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The co-occurrence of depression and dissociation: The relevance of childhood trauma

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ABSTRACT

Recent studies showed that dissociation may be common and persistent in people with depression. Dissociation also predicts subsequent depressive symptoms. Both conditions have been linked with trauma exposure. Yet, little is known about the co-occurrence of depression and dissociation. This multi-sample study investigated the co-occurrence of depressive and dissociative symptoms and its relationship with different types of childhood trauma. We analyzed available data from five samples of Chinese adults (N = 2737 in total). Participants completed the same set of measures of depressive and dissociative symptoms and childhood betrayal and non-betrayal trauma. Across samples, between 22.0% and 50.6% of participants with depression exhibited co-occurring dissociation; the majority of participants with dissociation (67.0%–90.2%) presented with depression too. One-way ANCOVA showed that participants who presented with both depression and dissociation reported a statistically significantly higher number of childhood betrayal and non-betrayal trauma types compared to those who had only one or none of these conditions. Exploratory mediation analysis also revealed that dissociative symptoms partly mediated the relationship between childhood trauma and depressive symptoms, regardless of the type of trauma. Findings suggest that the co-occurrence of depressive and dissociative symptoms is associated with childhood trauma. Individuals who report depressive symptoms or seek treatments for a depressive disorder should be screened for dissociation. Further studies on the reliability, validity, clinical features, and intervention needs of the possible dissociative subtype of depression are required.

1. The co-occurrence between depression and dissociation: The relevance of childhood trauma

1.1. Depression as a heterogeneous condition

Depression is one of the largest factors contributing to disability worldwide (Ferrari et al., 2013; Smith, 2014). Approximately 4.4% of the global population suffer from a depressive disorder (World Health Organization, 2017). While evidence-based treatments are available (e.g. antidepressants and cognitive behavioral therapy), responses to such treatments can vary widely and relapse is also common (Gaynes et al., 2020; Richards, 2011). To improve treatment outcomes, it has been

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recommended that subtypes of depression be identified and that personalized care be provided (Maj et al., 2020). The concept of depression as a heterogeneous condition has long been acknowledged in the literature (Goldberg, 2011; Winokur, 1997). The identification of depression subtypes holds potential for informing personalized treatments, as different subtypes may involve different etiological factors and require different interventions (Rantala et al., 2018). Depression is a complex and heterogeneous condition (Shahar, 2024), and some subtypes of depression might result from trauma and trauma-related symptoms (Fung et al., 2023a; Şar, 2011).

1.2. A possible trauma-related dissociative subtype of depression

One proposal that has recently created interest is a trauma-related dissociative subtype of depression (Firoozabadi et al., 2019; Şar, 2015; Şar et al., 2013). Dissociation refers to failures in the process of integrating one's biopsychosocial experiences, such as emotions, memories, and behaviors, and dissociation has been recognized in DSM and ICD for several decades (American Psychiatric Association, 2013; World Health Organization, 2019). Examples of clinically significant dissociative symptoms include amnesia for trauma-related memories, depersonalization, derealization, dissociative intrusions (e.g., flashbacks), and identity alteration (Dell, 2006). In addition, functional neurological (conversion) symptoms and maladaptive daydreaming have also been recognized as involving dissociative processes (Nijenhuis, 2001; Somer et al., 2021). Dissociation has been conceptualized as a response to traumatization (Loewenstein, 2018; Nijenhuis and Van der Hart, 2011) and it was found to be associated with childhood trauma across cultures (Kate et al., 2020). In particular, the link between childhood betrayal trauma and dissociation has been emphasized (Freyd, 1996). Betrayal trauma refers to a traumatic event perpetrated by a close person, such as a caregiver or an attachment figure (Freyd, 1996, 2008). Dissociation may be especially required as a coping strategy in the context of betrayal trauma, in which the survivor can hardly escape from the ongoing traumatic event (Fung et al., 2023b; International Society for the Study of Trauma and Dissociation, 2020). In order to survive, the survivor needs to protect the relationship and remain attached to the caretaker-perpetrator, and therefore the painful memories and emotions related to the betrayal trauma need to be dissociated (Freyd et al., 2007). Recent studies have confirmed that dissociative symptoms were more strongly associated with childhood betrayal trauma than with non-betrayal trauma (Fung et al., 2023b; Wu et al., 2022). In fact, the dissociative subtype of post-traumatic stress disorder (PTSD) has already been recognized in DSM-5. Given that over 50% of people with depression have been exposed to traumatic experiences during childhood (Xie et al., 2018) and that trauma-related symptoms and depression are highly correlated (Flory and Yehuda, 2022), it is likely that individuals who exhibit both depressive and dissociative symptoms would have experienced more traumatic events, especially childhood betrayal trauma.

