Case Study: The effects of TRE on depression, anxiety, and stress in First Responders

Authors

Ms Heather Hruby MS LIMHP LADC

Embodied Mind Counseling LLC, Omaha, Nebraska, USA

TRE Provider

Dr Jill Beattie

Medicine, Nursing & Health Sciences, Monash University, Frankston, Victoria, Australia

TRE Provider

Corresponding Author

Ms Heather Hruby MS LIMHP LADC

Embodied Mind Counseling LLC - https://www.embodiedmindcounseling.com/

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Introduction

First responders are men and women who are first at the scene and provide an initial response to a variety of emergency situations such as a fire, accident, or natural disaster. First responders include police, firefighters, ambulance paramedics, rescue, and other emergency services personnel. Their response occurs in unpredictable, often dangerous situations and "the risk of stress and posttraumatic stress (PTSD) is inherent in the work they do" (Barratt et. al. 2018). As highlighted by Heath and Beattie (2019) and Barratt, Stephens and Palmer (2018), current evidence-based interventions result in the full recovery from PTSD for only one-third of people, and 30-40% gain no or little benefit. Therefore, innovative treatment methods are required, and Tension and Trauma Releasing Exercises (TRE) is one such method.

Research to date has shown that TRE and the activation of the body's natural tremor mechanism is a safe way to reduce stress, anxiety, and deep body tension and has been useful in the post-trauma recovery process (Heath and Beattie 2019).

Aim and Study Design

This small study was conducted by TRE Provider Heather Hruby as part of evaluating the impact of her TRE Training with firefighters. Therefore, this was a small evaluation study with a convenience sample using a pre-/post-intervention design.

The primary aim was to introduce the Tension and Trauma Releasing Exercise (TRE) process to firefighters to provide them with a mechanism they could use themselves for managing stress. Thus, determining if TRE was an acceptable and feasible method for reducing stress.

The secondary aim was to measure the effect of TRE training on depression, anxiety, and stress.

Ensuring anonymity and Informed consent

Participants created their own identification number (ID) by stating the initials of their Mother's name and adding their own birth date (for example – Tina Jones born 5th April 1963 – Identification Number = TJ05041963); they entered this in the designated box, either on the hard copy or online questionnaire. Thus, anonymity was assured. TRE was explained to the participants and there was an opportunity to ask further questions. Consent to learning TRE, completing the questionnaires, and using anonymous information when reporting and publishing results was also obtained.

Methods

Recruitment, site, and participants

The Manager of firefighter training was contacted regarding introducing TRE to a group of about 8 people willing to learn TRE for relief of stress related to their jobs as first responders. In addition, the training manager agreed that that a pre- and post-test evaluation study would be welcomed. A group of peer support team members and firefighters were invited to learn TRE and participate in the study. The training was conducted at a fire station in Iowa.

Measures and data collection

Demographic data such as age group, gender, any current illness, and whether participants had done TRE before were collected.

The Depression, Anxiety and Stress Scale 21 (DASS21) was used to measure the effect of TRE training (Lovibond and Lovibond, 1995). The DASS21 is a valid and reliable 21-item self-report questionnaire designed to measure the negative emotional states of depression, anxiety, and stress (Henry and Crawford, 2005). It is not a diagnostic tool but measures the degree to which someone has experienced symptoms of depression, anxiety, and stress over the previous week. The questionnaire uses a 4-point Likert scale, where 0=did not apply to me at all, through to 4=Applied to me very much, or most of the time (Refer to the Appendix for detail). Overall score range 0-63 (lower scores indicate less risk of depression, anxiety, and stress symptoms).

Firefighters completed the questionnaire at two time points, prior to commencing TRE training (T1) and were encouraged to complete it again 4-weeks (T2) after TRE training. Three reminders were sent via email to complete the 4-week questionnaire; the second was sent just prior to the Christmas period and the third reminder was sent after the Christmas and new year period. The questionnaire was completed in hard copy or online format at the preference of the participant.

