A Longitudinal Study of Adjustment Disorder After Trauma Exposure

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Objective: Adjustment disorder has been recategorized as a trauma- and stressor-related disorder in DSM-5. The aim of this study was to determine the prevalence of adjustment disorder in the first 12 months after severe injury; to determine whether adjustment disorder was a less severe disorder compared with other disorders in terms of disability and quality of life; to investigate the trajectory of adjustment disorder; and to examine whether the subtypes described in DSM-5 are distinguishable.

Method: In a multisite, cohort study, injury patients were assessed during hospitalization and at 3 and 12 months postinjury (N=826). Structured clinical interviews were used to assess affective, anxiety, and substance use disorders, and self-report measures of disability, anxiety, depression, and quality of life were administered.

Results: The prevalence of adjustment disorder was 19% at 3 months and 16% at 12 months. Participants with adjustment disorder reported worse outcomes relative to those with no psychiatric diagnosis but better outcomes compared with those diagnosed with other psychiatric disorders. Participants with adjustment disorder at 3 months postinjury were significantly more likely to meet criteria for a psychiatric disorder at 12 months (odds ratio=2.67, 95% CI=1.59–4.49). Latent-profile analysis identified a three-class model that was based on symptom severity, not the subtypes identified by DSM-5.

Conclusions: Recategorization of adjustment disorder into the trauma- and stressor-related disorders is supported by this study. However, further description of the phenomenology of the disorder is required.

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The publication of DSM-5 (1) saw the recategorization of adjustment disorder as a trauma- and stressor-related disorder in recognition that a stressful event is a necessary (although not sufficient) condition for the development of the disorder. Despite the reconceptualization, the DSM-5 diagnostic criteria did not change from DSM-IV, as it was argued that so little research had been undertaken on adjustment disorder that any such changes would be based on too limited evidence (2). Adjustment disorder represents one of the most poorly researched psychiatric diagnoses, with little empirical understanding of its phenomenology, relationship to other disorders, or course (2–5). This is a worrying situation given the frequency with which it is used in clinical practice (2).

The DSM-5 diagnostic criteria for adjustment disorder are presented in Table 1. There is no doubt that the vagueness of the diagnostic criteria contributes to the lack of research interest in this disorder because it is remarkably difficult to operationalize. This has been discussed in a number of eloquent commentaries (2, 4) and highlighted in the limitations section of the present article. Key to the future of the disorder is research that can help inform the diagnostic criteria.

PREVALENCE OF ADJUSTMENT DISORDER

Adjustment disorder has not been included in national mental health surveys, and thus population prevalence rates are unknown. The exception to this was the European Outcomes of Depression International Network study, which reported a prevalence rate of 0.5% using DSM-IV criteria but which restricted adjustment disorder to the depressed mood subtype only (6, 7). Prevalence studies in populations exposed to specific stressors are generally of poor methodological design, such as small sample size (8), medical chart review (9), or verbal autopsy review (10). However, more recent studies have utilized stronger methodological designs. For example, a meta-analysis of cancer patients based on 27 articles reported a pooled adjustment disorder prevalence rate of 19% (11). Similar rates have been reported within consultant-liaison psychiatry inpatients (12), but lower rates have also been reported in other settings such as primary care (13). To our knowledge, no study to date has reported the prevalence of adjustment disorder following a traumatic stressor (defined as meeting DSM-5 definition of traumatic stressor (1, p. 274).

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TABLE 1. DSM-5 Diagnostic Criteria and Operationalization of Adjustment Disorder

