Unique and Combined Contribution of Peer Victimization and Maltreatment in Childhood to Young Adults' Anxiety, Depression, and Suicidality: A Cross-Sectional Study

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Abstract

Background

Child maltreatment and peer victimization are known to be major risk factors for depression and suicidal behavior. Furthermore, child maltreatment increases the risk for victimization by peers. Our objective was to distinguish the contribution of maltreatment by parents and peer victimization to mental health problems in young adulthood. Specifically, we tested whether peer victimization alone or in combination with parental maltreatment before 18 years was associated with anxiety, depression, and suicidal thoughts and behaviors at age 21 years.

Methods

We used data collected in the i-Share (internet-based students' health research enterprise) study in France from February 2013 to September 2019 (N = 2271 participants). We conducted multinomial and binary logistic regression analyses to assess the unique and cumulative contribution of peer victimization and parental maltreatment with anxiety, depression, and suicidality.

Results

Almost one third of students (28.8%) reported at least one mental health problem; 29.8% reported peer victimization only; 7.5% reported parental maltreatment only; and 10.3% reported both maltreatment and victimization. In multivariate models, compared to participants who did not experience maltreatment or peer victimization, those who experienced peer victimization only were more likely to present anxiety (aOR: 1.90; 95% CI: 1.50-2.40), depression (aOR: 1.95; 95% CI: 1.46-2.60), or suicidal ideation without (aOR: 1.62; 95% CI: 1.26-2.09) and with attempt (aOR: 2.70; 95% CI: 1.51-4.85). Similar associations were observed for those who were maltreated only. Those experiencing both maltreatment and peer victimization were at increased risk for depression (aOR: 2.63; 95% CI: 1.79-3.86) and for suicidal ideation with (aOR: 9.19; 95% CI: 4.98-16.92) and without attempt (aOR: 2.64; 95% CI: 1.86-3.76).

Conclusions

Individual and combined exposure to parental maltreatment and peer victimization in childhood or adolescence was associated with increased risk for anxiety, depression and suicidal behaviors. Peer victimization seems to have a specific role on mental health disorders not otherwise explained by polyvictimization. Since peer victimization is a frequent and evitable child abuse type, the findings have implications for policies to prevent and deal with.

Background

Child maltreatment and peer victimization in childhood are recognized as important risk factors for mental health problems worldwide [1, 2], including anxiety, depression, and suicidal behavior [3–8]. Child maltreatment includes all types of physical and/or emotional ill-treatment, sexual abuse, neglect, or negligence, which may result in actual or potential harm to the child's health, survival, development or dignity. It is generally perpetrated in the context of a relationship of responsibility, trust or power, as the parent-child relationship [1]. Prevalence estimates vary depending on the country, the definition used, and the assessment methods. In high-income countries, such as UK and USA, prevalence varies from 9–12% [9–11], although reliable statistics are missing for a large number of countries – including France [12]. Maltreatment by peers (i.e. victimization) during childhood is a multifaceted experience defined as harm caused by peers acting outside of the norms of appropriate conduct [13]. Prevalence estimates of peer victimization vary depending on samples, age cohorts and methodology [14]. According the WHO, across 38 countries or regions, one in three children report being bullied (a form of peer victimization involving an imbalance of power between victim and perpetrator) with a prevalence declining after the age of 11 years old [2].

Strong evidence from previous studies suggest that children experiencing maltreatment are at a higher risk of also being victimized by their peers [13, 15–19], and that experiencing both forms of interpersonal violence is associated with increased risk of mental disorder [20] compared to experiencing either maltreatment or peer victimization. Given the link between maltreatment and peer victimization and their long-term effects on mental health outcomes, it is relevant to investigate if peer victimization is

associated with mental health problems independently from maltreatment. Additionally, failing to take into account maltreatment when investigating the associations between victimization and mental health problems could also obscure of the potential combined effects of victimization on mental health outcomes [21]. Few studies analyzed association of peer victimization and maltreatment alone as well as their cumulative effect on mental health problems.