Data analysis

Demographic data are reported using descriptive statistics. Due to the small sample size completing both questionnaires (n=2) only descriptive analysis was possible for the DASS21.

The TRE Intervention

The TRE Provider and Firefighter Training Manager set up the initial TRE training on 25th November 2019 to include participants in a firefighter peer group at a fire station in Iowa.

Prior to commencing TRE training the participants were briefed about the evaluation, completed the DASS21 pre-training questionnaire and agreed that a reminder email would be sent 4-weeks later to complete the post-training questionnaire.

A brief explanation of TRE and its origins with Dr. David Berceli (2008) were given, followed by education on the polyvagal theory, the nervous system discharge that is occurring with tremors and why this is a necessary release of stored muscular tension in all mammals. The TRE provider checked for exercise restrictions or previous injuries, and guided participants to only attempt what felt safe for them to do. The firefighters were given self-regulation guidance such as keeping their eyes open during the process and taking frequent breaks during the tremor process as they deemed necessary. The *Standard TRE Protocol* was demonstrated (Berceli and Phillips, 2020), then the group started with breathing and grounding. During tremors, the TRE provider checked on self-regulation, reminded the group about, and gave permission for breaks when participants were ready. The provider guided participants to notice what they were experiencing in their body and mind. Two participants shared their experience during the active tremoring phase. After taking two breaks, with about 4 minutes of tremoring between, participants completed the third and final tremor set (another 4-5 minutes) before readying for the final rest, and slowly returning to a seated position. Those participants who wished to, shared their experience and what they noticed during and after the tremor phases. The TRE provider answered questions about the process and reminded participants to try the exercises at least four times in the next four weeks (up to a maximum 2-3 times per week). Participants were reminded that the post-follow up questionnaire would be emailed to them in four weeks. After the session, several participants asked additional questions about how TRE could help their fire crews stay more within the "window of tolerance" (Raju Et al, 2012).

Results: Before and after attending TRE Training

Demographics

Nine firefighters (including the Manger of Firefighter Training) completed the Pre-TRE Training depression, anxiety, and stress questionnaire (DASS21). The majority of participants were between 35-44 (n=3; 33.3%) and 45-54 years of age (n=3; 33.3%) with one participant in the 25-34 (11.1%) age group and two (22.2%) in the 55-64 age group. The majority (n=8; 88.9%) had not done TRE before. Two participants reported current illnesses such as sinus issues and infection, back issues, and a thyroid condition.