1.3. The co-occurrence of depression and dissociation

It has long been observed that over 80% of patients with severe dissociation (i.e., dissociative identity disorder) have experienced major depression (Ross et al., 1990; Şar et al., 1996). Individuals with dissociation tend to exhibit higher scores on depression scales compared to individuals with depression but without dissociation (Fung et al., 2020a). Additionally, recent studies found that 60% of participants with depression suffered from comorbid dissociative symptoms and that dissociation persisted over time in this population (Fung et al., 2023a). A longitudinal study further showed that dissociative symptoms predicted subsequent depressive symptoms, but not the other way around (Fung and Cheung, 2024). These data support the theory that a dissociative subtype of depression may exist (Şar, 2015) and that this subtype may be associated with more impairments or service needs (Fung and Chan, 2019).

1.4. Research gaps and the present study

However, there is a lack of studies that have systematically investigated the co-occurrence of depression and dissociation. There are very few studies that have reported the rates of depression in people with dissociation (Şar et al., 1996), or the rates of dissociation in people with depression (Fung et al., 2022a; Şar et al., 2013). Additionally, although Şar (2015) proposed that dissociative depression may be particularly related to trauma and stress, and although dissociation is generally associated with childhood trauma and adversities (Cheung et al., 2023; McHugh and Egan, 2023; Van Dijke et al., 2015), it remains unclear whether the co-occurrence of depression and dissociation is characterized specifically by higher levels of childhood trauma, especially betrayal trauma.

Against this background, we conducted a multi-sample study. We analyzed standardized assessment data from all available datasets that included the same set of measures from Chinese-speaking adults in order to answer two primary research questions: 1) What were the rates of co-occurrence between depression and dissociation? 2) Would participants who exhibited both depression and dissociation report higher levels of childhood trauma compared to those with either or neither of these conditions. Furthermore, given the link between childhood betrayal trauma and dissociative symptoms, we conducted analyses for childhood betrayal and non-betrayal trauma separately. We hypothesized that the co-occurrence between depression and dissociation would be associated with childhood betrayal trauma in particular.

In addition to these two primary research questions, we further conducted exploratory analyses to examine the extent to which the relationship between childhood trauma and depressive symptoms could be explained (mediated) by dissociative symptoms. We propose that dissociative symptoms resulting from childhood trauma could be distressing to the point that they could worse depressive symptoms (Şar, 2014, 2015). As mentioned, this hypothesis is supported by a recent longitudinal study, in which we found that dissociative symptoms predicted subsequent depressive symptoms, but not the other way around (Fung and Cheung, 2024). Therefore, in the present study, we further explored the extent to which dissociative symptoms could explain the relationship between childhood trauma and depressive symptoms, while considering the potential differences between betrayal and non-betrayal trauma.

2. Methods

2.1. Participants and settings

Five independent samples of Chinese-speaking adults completed the same set of measures of childhood trauma, depressive symptoms, and dissociative symptoms. Therefore, we conducted secondary analyses of all available survey data from these five projects. Sample 1 consists of 789 Chinese-speaking adults (mainly living in Taiwan and Hong Kong) (Fung and Cheung, 2024). Sample 2 consists of 867 mothers living in Taiwan who had a child aged between 6 and 18 (Lee et al., 2023). Sample 3 consists of 484 college students living in Taiwan. Sample 4 consists of 220 Chinese-speaking adults (mainly living in Taiwan and Hong Kong). Sample 5 consists of 377 community health service users who received services from a Registered Chinese Medicine Practitioner (RCMP) within the past three months in Hong Kong (Fung et al., 2023d). All participants were recruited in 2022–2023 through the utilization of social media advertising on Facebook and Instagram. In addition to online recruitment, participants in Sample 5 were also recruited in several traditional Chinese medicine clinics in Hong Kong. The projects that recruited Sample 1 and Sample 4 obtained ethical approval from the institutional review board at the Hong Kong Baptist University, while the projects that recruited Sample 2 and Sample 3 obtained ethical