In the present study, our objective was to distinguish the role of two types of interpersonal violence during childhood on mental health problems in young adulthood. Specifically, we tested whether peer victimization alone or in combination with parental maltreatment before 18 years was associated with anxiety, depression, and suicidal thoughts and behaviors (STB), in a French young adult population at age 21 years.

Methods

Design, study population and data collection

Our study sample comprised participants of the ongoing, internet-based, Students 'Health Research Enterprise (i-Share) project, a prospective, population-based study of volunteer students in French-speaking universities and higher education institutions. Enrollment in the i-Share project started in 2013; to be eligible, a student had to be officially registered at a University or higher education institute, at least 18 years of age, able to read and understand French, and provide informed consent for participation. The i-Share enrolment procedure is described elsewhere [22]. The self-administered baseline questionnaire collected sociodemographic characteristics, health information, personal and familial histories, living conditions, and consumptions. For this cross-sectional retrospective study, we used the baseline questionnaire and a complementary questionnaire proposed after the inclusion. A compensation through 20 euros' gift card was given to volunteer students for completing this supplementary questionnaire for whom a part includes childhood adversity questions. For the present study, we used data from a sample of students who were included in the i-Share cohort study between February 2013 and September 2019, who participated in the complementary questionnaire, and for whom data on outcomes were available.

Measures

Outcome

Anxiety was measured using the Spielberger State-Trait Anxiety Inventory (STAI-Y) [23]. Range of scores is 20–80, the higher score indicating greater anxiety. Cut offs ranging between 39 to 55 have been suggested to detect clinically significant symptoms for anxiety [24, 25]. In our sample of young adult, we fixed the threshold at the third interquartile. Thus, we included "anxiety" as a binary variable defined as a STAI-Y score of 54 or higher.

Depression was measured using the 9-item Patient Health Questionnaire (PHQ-9), which is a reliable and valid measure of depression severity over the preceding two weeks. A PHQ-9 score of 5 indicated mild depression, 10 moderate depression, 15 moderately severe depression, and 20 severe depression. The 'depression' outcome was a binary variable defined as a PHQ-9 score of 15 or higher, reflecting moderate to severe levels of symptoms [26].

Suicidal thoughts and behaviors. The baseline questionnaire included questions about suicidal thoughts during the last 12 months and lifetime suicide attempts. This variable was categorized in three modalities: "no" included participants who did not reported having any STB (reference group), "suicidal thoughts without attempt" included participants who reported occasional or frequent suicidal thoughts in the last 12 without lifetime suicidal attempt, and "suicidal thoughts and attempt" included participants who reported occasional or frequent suicidal thoughts in the last 12 and lifetime suicidal attempt.

Any mental health problems. Participants with positive scores for either depression, anxiety or STB were coded as having 'any mental health problem' ('yes') and were compared to those who reported none of these problems ('no').

Exposure

Maltreatment and/or peer victimization were assessed by an adapted version of the Childhood trauma questionnaire (CTQ) [27].

Physical and psychological maltreatment were respectively investigated with the following questions: 1) In your childhood or adolescence, did you feel that you were physically abused (beatings, physical punishment...) by your parents? 2) In your childhood or adolescence, have you had the feeling of having been psychologically or emotionally abused (unfair and frequent criticism, mockery, insults, humiliation, etc.) by your parents?

Peer victimization was investigated with the question: In your childhood or adolescence, have you been harassed by other children (such as being regularly insulted or mocked or hit/shocked)? For all these questions, the answers “Never” and “Rarely” were considered as “No” and the answers “Sometimes”, “Often”, and “Very often” were coded as “Yes”. The exposure variable Maltreatment and/or peer victimization was coded as follows: “None” included participants who answered no for any maltreatment and peer victimization, “Peer victimization only” for those who reported only peer victimization without any maltreatment, “Maltreatment only” for those who reported any maltreatment without peer victimization and, “Both” for participants who reported having been maltreated and victimized by peers in childhood and adolescence.