Criteria	DSM-5 Criteria	Operationalization	Assessment Point
A	Onset of emotional or behavioral symptoms must occur after an identifiable stressor and occur within 3 months of the stressor.	Stressor: All participants experienced an injury severe enough to require at least 24 hours hospitalization in major trauma service.	At hospitalization
		Clinician-Administered PTSD Scale for DSM-IV (CAPS) was used to measure the presence of re-experiencing, avoidance, and hyperarousal symptoms.	3 and 12 months
		Mini-International Neuropsychiatric Interview screening questions were used to measure the presence of mood and anxiety symptoms. At least one symptom on either CAPS or the Mini-International Neuropsychiatric Interview screen was required for a diagnosis.	
B	Symptoms need to be clinically distressing, taking into account contextual and cultural factors	The World Health Organization Quality of Life-BREF Psychological scale: A score of <55.5 represents clinical distress and was required for a diagnosis if social or occupational functioning criteria were not met.	3 months 12 months
	or impairing in either social or occupational domains of functioning.	Functional impairment was assessed using the CAPS criterion F questions. A score <1 on either social or occupational functioning questions was required for a diagnosis (if clinical distress criteria were not met). This is a robust measure of functional impairment having a significant relationship with the World Health Organization Disability Assessment Scale II.[a]	3 months 12 months
C	Cannot be diagnosed if another axis 1 disorder is present.	Mini-International Neuropsychiatric Interview version 5.5: Anxiety, depressive, and substance use disorders. No diagnosis of these disorders was required for a diagnosis of adjustment disorder.	3 months 12 months
	Cannot be an exacerbation of a preexisting disorder.	Premorbid World Health Organization Quality of Life-BREF Psychological scale: A score <55.5 threshold represented preexisting psychological distress. A score >55.6 was required for a diagnosis.	Assessed during hospitalization with 4 weeks prior to injury as reference point
D	The symptoms should not represent normal bereavement.	Given the difficulty measuring "normal bereavement," which would involve assessing cultural and contextual norms, we excluded participants whose injury event involved a fatality (N=10).	
E	Once the stressor or its consequences have resolved, the symptoms do not persist for more than 6 months.	Although all participants experienced a similar stressor as an entry criterion of the study, the subjective nature of defining a stressor or consequence (and therefore whether or not the stressor had resolved) in the following year was difficult, and thus these criteria were not assessed.	Not assessed

[a] Chi-square test results of the analysis for this operationalization are as follows: χ^2=68.53, df=1, p<0.001.

IS ADJUSTMENT DISORDER A CONDITION OF LESS SEVERITY?

DSM-5 upheld the condition that adjustment disorder can only be diagnosed in the absence of another disorder, which is more restrictive than similar criteria for other disorders (e.g., panic disorder: "The disturbance is not better explained by the symptoms of another mental disorder …." [1 p. 197]). As such, it has been described as a subclinical or mild disorder compared with other psychiatric disorders (4). The limited research that has explored this issue is equivocal. Fernandez et al. (13) found that adjustment disorder sat between major depression and no disorder in terms of severity, while a study by Manoranjitham et al. (10) found it to be a more serious condition, particularly in respect to suicide. The limitations of the designs of these studies (retrospective, medical record review, cross-sectional) may contribute to this discrepancy, and thus further studies with stronger designs are required.

ADJUSTMENT DISORDER TRAJECTORY

The question about whether adjustment disorder pathologizes a normal stress reaction has been raised (3). DSM-5 upheld the diagnostic algorithm that required clinically distressing symptoms or functional impairment. This requires diagnostic decisions to be made regarding whether symptoms are clinically significant and not simply part of a normal range of distress reactions. Central to this argument is the trajectory of adjustment disorder over time. If adjustment disorder was part of a normal stress reaction, then the expectation would be that the symptoms would dissipate over

time. The lack of longitudinal studies investigating adjustment disorder has left this question unanswered.

DISCRIMINATION OF SUBTYPES

DSM-5 retained the subtype approach to adjustment disorder. Depending on the symptom profile, individuals can be given an anxiety or mood or disturbance of conduct subtype, or a mixed anxiety/depression subtype, or a mixed disturbance in emotions and conduct. The degree to which these subtypes are discriminatory has received little research attention.

The aim of the present study was to advance inquiry into the DSM-5 diagnosis of adjustment disorder by examining 1) the prevalence of adjustment disorder following exposure to a traumatic stressor (serious injury); 2) whether adjustment disorder manifests itself as a condition of lesser severity compared with other anxiety and affective disorders; 3) the trajectory of adjustment disorder over time; and 4) whether the subtypes offer useful discrimination, and if not, what symptoms are important to the diagnosis.

METHOD

Participants

The data utilized in this study were from a large cohort study of injury survivors, the Australian Injury Vulnerability Study. Detailed methods and information on the study are described elsewhere (14). Individuals with injury admissions to four level 1 trauma centers in Australia were recruited from April 2004 to February 2006. Participants were included in the study if they were between 16 and 70 years old, proficient in English, and required hospitalization for greater than 24 hours. Patients were excluded from the study if they were actively suicidal or psychotic or had a moderate to severe traumatic brain injury. Patients were selected using an automated random selection procedure that was stratified by length of stay to ensure that the likelihood of being selected for participation in the study was not biased by long-stay patients. The study was approved by relevant ethics committees, and written informed consent was obtained for all participants.