Depression, anxiety, and stress symptoms: Pre-TRE training group results

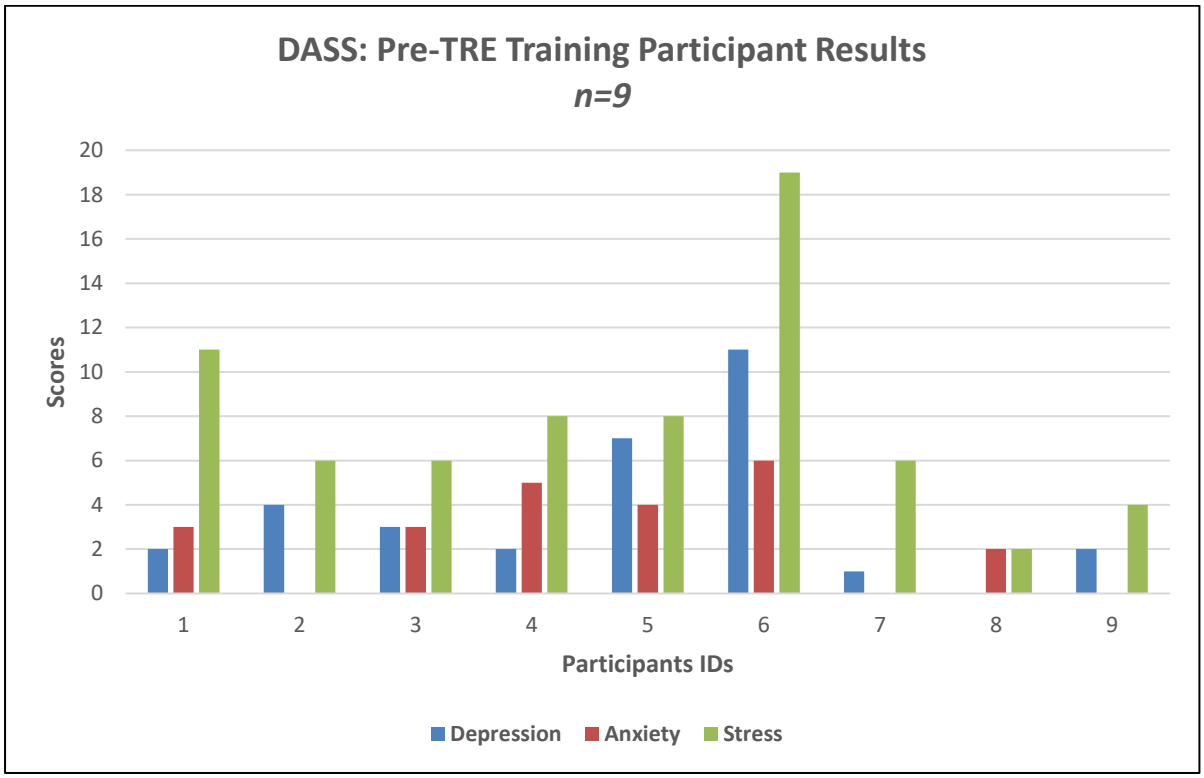
The results of individual participants are reported in figure 1 and show that prior to commencing TRE training 77.8% (n=7) of participants experienced low to no depressive symptoms, with 11.1% (n=1) experiencing a moderate level and 11.1% (n=1) experiencing a severe level of depressive symptoms.

Prior to TRE training, 66.7% (n=6) of participants experienced low to no anxiety, with 22.2% (n=2) experiencing a mild level and 11.1% (n=1) experiencing a moderate level of anxiety.

Stress was the most predominant experience, with 55.6% (n=5) of participants experiencing normal levels of stress, 22.2% (n=2) experiencing a mild level, 11.1% (n=1) experiencing a moderate level, and 11.1% (n=1) experiencing an extremely severe level of stress.

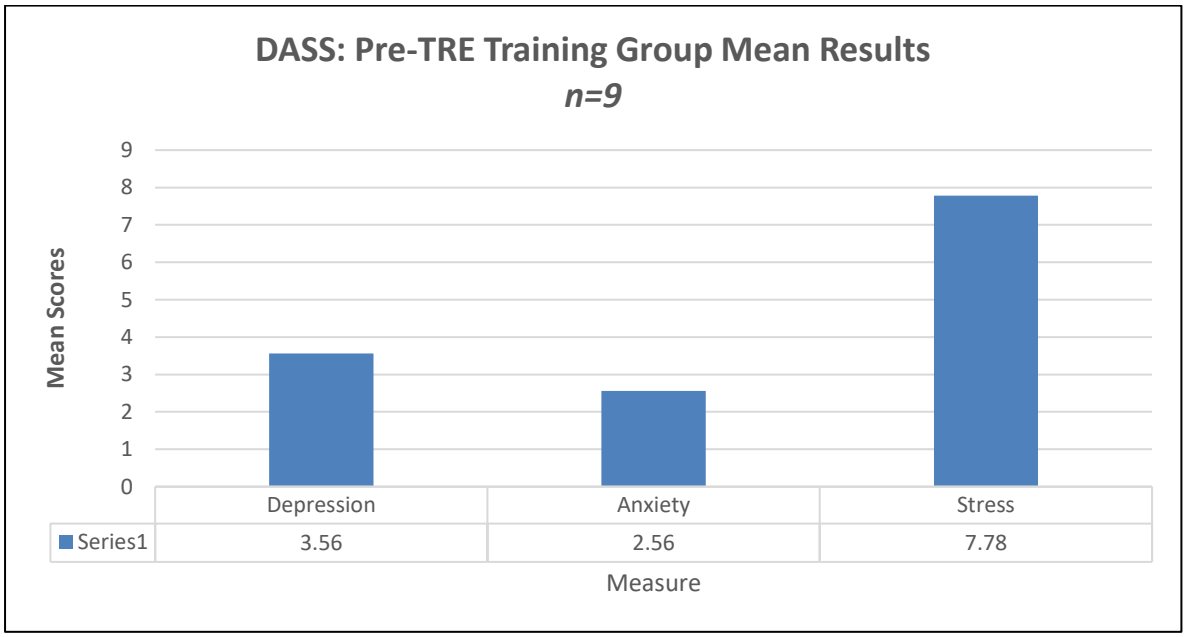
Overall group means are illustrated in figure 2.