Covariates

We adjusted for potential confounders relative to childhood adversities identified in the literature as associated to mental health outcomes and exposure variable. Thus, the following self-reported covariates were considered in the analyses: age, gender (male, female), parental divorce or separation (yes, no), parental depression or anxiety history (yes, no), parental alcohol abuse history (yes, no), parental education level (university studies, non-university studies), and difficult economic status in childhood (yes, no).

Statistical analyses

We first described the overall study sample and according to the categories of the exposure variable (peer victimization only, maltreatment only, both maltreatment and peer victimization, none). Continuous variables are expressed as mean $\pm$ standard error. Categorical variables are described as count and proportion. The Kruskal-Wallis test was used to compare the distributions of age in the groups of exposure variable. Proportions were compared with the Chi-square test.

We measured the association between maltreatment and/or peer victimization and other binary outcomes i.e. “anxiety”, “depression” or “any mental health problems” using binary logistic regression analysis, estimating adjusted odds ratios (OR) with 95% confidence intervals (CI). As STB is a categorical variable with 3 modalities, multinomial logistic regression models were utilized to assess its relationship with exposure variable. Models convergences were checked. The assumption of linearity of the logit was tested for the continuous variable, age, in each model. The fully adjusted analyses took into account all selected covariates. In each model, to account for missing information for covariates we used MICE (multiple imputation by chained equation) method [28]. We performed 10 imputations, and averaged the variable estimates to produce a mean estimate. Finally, we verified that the relative efficiency of the imputation on each variable was greater than 95%. Then, to test the cumulative effect of both maltreatment and victimization on mental health outcomes compared to peer victimization only and maltreatment only, we conducted the same analyses, changing the reference categories.

Finally, the attributable fraction (AF) was defined as the proportion of each mental health outcome attributable to peer victimization or child maltreatment or both, calculated as follows: $AF = [p \cdot (aOR - 1)] / [1 + (p \cdot (aOR - 1))]$ where p represents the prevalence of the risk factor in our study sample and aOR , the adjusted odds ratio related to the association between the risk factor and the outcome in multivariate models after imputation on missing data.

All analyses were performed using SAS version 9.4. Two-sided P values of < 0.05 were considered statistically significant.

Results

Of the 2476 students that fully completed the baseline and childhood adversity questionnaires, 205 were excluded because they presented missing data for the outcomes. The final study population included 2271 students. Mean age of the participants was 21.0 years (± 2.6) and about three quarters were female ($n = 1782$; 78.5%). Among them, almost one third of students reported at least one mental health problem ($n = 654$; 28.8%): 22.4% ($n = 509$) reported anxiety, 13.6% ($n = 308$) presented depression symptoms, and 18.3% ($n = 415$) reported 12-month suicidal ideation without lifetime suicidal attempt and 4.0% ($n = 91$) with attempt. **Table 1** shows the sample characteristics, both overall and categorized by peer victimization, maltreatment and both.

Almost one third of the sample (n=677; 29.8%) was exposed to peer victimization only, 7.5% (n=170) to maltreatment only, and 10.3% (n=233) to both maltreatment and peer victimization. Participants being maltreated only or both maltreated and victimized by peers were more likely to declare negative family events, such as parental divorce, parental depression history or alcohol abuse history compared to those with none adversity or victimized by peers only.

Table 2 presents the adjusted logistic regression models reporting associations between maltreatment and/or peer-victimization and mental health outcomes after multiple imputation on covariates missing data. Relative to participants who did not experience any maltreatment or peer victimization, those who experienced peer victimization only were at increased odds of anxiety (aOR: 1.90; 95% CI: 1.50-2.40), depression (aOR: 1.95; 95% CI: 1.46-2.60) and suicidal ideation without (aOR: 1.62; 95% CI: 1.26-2.09) and with attempt (aOR: 2.70; 95% CI: 1.51-4.85). Similar associations were observed for children exposed to maltreatment only. Participants experiencing both maltreatment and peer victimization were also more likely to present any mental health problems (aOR: 2.94; 95% CI: 2.17-4.00), depression (aOR: 2.63; 95% CI: 1.79-3.86), or suicidal thoughts with attempt (aOR of 9.19; 95% CI: 4.48-19.92) compared to participants not experiencing maltreatment or peer-victimization.