Baseline data were collected prior to discharge from the hospital, which was on average 7.20 days (SD=9.07) after injury, and follow-up data were collected at 3 months and 12 months after injury. A total of 1,049 participants completed the baseline assessment, 944 completed the 3-month follow-up, and 826 completed the 12-month follow-up. Individuals who elected not to participate in the study did not differ from those who participated with regard to age, gender, length of hospital admission, or injury severity. Those lost to follow-up at 3 months or 12 months did not differ on demographic variables except age, with those lost to follow-up being younger at admission (3 months: 35.86 years old [SD=13.21] compared with 38.75 years old [SD=13.71], $t=2.27$, $df=1033$, $p<0.05$; 12 months: 35.59 years old [SD=12.77] compared with 39.26 years old [SD=13.24], $t=3.71$, $df=1033$, $p<0.001$).

Measures

Three- and 12-month adjustment disorder. There is no recognized gold standard DSM-5 adjustment disorder diagnostic instrument (2). Therefore, we assessed adjustment disorder using a number of different measures that included the Clinician-Administered PTSD Scale (CAPS [15]), the Mini-International Neuropsychiatric Interview 5.5 (16), and the World Health Organization Quality of Life-BREF (17). The operationalization of adjustment disorder is presented in Table 1.

The CAPS is a structured clinical interview widely used for diagnosing posttraumatic stress disorder (PTSD). Interviews were digitally recorded, and 5% of all CAPS interviews were assessed by a blind, independent assessor to test interrater reliability. Overall, the diagnostic consistency on a PTSD diagnosis at 3 months was 0.98, and at 12 months it was 1.0.

The Mini-International Neuropsychiatric Interview 5.5 is based on the DSM-IV/ICD-10 classifications of mental illness (16). Modules administered included major depressive episode, PTSD (prior to injury), generalized anxiety disorder, social phobia, panic disorder, agoraphobia, obsessive-compulsive disorder, and a substance use disorder. Diagnostic consistency, using previously described methodology, for all diagnoses at 3 months was 0.99, and it was 1.0 at 12 months.

The World Health Organization Quality of Life-BREF psychological domain is an 8-item scale that assesses aspects of distress, such as feelings of despair, low mood, anxiety and depression, failure to enjoy life, and absence of meaning in life. Australian population threshold score was used to identify high distress (18).

Disability. The impact of adjustment disorder (diagnosis and individual symptoms) on disability was assessed using the 12-item World Health Organization Disability Assessment Schedule II (19), which was administered at 3 and 12 months postinjury. Higher scores are associated with higher disability (20).

Quality of life. The impact of adjustment disorder on quality of life was assessed using three domains from the World Health Organization Quality of Life-BREF (social, environmental, and physical). It is noteworthy that the fourth domain (psychological) was used to construct the diagnosis and thus not included in the analyses that examined the disorder's impact on quality of life. High scores indicated higher quality of life (21).

Anxiety and depression. The presence and severity of anxiety and depressive symptoms was assessed using the Hospital Anxiety and Depression Scale (22). This self-report questionnaire is suitable for use in injury populations, since it does not measure the somatic symptoms of affective or anxiety disturbance.

Data Analysis

The 3- and 12-month prevalence of adjustment disorder was assessed using frequency data. While recognizing that assessing adjustment disorder at 12 months postinjury

TABLE 2. Demographic Characteristics, Injury Information, and Adjustment Disorder Symptom Frequency Among Participants at 3 Months (N=929)