Figure 1: Pre TRE training DASS21 results



0=Did not apply to me at all; 1=Applied to me to some degree or some of the time; 2=Applied to me to a considerable degree, or a good part of the time; 3=Applied to me very much, or most of the time

Figure 2: Pre TRE training Group Mean DASS21 results



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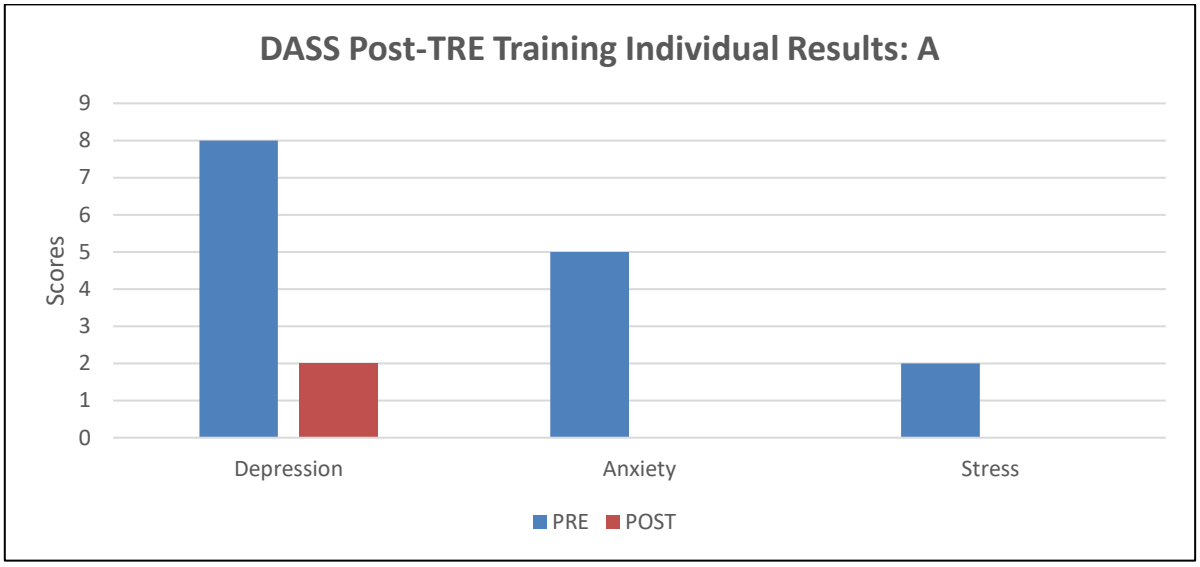
Depression, Anxiety and Stress scale (DASS21): Pre and post training results

Figure 3 illustrates the results of participant 'A' before and after attending TRE training. Prior to TRE training (illustrated in blue) symptoms of depression were moderate, symptoms of anxiety were mild, and stress was within the normal population range. After TRE training (illustrated in red or a zero score not showing), all symptoms decreased and were within normal range (Refer to table 1). Thus, following TRE training there was an improvement of practical significant in all scales, with no symptoms of anxiety or stress reported.