Additionally, we found an interaction between exposure interpersonal violence and gender ($p < 0.0001$) indicating that girls were at higher risk of STB and boys at higher risk for depression and anxiety when they are exposed to any form of interpersonal violence. However, due to a small number of boys in some exposure categories, we were not able to stratify the analyses by gender.

Table 3 presents the mental health outcomes of participants' exposure to both forms of interpersonal violence compared to those to exposed to peer victimization only or maltreatment only. For children experiencing both maltreatment and peer victimization, associations were not significantly more important than those observed for children exposed to maltreatment only, except for suicidal thoughts with attempts (aOR: 3.65; 95% CI: 1.60-8.33). Compared to children exposed to peer victimization only, those experiencing both maltreatment and peer victimization were more likely to report any mental health problems (aOR: 1.60; 95% CI: 1.17-2.19) and suicidal thoughts with or without attempts but associations with depression and anxiety were not significantly more important.

AFs ranged from 6.0% to 45.8% (Table 4) in our sample study. We observed that for the outcome any mental health disorders, the AF for peer victimization only was larger than the AF for maltreatment only. The AFs for peer victimization only are closer to those for both maltreated and victimized than those for maltreatment only. For example, 20.0% of any mental health disorder and 15.6% of suicidal ideation without attempt could be attributed to peer victimization, while the corresponding AFs for maltreatment were 8.1% and 7.5% and those for both maltreatment and peer victimization were 16.7% and 14.5%.

Discussion

Main findings and interpretation

In this cross-sectional study of 2271 French young adults, we found an increased risk of mental health problems in young adulthood including anxiety, depression and STB in people who were victimized by peers whether or not they were exposed to parental child maltreatment. Overall, for children experiencing both maltreatment and peer victimization, associations were not significantly more important than for those exposed to either maltreatment or peer victimization - except for suicidal thoughts with attempts.

The prevalence rates of peer victimization and maltreatment in our sample are close to those estimated in previous studies [2, 9-11]. Peer victimization only is highly prevalent as it concerns one third of the sample which explain large AFs comparable to those of combined maltreatment and peer victimization.

Our results suggest the important independent role of peer victimization and are in line with other studies [29]. A longitudinal study highlighted that being the victim of peer victimization has an independent effect on young adults' mental health, and being victimized by peers had worse long-term adverse effects on young adults' mental health than being maltreated [30]. Previous research also shows the important effect of peer victimization on mental health problems, as children experiencing bullying victimization had similar risk of negative mental health outcomes than children who were placed in public or substitute care [31].

Studies showed that parental support and positive familial relationship in childhood have long term positive effects on adult mental health and provide a crucial foundation for social interactions [32,33]. Thus, parental maltreatment in childhood increase the likelihood of children to be victimized by their peers owing to impairment of children' emotional regulation skills [34]. Indeed, attachment theory, highlights how children internalize aspects of caregiving relationships and this experience impair later peer interactions [35]. It is worth noting that maltreatment and peer victimization refer to experiences of interpersonal violence occurring in two different environmental contexts – the home and the school, respectively. It is possible that some individuals who experience maltreatment in the home environment consider themselves to be victims regardless of the context. However, our results show that associations between peer victimization and mental health outcomes were not fully explained by exposure to both types of interpersonal violence. Moreover, these associations remain significant even after controlling for important familial variables. This stresses the importance of interpersonal experiences occurring outside the family sphere, and with peers specifically, which seem to have a specific role on mental health. As children grow-up, peer interactions became increasingly important. Repetitive verbal or physical harassment or exclusion from peers might have long term effects independently of other childhood adversity, modifying stress responses [36]. Furthermore, our findings suggest than cumulative maltreatment effects may be at least partly due to being victimized. Thus, future studies of maltreatment should also take into account peer victimization.