Characteristic and Symptom	Analysis	
	Mean	SD
Age (years)	37.87	13.66
	N	%
Gender (male)	681	73.4
Employment status (employed)	824	88.7
Relationships status at the time of injury		
Married/living together	453	48.8
Single	475	51.2
Mechanism of injury		
Motor vehicle accident	611	65.8
Fall	145	15.7
Assault	58.5	6.3
Work	45	4.9
Other	67	7.3
	Mean	SD
Injury characteristics		
Injury severity score	11.33	8.25
Length of hospital stay	12.89	13.53
	N	%
Intensive care unit admission	143	15.5
Lifetime psychiatric history (yes)	576	62.1
Major depressive episode	244	26.3
Anxiety disorder	150	16.2
Posttraumatic stress disorder	127	13.7
Alcohol use disorder	314	33.9
Adjustment disorder symptom frequency at 3 months[a]		
Sleep disturbance	399	43.0
Anger or irritability	260	28.0
Concentration difficulties	222	24.0
Hypervigilance	176	19.0
Distress upon reminders of injury event	167	18.0
Excessive worry	148	16.0
Distressing memories of injury event	139	15.0
Anxiety in social settings	130	14.0
Anhedonia	111	12.0
Distressing dreams or nightmares	111	12.0
Increased startle	102	11.0
Feeling detached or estranged from others	92	10.0

[a] The top 12 most frequently endorsed symptoms are reported.

contravenes the DSM-5 adjustment disorder time criteria (criterion E), we wanted to assess the relevance of the diagnosis over the long-term (and thus for the 12-month prevalence rates, the time criterion was excluded).

To assess the severity of adjustment disorder compared with other disorders, we ran a three-group multivariate analysis of variance (MANOVA) comparing those with an adjustment disorder, those with another psychiatric disorder, and those without any disorder on measures of quality of life, disability, and anxiety and depressive symptoms. These analyses were run using the 3-month data. Assumptions required for MANOVA are presented in the data supplement accompanying the online version of this article.

To examine adjustment disorder trajectory over time, we conducted three binomial logistic regressions. The first was to identify whether adjustment disorder at 3 months (compared with no disorder) increased risk for another psychiatric disorder at 12 months. The second was to identify whether adjustment disorder at 3 months (compared with no disorder) increased risk for adjustment disorder at 12 months. The third was to identify whether adjustment disorder at 3 months (compared with no disorder) increased risk for suicidality at 12 months. All logistic regressions controlled for age, gender, marital status, and injury severity score.

A latent-profile analysis was conducted to assess whether there were distinct subtypes within the diagnosis. A latent-profile analysis is a person-centered analysis that is used to find clusters of individuals with similar patterns of responses to indicator measures (23). For these analyses, we used the Hospital Anxiety and Depression Scale scores. All analyses were completed in Mplus version 7.11 (24). The decision on the preferred number of classes was based on model-fit criteria, interpretability, and parsimony (see the online data supplement for information on fit criteria). If our data were consistent with the subtypes identified in DSM-5, we would expect to see a high anxiety/low depression class, a high depression/low anxiety class, and a high depression/high anxiety class.

Following this, we examined which symptoms were particularly important to the diagnosis of adjustment disorder and which were particularly disabling. Binomial logistic regression was used to identify which 3-month symptoms predicted a 3-month diagnosis of adjustment disorder and which predicted 3-month disability (World Health Organization Disability Assessment Schedule 2.0). A Holm-Bonferonni sequential correction was applied to correct for family-wise error rates (25).

RESULTS

Demographic characteristics and injury information regarding participants in the study sample are presented in Table 2. Participants scored in the moderate injury severity range (26), and all participants met DSM-5 criteria for a traumatic event. The main mechanism of injury was motor vehicle accident or fall, which is a common profile in Australian injury samples. Nearly two-thirds of the sample met criteria for a lifetime history of psychiatric disorder, which is also common in injury populations (27).