approval at National Tsing Hua University, Taiwan. The project for Sample 5 obtained ethical approval at the Chinese University of Hong Kong.

All participants provided online informed consent before they completed the surveys. The methodology used to recruit the samples has been reported elsewhere (Fung et al., 2023a; Fung and Cheung, 2024; Lee et al., 2023), except for Sample 4. The sample characteristics are reported in Table 1.

2.2. Measures

Participants in each sample completed standardized Chinese self-report measures of depression, dissociation, and childhood trauma through online surveys. The online survey also included questions regarding demographic backgrounds and attention checking items (e.g., 3 + 4 = ?).

Childhood trauma was assessed using the 12-item Childhood Trauma Subsection of the Brief Betrayal Trauma Survey (BBTS-C). The BBTS is a reliable measure that assesses exposure to 12 different types of traumatic events during both childhood (before 18 years old) and adulthood (after 18 years old) (Goldberg and Freyd, 2006). The BBTS was reported to have good test-retest reliability in previous samples (Fung et al., 2022b). According to Freyd et al. (2005), the traumatic events assessed on the BBTS can be divided into betrayal and non-betrayal trauma. An example of betrayal trauma is "Witnessed someone with whom you were very close deliberately attack another family member so severely as to result in marks, bruises, blood, broken bones, or broken teeth." An example of non-betrayal trauma is "You were deliberately attacked that severely by someone with whom you were not close." The present study only analyzed data regarding traumatic events that occurred before the age of 18.

Depressive symptoms were assessed using the Patient Health Questionnaire (PHQ-9), which is a commonly used measure of DSM depressive symptoms (Indu et al., 2018; Kroenke and Spitzer, 2002). A meta-analysis suggested that a cutoff score of 10 demonstrates acceptable diagnostic properties for detecting major depression (Manea et al., 2012). Therefore, the presence of depression was defined as having a score of 10 or above on the PHQ-9. The PHQ-9 has been used in Chinese studies with good psychometric properties (Wang et al., 2014; Yeung et al., 2008). In the combined sample, the PHQ-9 had excellent internal consistency (α = .917).

Dissociative symptoms were assessed using the Dissociative Features Section of the Self-Report Dissociative Disorders Interview Schedule (SR-DDIS-DF). The DDIS is a well-validated diagnostic instrument for DSM dissociative symptoms and disorders (Ross et al., 1989). The Dissociative Features Section, which includes 16 items measuring psychoform dissociative symptoms, could differentiate between individuals with and without dissociative disorders (Ross and Ellason, 2005). The self-report version of the DDIS performed equally well in clinical settings (Ross and Browning, 2017). The mean scores on the SR-DDIS-DF were 1.22 and 1.76 in two Chinese student samples (Fung et al., 2020b, 2023c). Previous studies in the Chinese context suggested that a cutoff score of three could be used to detect pathological dissociation (Fung et al., 2018). Therefore, the presence of dissociation was defined as having a score of 3 or above on the SR-DDIS-DF. In the combined sample, the SR-DDIS-DF had good internal consistency (α = .778).

Table 1
Sample characteristics and the rates of depression and dissociation.