Strengths and limitations

The present study had some important strengths, including large and contemporaneous sample of French young adults, a study population never investigated on this subject. We also note the consistency of our results with previous studies, and the ability to adjust for a range of confounders due to the wide range of available variables. Depression and anxiety were measured using validated scales with excellent psychometric properties and exposures were measured with an adapted version of the CTQ. Furthermore, a significant association of peer victimization only was found for each mental health outcome, providing consistent results. Despite these strengths, several limitations should be considered when interpreting the results. First, it was a cross-sectional analysis; therefore, we could not strictly separate the timing of exposure, outcome, and covariates and no causality could be inferred between exposure and mental health outcomes. Second, the voluntary participation of students at baseline and in the supplementary questionnaire may have introduced a self-selection bias, although it is difficult to see how this potential bias could have influenced the results. Third, the information was self-reported, which could lead to an information bias, particularly memory bias as exposure assessment was retrospective. Fourth, there is an over-representation of women in our sample compared to the 56% of female students in France and our results suggest differences between gender according mental health problems and maltreatment exposure. Finally, we could not investigate the age of onset of peer victimization and maltreatment and the type of peer victimization.

Conclusions

In a large sample of young adults, individual and combined exposure to parental maltreatment and peer victimization in childhood or adolescence was associated with increased risk for mental health problems. Peer victimization seems to have a specific role on mental health problems over and beyond the role of the exposure to maltreatment. Since peer victimization is frequent but preventable, these findings stress the importance of coordinating the responses of schools, teachers, health services and public policies to address this widespread problem.

Abbreviations

AF: Attributable fraction; aOR: Adjusted odds ratio; CI: Confidence interval; i-Share: Internet-based Students' Health Research Enterprise; MICE: Multiple imputation by chained equation; OR: Odds ratio; SD: Standard deviation; UK: United Kingdom; USA: United States of America; WHO: World Health Organization.

Declarations

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Authors' contributions

MM, CT, and SMC designed the study. MM conducted the statistical analysis. MM, MO, CT and SMC wrote the first draft of the manuscript. All co-authors had full access to the data, read, revised, and approved the final manuscript.

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study; in the collection, analyses, or interpretation of data; in writing the manuscript; or in the decision to publish the results.

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Ethics approval and consent to participate

The i-Share project was approved by the "Commission nationale de l'informatique et des libertés" (National Commission of Informatics and Liberties, Reference DR-2013-019). All methods were carried out in accordance with relevant guidelines and regulations. Informed consent was obtained from all participants. Students were informed on the nature and purpose of the study and provided on-line consent.

Consent for publication

Not applicable

Competing interests

The authors declare that they have no competing interests.

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Tables

Table 1 Characteristics of the study sample overall and according to child maltreatment or peer victimization.

	All sample (N=2271)		Child maltreatment or Peer victimization								P- value*
			None (N=1191; 52.4%)		Peer victimization only (N=677; 29.8%)		Child maltreatment only (N=170; 7.5%)		Both (N=233; 10.3%)		
Age (Mean, SD)	21.0	2.6	21.0	2.4	20.8	2.4	21.3	2.4	21.2	3.8	0.170
Gender											0.095
Male	489	21.5	265	22.3	152	22.5	24	14.1	48	20.6	
Female	1782	78.5	926	77.8	525	77.6	146	85.9	185	79.4	
Perceived parental support ^a											<.0001
Strong to extremely strong	1709	76.1	991	83.8	534	79.6	80	48.8	104	45.4	
Moderate	389	17.3	155	13.1	117	17.4	44	26.8	73	31.9	
Low or None	148	6.6	36	3.1	20	3.0	40	24.4	52	22.7	
Parental divorce or separation ^b	674	30.4	314	26.9	191	29.0	72	44.7	97	42.5	<.0001
Parental education level ^c											0.024
University studies	1227	54.9	656	55.9	381	57.3	81	48.5	109	47.8	
Non university studies	1007	45.1	518	44.1	284	42.7	86	51.5	119	52.2	
Parental depression or anxiety history ^d	897	44.5	390	36.1	275	46.2	91	64.1	141	69.8	<.0001
Parental alcohol abuse history ^e	218	10.2	85	7.5	56	8.6	26	16.7	51	25.3	<.0001
Difficult economic status during childhood ^f	151	6.7	52	4.4	46	6.8	15	8.8	38	16.3	<.0001
Missing : a=25; b=55; c=38; d=253; e=138; f=1											
All data presented as n (%) unless otherwise noted (SD: Standard deviation).											
* P Values are based on Kruskal-Wallis test for continuous variable and Chi2 test for categorical variables											