Prevalence of Adjustment Disorder

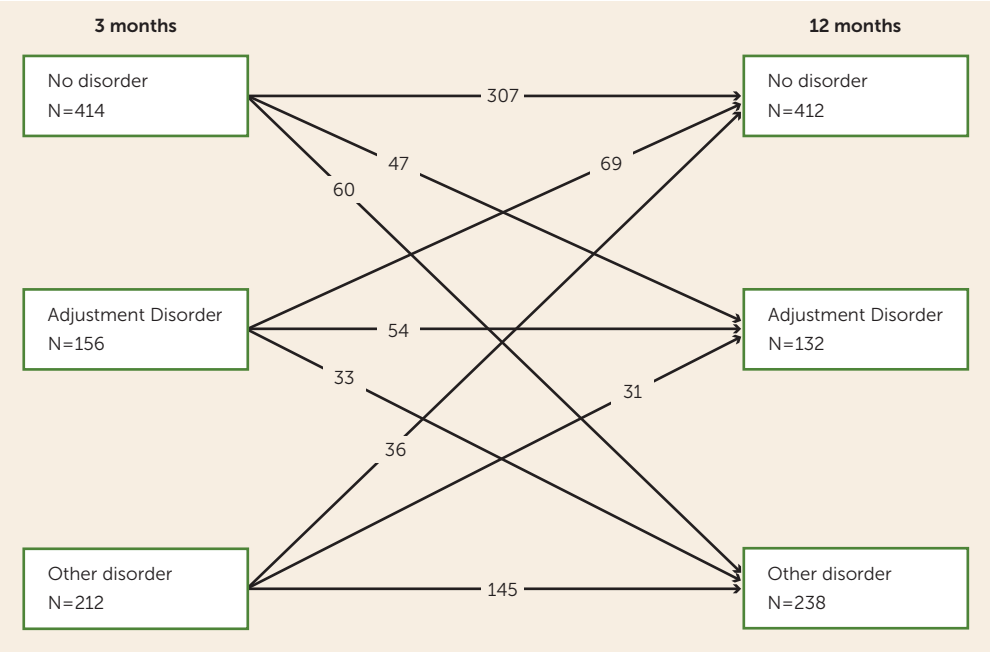
The prevalence rate for an adjustment disorder was 18.9% (N=178) at 3 months and 16.3% (N=135) at 12 months. The trajectory of adjustment disorder over time is shown in Figure 1.

Is Adjustment Disorder a Disorder of Lesser Severity?

The MANOVA using quality of life, disability, anxiety symptoms, and depressive symptoms as independent variables

revealed that there was a statistically significant difference between no psychiatric disorder, adjustment disorder only, and other psychiatric disorder, ($F=33.681$, $df=12, 1682$, $p<0.0005$; Pillai's trace=0.387; partial $\eta^2=0.194$). MANOVA findings and post hoc comparisons across all measures are summarized in Table 3. Consistently across all six measures, those with adjustment disorder reported worse outcomes than those with no diagnosis. However, those who met diagnostic criteria for another psychiatric disorder reported worse outcomes than those in the adjustment disorder group.

FIGURE 1. Trajectory of Psychiatric Diagnosis Over Time (3 and 12 Months) in an Injury Sample[a]



[a] A total of 782 participants completed measures at both time points.

Adjustment Disorder Trajectory

Logistic regression revealed that adjustment disorder at 3 months (compared with no psychiatric disorder) significantly increased risk for 12-month psychiatric disorder (not including 12-month adjustment disorder) (odds ratio=2.67, 95% confidence interval [CI]=1.59−4.49, $p<0.001$). Adjustment disorder at 3 months (compared with no psychiatric disorder) also significantly increased the risk of being diagnosed with an adjustment disorder at 12 months (odds ratio=5.45, 95% CI=3.35−8.87, $p<0.001$). Adjustment disorder at 3 months was not associated with increased risk of suicidality at 12 months (odds ratio=1.30, 95% CI=0.48−3.55, $p=0.61$).

Subtypes

Overall, the data supported the selection of a three-class model at 3 months (Table 4). The four-class model generated comparable fit indices, although the bootstrap likelihood ratio test indicated a preference for the three-class model. The remaining fit indices were similar between the four-class and three-class models, and thus preference was given to the three-class model under rules of parsimony. The three classes were based on symptom severity, with low, medium, and high symptom severity (see Figure S1 in the online data supplement). There was no suggestion that the classes were differentiated by anxiety or depression symptoms (see the data supplement).

We examined the most frequently endorsed symptoms in each class, but since they were very similar across class, we examined the frequency of symptom endorsement for the adjustment disorder diagnosis at 3 months (for the top 12 symptoms, see Table 2). Interestingly, of those with adjustment disorder at 3 months, 28.7% (N=51) reported at least one re-experiencing symptom. Logistic regression showed that the symptoms at 3 months that predicted adjustment disorder at 3 months were intrusive memories (odds ratio=6.33, 95% CI=2.08–19.27) and concentration difficulties (odds ratio=4.21, 95% CI=2.23–7.95). Symptoms that predicted 3-month high disability were sleep disturbance (odds ratio=2.03, 95% CI=1.41–2.91) and irritability/anger (odds ratio=2.35, 95% CI=1.49–3.71).

DISCUSSION

Since its introduction into DSM nomenclature, adjustment disorder has been a relatively understudied and controversial disorder. This large, multisite cohort study of adjustment disorder goes some ways toward addressing important questions about the disorder.