Sample characteristics	Sample 1 (N = 789 Chinese-speaking young adults)	Sample 2 (N = 867 mothers in Taiwan)	Sample 3 (N = 484 college students in Taiwan)	Sample 4 (N = 220 Chinese-speaking adults)	Sample 5 (N = 377 community health service users)	Combined sample (N = 2737)
Age (range)	18 to 24	27 to 56	18 to 30	18 to 73	18 to 64	18 to 73
Age (Mean/SD)	21.0 (2.00)	39.9 (2.89)	20.3 (1.95)	32.3 (14.3)	40.5 (12.6)	30.5 (11.5)
Gender (Female)	83.9%	100%	72.7%	80.0%	80.9%	86.3%
Location	88.3% Taiwan; 9.1% Hong Kong	100% Taiwan	100% Taiwan	69.1% Taiwan; 27.3% Hong Kong	100% Hong Kong	80.6% Taiwan; 18.6% Hong Kong
Having a bachelor's degree	37.2%	81.8%	N/A	68.6%	53.1%	49.5%
Married or common-law	1.6%	88.0%	2.3%	18.6%	40.1%	35.8%
Current use of psychiatric services[a]	26.8%	9.7%	25.8%	28.6%	11.1%	17.3%
Exposed to childhood trauma (BBTS-C ≥ 1)	82.2%	56.2%	70.0%	68.6%	60.5%	73.7%
Number of childhood trauma (BBTS-C Mean/SD)	2.62 (2.30)	2.12 (2.04)	2.05 (2.4)	2.24 (2.38)	1.50 (1.84)	2.18 (2.16)
Depressive symptoms (PHQ-9 Mean/SD)	14.0 (6.6)	8.31 (6.87)	11.2 (7.47)	11.6 (7.52)	11.2 (6.98)	11.1 (7.32)
Dissociative symptoms (SR-DDIS-DF Mean/SD)	2.03 (2.54)	0.94 (1.49)	2.39 (2.75)	2.29 (2.66)	1.07 (1.57)	1.64 (2.28)
Rates of depression and dissociation						
None	24.8%	60.2%	38.8%	35.0%	43.2%	41.9%
Depression only (PHQ-9 ≥ 10)	45.2%	27.9%	26.0%	31.4%	43.2%	35.0%
Dissociation only (SR-DDIS-DF ≥ 3)	3.7%	3.9%	8.5%	5.5%	1.3%	4.4%
Depression + Dissociation	26.2%	8.0%	26.7%	28.2%	12.2%	18.7%
Rates of co-occurrence						
Dissociation in participants with depression	36.7%	22.2%	50.6%	47.3%	22.0%	34.9%
Depression in participants with dissociation	87.7%	67.0%	75.9%	83.8%	90.2%	80.9%

Notes.
BBTS-C = Childhood Trauma Subsection of the Brief Betrayal Trauma Survey; PHQ-9 = the Patient Health Questionnaire-9; SR-DDIS-DF = the Dissociative Features Section of the Self-Report Dissociative Disorders Interview Schedule.
[a] In Sample 1 and 5, we asked whether the participants had seen a psychiatrist in the past 12 months; In Sample 2, 3, and 4, we asked whether the participants were currently seeing a psychiatrist.

2.3. Data analysis

SPSS 27.0 was used for statistical analysis. We first conducted descriptive analyses of the rates of depression and dissociation. We then conducted one-way ANCOVA to investigate the mean differences in the number of types of childhood betrayal and non-betrayal trauma, as measured by the BBTS-C, in the combined sample, while including age and gender as the covariates.

For the exploratory mediation analysis, we conducted a path analysis to examine the mediation (indirect) effect of dissociative symptoms in the association between childhood trauma and depressive symptoms. In the path model, childhood betrayal and non-betrayal trauma were entered as independent variables simultaneously and the PHQ-9 score was entered as the dependent variable, with the SR-DDIS-DF score modelled as the mediator. Age and gender were added as covariates in the model. The path model was estimated using restricted maximum likelihood to handle the non-normality of the distribution of the variables. All variances and covariances were modelled to achieve a saturated model with a perfect model fit. The indirect effect via dissociative symptoms was computed with the product of coefficient approach, separately for each type of trauma. The significance of the indirect effects was examined with Sobel's test (Sobel, 1982). The path model was estimated with R package lavaan version 0.6–17 (Rosseel, 2012).