Table 2 Associations between mental health outcomes and child maltreatment and/or peer victimization (N=2271).

Maltreatment or Peer victimization	Suicidal thoughts without attempt		Suicidal thoughts with attempt		Depression		Anxiety		Any mental health problems	
	n	OR (95% CI)	n	OR (95% CI)	n	OR (95% CI)	n	OR (95% CI)	n	OR (95% CI)
None	162	1(reference)	20	1(reference)	109	1(reference)	188	1(reference)	246	1(reference)
Peer victimization only	140	1.62 (1.26-2.09)	29	2.70 (1.51-4.85)	112	1.95(1.46-2.60)	183	1.90 (1.50-2.40)	225	1.84 (1.48-2.29)
Maltreatment only	45	2.08 (1.41-3.07)	8	2.54 (1.08-6.00)	31	1.85 (1.18-2.91)	54	2.16 (1.49-3.13)	69	2.18 (1.54-3.09)
Both	68	2.64 (1.86-3.76)	34	9.19 (4.98-16.92)	56	2.63 (1.79-3.86)	84	2.62 (1.89-3.64)	114	2.94 (2.17-4.00)
OR: odds ratio, CI: confidence interval										
Adjusted for age, gender, parental divorce or separation, difficult economic status during childhood, parental depression or anxiety, parental alcohol abuse and parental education level after multiple imputation.										

Table 3 Associations between mental health outcomes and child maltreatment only or peer victimization only vs both maltreatment and peer victimization.

Maltreatment or Peer victimization vs Both	Suicidal thoughts without attempt		Suicidal thoughts with attempt		Depression		Anxiety		Any mental health problems	
	n	OR (95% CI)	n	OR (95% CI)	n	OR (95% CI)	n	OR (95% CI)	n	OR (95% CI)
Model 1 (N=910)										
Peer victimization only	140	1(reference)	29	1(reference)	112	1(reference)	183	1(reference)	225	1(reference)
Both	68	1.64 (1.18-2.35)	34	3.41 (1.95-5.97)	56	1.35 (0.92-1.98)	84	1.38 (0.99-1.93)	114	1.60 (1.17-2.19)
Model 2 (N=403)										
Maltreatment only	45	1(reference)	8	1(reference)	31	1(reference)	54	1(reference)	69	1(reference)
Both	68	1.28 (0.81-2.03)	34	3.65 (1.60-8.33)	56	1.41 (0.86-2.35)	84	1.22 (0.79-1.87)	114	1.35 (0.90-2.03)
OR: odds ratio, CI: confidence interval										
Adjusted for age, sex, parental divorce or separation, difficult economic status during childhood, parental depression or anxiety, parental alcohol abuse and parental education level after multiple imputation.										

Table 4 Attributable fractions (%) of child maltreatment and/or peer victimization for mental health outcomes.

	Suicidal thoughts without attempt	Suicidal thoughts with attempt	Depression	Anxiety	Any mental health problems
Peer victimization only	15.6	33.6	22.0	21.1	20.0
Maltreatment only	7.5	10.4	6.0	8.0	8.1
Both	14.5	45.8	14.4	14.3	16.7