The prevalence rate of adjustment disorder made it one of the most frequently diagnosed psychiatric disorders in this sample (see Bryant et al. [14] for other prevalence rates from this sample). Our study extends most other adjustment disorder research by allowing a 3-month period between the injury event and assessment, which allowed for acute but transient distress symptoms to dissipate. Adjustment disorder was a chronic condition for approximately one-third of those with the disorder at 3 months. This is an important finding given the chronic specifier was present in DSM-IV but removed in DSM-5, and it suggests that future reviews of diagnostic criteria should take into consideration that adjustment disorder is not a transient disorder for some people. Future studies are needed to investigate chronic adjustment disorder in more detail.

TABLE 3. Comparison of Mean Scores on Quality of Life Domains (Physical, Social, and Environmental), Disability, Anxiety and Depression Across Psychiatric Disorder Status (None, Adjustment Disorder, Other Psychiatric Disorder) at 3 Months

	Group						Multivariate Analysis of Variance[a]			Comparison		
	No Psychiatric Disorder (N)		Adjustment Disorder (AD)		Other Psychiatric Disorder (O)					N Compared With AD[b]	N Compared With O[b]	AD Compared With O[b]
Measure	Mean	SD	Mean	SD	Mean	SD	F	Partial η^2	p	p	p	p
World Health Organization Quality of Life-BREF (physical)	67.38	18.13	51.36	19.94	45.37	20.29	115.73	0.215	<0.001	<0.001	<0.001	0.010
World Health Organization Quality of Life-BREF (social)	72.94	19.29	63.04	21.22	52.99	22.93	73.40	0.148	<0.001	<0.001	<0.001	<0.001
World Health Organization Quality of Life-BREF (environment)	74.17	14.15	63.63	14.40	56.51	16.21	116.62	0.216	<0.001	<0.001	<0.001	<0.001
World Health Organization Disability Assessment Schedule II (disability)	7.92	6.65	13.14	7.17	15.16	7.70	91.41	0.178	<0.001	<0.001	<0.001	0.016
Hospital Anxiety and Depression Scale (anxiety)	3.69	3.27	6.06	3.33	9.56	4.67	193.55	0.314	<0.001	<0.001	<0.001	<0.001
Hospital Anxiety and Depression Scale (depression)	2.88	2.70	5.70	3.59	7.87	4.51	166.90	0.283	<0.001	<0.0005	<0.0005	<0.0005

[a] The df value for all multivariate analyses of variance was 2, 848.
[b] Games-Howell was used for all post hoc comparisons, as the data violated the assumption of homogeneity of variances.

TABLE 4. Goodness-of-Fit for Unconditional Latent-Profile Analysis Models

Model Tested	Log Likelihood	Akaike Information Criterion	Bayesian Information Criterion	Adjusted Bayesian Information Criterion	Entropy	Lo-Mendell-Rubin Likelihood Ratio Test	Bootstrap Likelihood Ratio Test of Model Fit
Baseline							
One-class	−865.938	1739.875	1752.250	1739.587			
Two-class	−848.096	1710.193	1731.849	1709.688	0.651	0.379	<0.0001
Three-class	−841.804	1703.608	1734.546	1702.887	0.751	0.059	<0.0001
Four-class	−839.294	1704.588	1744.807	1703.651	0.781	0.622	0.4286
Five-class	−831.348	1694.695	1744.195	1693.542	0.790	0.028	0.0128

Our study also highlights that adjustment disorder is not a stable condition, with the majority of patients with the disorder at 12 months not having the diagnosis at 3 months, and two-thirds of those who had the disorder at 3 months no longer had the diagnosis at 12 months. This fluctuating diagnostic status is consistent with studies that report the changing course of other psychiatric disorders over time (28). The development of adjustment disorder after the 3-month time points may be associated with the consequences of the injury that develop in the ensuing months, such as legal issues or occupational impairment. This finding challenges the current adjustment disorder criterion A, which requires the disorder to commence within 3 months of the stressor and suggests that future revisions consider the possibility that patients may develop difficulties adjusting to the consequences of an event at a later point in time.