3. Results

In all five samples, the rates of probable depression (PHQ-9 $\geq$ 10) ranged from 35.9% to 71.4%, while the rates of probable dissociation (SR-DDIS-DF $\geq$ 3) ranged from 11.9% to 35.2%.

As shown in Table 1, across the five samples, 22.0%–50.6% of participants with depression exhibited co-occurring dissociation. Additionally, 67.0%–90.2% of participants with dissociation exhibited co-occurring depression. Rates of respondents with depression only were 26.0%–45.2% across samples; respondents reporting dissociation without depression was relatively rare (1.3%–8.5%).

In the combined sample (N = 2737), 35.0% screened positive for depression only, 4.4% screened positive for dissociation only, and 18.7% screened positive for both depression and dissociation. Among participants who screened positive for depression (n = 1470), 34.9% exhibited co-occurring dissociative symptoms. Among participants who screened positive for dissociation (n = 634), 80.9% exhibited co-occurring depressive symptoms.

In the combined sample, one-way ANCOVA showed that participants who screened positive for both depression and dissociation reported the highest number of both childhood betrayal and non-betrayal trauma types, even after controlling for the effects of age and gender (see Table 2). Those who reported both conditions also reported significantly more betrayal and non-betrayal trauma types compared with those who reported neither condition. However, the number of trauma types did not significantly differ between those who reported only depression or disassociation.

The estimated path model can be found in Fig. 1. Both types of childhood trauma were associated with dissociative symptoms (betrayal: B = 0.30, p < .001, β = 0.18; non-betrayal: B = 0.55, p < .001, β = 0.24), which were associated with depressive symptoms (B = 1.05, p < .001, β = 0.33). The indirect effects of the trauma-depression association via dissociation were significant for both betrayal (ab = 0.32, Z = 7.13, p < .001) and non-betrayal trauma (ab = 0.57, Z = 8.72, p < .001). The path model explained 26.8% and 18.1% of the variance of depression and dissociation, respectively.

4. Discussion

This multi-sample study provides systematic data regarding the co-occurrence of depressive and dissociative symptoms. We observed that 34.9% of participants with depression exhibited co-occurring dissociative symptoms; 80.9% of participants with dissociation also screened positive for depression. Additionally, compared with those without depression and dissociation and those with depression or dissociation only, participants with both depression and dissociation reported statistically significantly more types of both childhood betrayal and non-betrayal trauma.

We provide important data showing that the majority of dissociative individuals suffer from depressive symptoms, while a significant subgroup of individuals with depression also suffers from dissociative symptoms. The co-occurrence of depression and dissociation is characterized by higher levels of childhood trauma, regardless of their types (e.g., betrayal vs non-betrayal) in our sample. Although the present study does not offer direct evidence supporting the existence of a dissociative subtype of depression (Firoozabadi et al., 2019; Fung and Chan, 2019; Şar, 2015), the results do suggest that the levels of childhood trauma tend to be higher among those with co-occurring depressive and dissociative symptoms. In addition, our exploratory mediation analysis further showed that dissociative symptoms partly explained the relationship between childhood trauma and depressive symptoms, regardless of the type of trauma (betrayal or non-betrayal). Given the association between the co-occurrence of depressive and dissociative symptoms and childhood trauma, the results have significant implications for the understanding, assessment, and management of depression.

Given that dissociative individuals may be at higher risks for suicidal ideation and self-mutilation (Şar et al., 2013) and given that multiple suicide attempts are associated with dissociation (Foote et al., 2008), the need to assess for comorbid dissociation in depressed individuals who are suicidal may be particularly strong. This would also apply to

Table 2
Mean differences in childhood betrayal and non-betrayal trauma.

