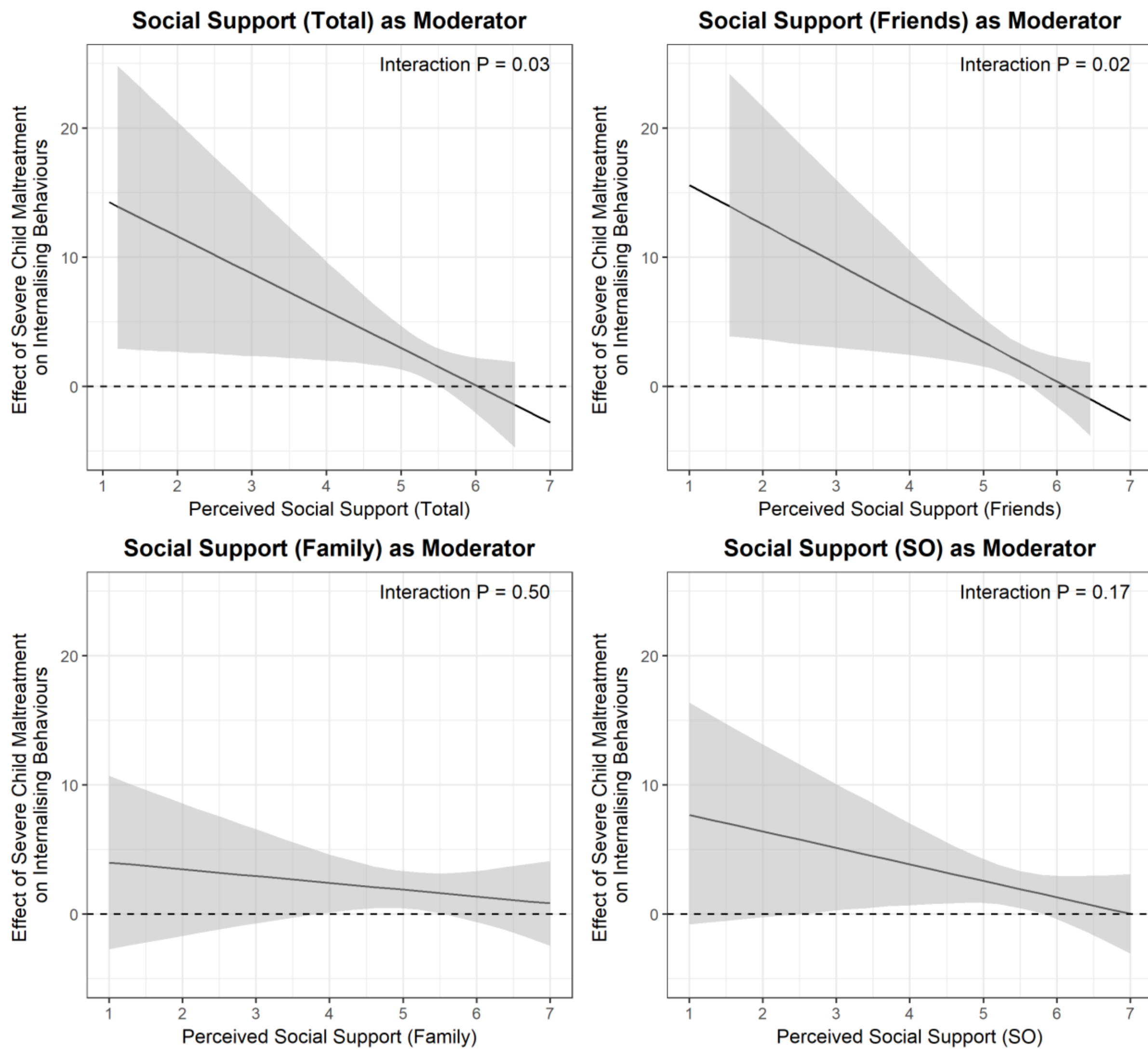
Table 3. Relationship between child maltreatment and child health-related quality of life (HRQoL)

Variable	B (95% CI)	*p*	
Adolescent HRQoL			
Psychological aggression	-3.96 (-6.94, -0.98)	0.01	**
Corporal punishment	-1.79 (-5.63, 2.05)	0.36	
Severe physical abuse	-5.77 (-12.90, 1.35)	0.11	
Very severe physical abuse	-5.96 (-13.78, 1.86)	0.14	
Neglect	-4.14 (-7.46, -0.82)	0.02	*
Physical well-being			
Psychological aggression	-3.16 (-6.22, -0.10)	0.04	*
Corporal punishment	-2.56 (-6.49, 1.37)	0.2	
Severe physical abuse	-2.30 (-9.62, 5.02)	0.54	
Very severe physical abuse	-2.42 (-10.45, 5.61)	0.56	
Neglect	-2.19 (-5.61, 1.23)	0.21	
Emotional well-being			
Psychological aggression	-4.06 (-8.19, 0.06)	0.05	
Corporal punishment	-1.93 (-7.23, 3.36)	0.47	
Severe physical abuse	-7.81 (-17.63, 2.01)	0.12	
Very severe physical abuse	-8.99 (-19.76, 1.78)	0.1	
Neglect	-4.82 (-9.40, -0.23)	0.04	*
Social well-being			
Psychological aggression	-5.26 (-8.60, -1.92)	0.002	**
Corporal punishment	-3.61 (-7.92, 0.70)	0.1	
Severe physical abuse	-9.16 (-17.15, -1.16)	0.03	*
Very severe physical abuse	-6.19 (-14.99, 2.62)	0.17	
Neglect	-6.15 (-9.86, -2.44)	0.001	**
School well-being			
Psychological aggression	-3.36 (-7.00, 0.29)	0.07	
Corporal punishment	0.94 (-3.73, 5.62)	0.69	
Severe physical abuse	-3.83 (-12.52, 4.86)	0.39	
Very severe physical abuse	-6.25 (-15.77, 3.28)	0.2	
Neglect	-3.39 (-7.44, 0.67)	0.1	

Adjusted for age, gender, and family income

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Figure 1. Social support moderated the relationship between child physical abuse and internalizing behaviors



Adjusted for age, gender, and family income. SO = significant others.