In addition to providing support for elevating adjustment disorder to the trauma- and stressor-related disorders chapter in DSM-5, our findings provide some support for the ICD-11 proposed criteria for adjustment disorder, which view adjustment disorder as sitting on the PTSD continuum (29). In our study, intrusive memory was the symptom that was most likely to be associated with a diagnosis of adjustment disorder, and a number of PTSD criterion E symptoms were significantly associated with either adjustment disorder or high levels of disability (e.g., poor concentration, disturbed sleep, and irritability/anger). This is consistent with the view that adjustment disorder is (in part) a subthreshold PTSD-like disorder (30). However, all these symptoms are also associated with many other psychiatric disorders—concentration difficulties (1), poor sleep (31), intrusive memories (32, 33), and anger (34)—and as such it is important to consider adjustment disorder in its wider context.

Our initial investigations would suggest that the DSM-5 adjustment disorder sits on a continuum between no disorder and other psychiatric disorders. In our study, compared with

other psychiatric disorders, adjustment disorder was associated with significantly lower levels of disability/anxiety/depression symptoms and higher levels of quality of life. This finding appears to be in contrast to other studies that suggest that adjustment disorder and other psychiatric disorders are indistinguishable in terms of symptom severity (7), but it is consistent with results reported in a recent study (13). However, our data also point to adjustment disorder as a gateway disorder to other, more severe disorders. This suggests that the disorder could be an excellent target for brief interventions to alter the trajectory into severe disorder.

The latent-profile analysis showed that in general a mixed anxiety and depression profile was most common. We did not find classes distinguished by high anxiety/low depression or high depression/low anxiety that we would expect to see if the DSM-5 subtypes existed. This leads us to suggest that subtyping in adjustment disorder is unnecessary. While recognizing that subtypes are often used to guide the focus of treatment, our findings suggest that targeting PTSD, anxiety, and depression symptoms would be more appropriate than limiting intervention to a narrow subtype.

Our findings may have implications for the assessment and diagnosis of adjustment disorder under DSM. We would argue that a clear list of symptoms should be provided to help address the diagnostic vagueness of DSM-5. Given that the current intent of the DSM-5 diagnosis of adjustment disorder is to identify people who have limited but disabling symptoms, our findings suggest that important symptoms to include in this list are intrusive memories, sleep disturbance, anger/irritability, and concentration difficulties. However, further research is required to further refine the diagnostic criteria for the disorder.

Despite the strong methodological design of our study compared with most adjustment disorder studies, some limitations should be noted. Because of the lack of instruments designed to assess the DSM-5 criteria for adjustment disorder, we compiled a measure from existing measures, and the resulting diagnosis has no reliability or validity information. There are many aspects of the DSM-5 adjustment disorder diagnosis that make operationalization difficult, and these limitations have been frequently discussed (2, 4). Of particular relevance to our study was the issue surrounding what defines a "stressor," as well as the "consequences of the stressor." In this study, we defined the stressor as the injury event. We did not assess the consequences of the stressor directly, which may have implications for our comments about chronic adjustment disorder and means that we cannot comment on whether it was the initial injury or the consequences of the injury (such as pain) that was the trigger stressor. Second, it was difficult to operationalize "normal bereavement" given cultural and contextual norms, and as such we excluded a small group of individuals who were bereaved (N=10). This may affect the generalizability of our findings. Similarly, because DSM-5 does not define "a disturbance in conduct," our ability to capture this aspect of the diagnosis was limited. Finally, it should be recognized that the stressor event in our study was a relatively homogenous, traumatic event (i.e., severe injury), and the degree to which our findings generalize to nontraumatic events or other traumatic events is unknown. Future studies should also consider that an individual's response to a stressor may vary across cultures, and this should be considered as part of the stressor-response evaluation.

Adjustment disorder now sits alongside PTSD in the trauma- and stressor-related disorders chapter in DSM-5. Many of our findings provide support for the inclusion of adjustment disorder in this chapter. This study adds to the limited research evidence on adjustment disorder by demonstrating that the diagnosis identifies people who following a stressor experience distress/functioning impairment and who are at risk for developing more severe disorders. However, it challenges the current diagnosis by finding that 1) many people develop the disorder beyond the initial 3 months after the stressor and 2) it does not present with distinct anxiety or depressive symptoms but rather mixed features, with PTSD symptoms playing an important role. Considering the frequency with which this diagnosis is used by clinicians, it is imperative that more structured research is conducted so that robust diagnostic criteria can be established.

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