		Unadjusted		One-way ANOVA	Adjusted		One-way ANCOVA	
	N	Mean	SD	F	Mean	SE	F	Post-hoc (Bonferroni)
Childhood betrayal trauma				98.144***			91.820***	D > A, D > B, D > C, C > A, B > A
None (A)	1146	0.72	1.08		0.72	0.04		
Depression only (PHQ ≥10) (B)	957	1.19	1.29		1.18	0.04		
Dissociation only (SR-DDIS-DF ≥ 3) (C)	121	1.13	1.24		1.16	0.11		
Depression + Dissociation (D)	513	1.85	1.49		1.85	0.06		
Childhood non-betrayal trauma				85.807***			83.919***	D > A, D > B, D > C, C > A, B > A
None (A)	1146	0.56	0.82		0.55	0.03		
Depression only (PHQ ≥10) (B)	957	0.71	0.91		0.71	0.03		
Dissociation only (SR-DDIS-DF ≥ 3) (C)	121	0.80	0.96		0.81	0.09		
Depression + Dissociation (D)	513	1.36	1.27		1.38	0.04		

Notes.
***p < .001.
Age and gender (female) were included as covariates.
PHQ-9 = the Patient Health Questionnaire-9; SR-DDIS-DF = the Dissociative Features Section of the Self-Report Dissociative Disorders Interview Schedule.

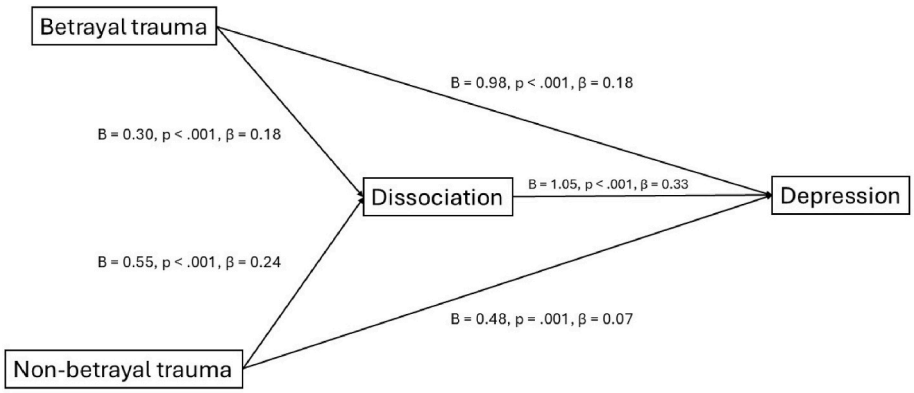


Fig. 1. The path model of the association between trauma, dissociation and depression (N = 2737).
Note: In this model, age and gender were added as covariates but their paths were not shown in this Figure.

depressed individuals with other self-destructive behaviors, and potentially to individuals with treatment-resistant depression. Moreover, as most (67.0%–90.2%) dissociative individuals would suffer from depressive symptoms at the same time, timely clinical management is necessary to prevent suicidal risks. Additionally, the results suggest that dissociation should be given more public health attention as it is closely related to depression, which indicates major mental health impairments.

Since dissociative symptoms are relatively common among individuals with depression, as shown in the present study as well as in a previous study (Fung et al., 2022a), individuals reporting depression or seeking treatments for a depressive disorder should be screened for dissociation. As this co-occurrence is characterized by childhood trauma, individuals with this comorbidity might not respond well to standard depression treatments that do not take childhood trauma into account. As Şar (2011, 2015) has proposed, dissociative depression may be the cause of treatment-resistant depression in some cases. Therefore, patients with treatment-resistant depression should be assessed for dissociation. Once dissociation is identified, trauma and dissociation-informed interventions should be considered (Brand and Loewenstein, 2014; Fung et al., 2022c; Myrick et al., 2017).

The present study did not yield a significant difference regarding betrayal versus non-betrayal trauma in childhood as a predictor of dissociative depression. Dissociative symptoms partly mediated the relationship between childhood trauma and depressive symptoms, regardless of the type of trauma. A previous study documented a relationship between dissociative depression and both emotional neglect and being exposed to overprotection-overcontrol in childhood (Şar and Türk-Kurtça, 2021). These apparently opposed childrearing styles could be subtle forms of betrayal (Şar et al., 2021). Thus, subtle developmental traumatization may occur relatively early in life (Şar, 2020) and may be critical in emergence of dissociative depression which, itself, tends to become manifest at a younger age than does non-dissociative depression (Şar et al., 2013). Future studies should broaden the concept and definition of betrayal trauma and further investigate the specific relationship between dissociative depression and other subtle forms of developmental trauma, including dysfunctional communication styles in families, dysfunctional attachment, or inter-generational transmission of traumatic stress (Şar, 2023). Further evaluation of the betrayal trauma theory is also necessary.

This study has several strengths: We used well-validated measures to investigate depressive and dissociative symptoms. We analyzed data from diverse samples. We also minimized the potential effects of cultural and language differences as all participants were Chinese speakers. However, there are also some major limitations. First, our samples were not representative of the general populations (e.g., most participants were female) – we only analyzed all available data from our research team. Also, the samples were not matched in any way, so direct comparisons among the samples are not possible and meaningful. Second, childhood trauma was retrospectively reported in this study, although previous studies showed that self-report data of childhood trauma are generally reliable (Goldberg and Freyd, 2006). In addition, 73.7% of participants had been exposed to childhood trauma in our combined sample, and the possibility that those exposed to trauma were not actually traumatized should be considered. Third, our cross-sectional design did not allow us to reveal whether dissociative symptoms occurred before the depressive symptoms. Following on our recent study (Fung and Cheung, 2024), we further explored the mediating effects of dissociative symptoms in the present study. However, given the cross-sectional nature of the data, further studies using longitudinal data are needed. Finally, our analyses were based on self-report data collected using screening tools rather than diagnostic interviews – we only reported the rates of co-occurrence of probable depressive and dissociative symptoms. While further studies are needed, it is important to note that self-report measures are commonly found to be valid and are widely used in psychiatric and epidemiological research (Hyland and Shevlin, 2024). Recent studies have also found that self-report measures of dissociation are reliable and valid (Fung et al., 2018), and would not lead to over-reporting of the symptoms (Ross and Browning, 2017). Future studies, however, should further investigate the comorbidity between different specific depressive disorders and dissociative disorders. The techniques and strategies recommended to validate subtypes in psychiatry (Agelink van Rentergem et al., 2021) should be employed in future studies to examine the validity of the dissociative subtype of depression too. For example, it is important to investigate whether this subtype is stable over time and whether it is associated with unique treatment needs and outcomes.

5. Concluding remarks

This study provides systematic data from diverse samples showing that a considerable subgroup of depressed individuals exhibits co-occurring dissociative symptoms, and that the co-occurrence of depressive and dissociative symptoms is characterized by higher levels of childhood trauma. The findings suggest that further studies on the possible dissociative subtype of depression are needed. Future studies on the comorbidity between depressive and dissociative disorders are required, using different methodologies (e.g., longitudinal data and latent class analysis) and more representative samples across cultures. Screening for dissociation is recommended for individuals who report depression, particularly those who do not respond well to standard depression treatments. Trauma-informed care should be provided for those who present with both depression and dissociation.

CRediT authorship contribution statement

Hong Wang Fung: Writing – original draft, Resources,

Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Grace Wing Ka Ho:** Writing – review & editing, Supervision. **Stanley Kam Ki Lam:** Writing – review & editing, Resources, Investigation. **Anson Kai Chun Chau:** Formal analysis, Writing – review & editing. **Vedat Şar:** Writing – review & editing, Supervision. **Colin A. Ross:** Writing – review & editing, Supervision. **Kunhua Lee:** Writing – review & editing, Resources. **Wai Tong Chien:** Writing – review & editing, Supervision. **Janet Yuen-Ha Wong:** Writing – review & editing, Supervision, Resources.

Consent to participate

Online written informed consent was obtained from all participants before study participation.

Ethics approval

The paper analyzed data from five survey projects, which obtained ethical approval from the institutional review board at the Hong Kong Baptist University, the Chinese University of Hong Kong, and National Tsing Hua University, Taiwan. All participants provided online written informed consent before they completed the survey.

Availability of data and material

The dataset generated and analyzed during the current study is available from the corresponding author (HWF) on reasonable request.

Code availability

Not applicable.

Consent for publication

Not applicable.

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Declaration of competing interest

None.

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