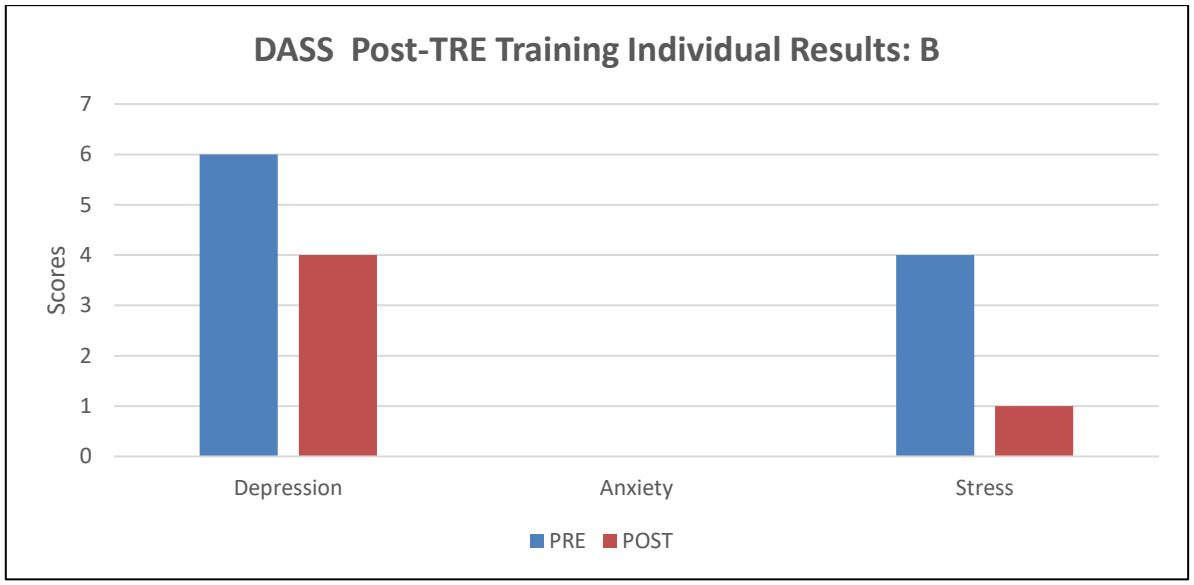
Figure 3: Pre/Post results at 4 weeks: Participant A



A lower score indicates an improvement
Pre: Depression – Moderate; Anxiety – Mild; Stress – Normal range
Post: While there were some symptoms of depression remaining, scores were within normal range

Figure 4 illustrates the results of participant 'B' before and after attending TRE training. Prior to TRE training (illustrated in blue) symptoms of depression were mild, there were no symptoms of anxiety, and stress was within normal population range. After TRE training (illustrated in red or a zero score not showing), all symptoms decreased and were within normal range (Refer to table 1). Thus, following TRE training there was an improvement of practical significant in depression and stress symptoms.

Figure 4: Pre/Post results at 4 weeks: Participant B



A lower score indicates an improvement
Pre: Depression – Mild; Anxiety – nil reported; Stress – Normal range
Post: Depression and stress decreased to within normal range

Table 1: DASS21 cut-off scores

	Depression	Anxiety	Stress
Normal	0 - 4	0 - 3	0 - 7
Mild	5 - 6	4 - 5	8 - 9
Moderate	7 - 10	6 - 7	10 - 12
Severe	11 - 13	8 - 9	13 - 16
Extremely Severe	14+	10+	17+

Qualitative data from subsequent TRE Training conducted

Qualitative data from the firefighter group in this study was not formally collected and is unavailable.

However, qualitative data from military and first responder clients is reported below as a means of giving some insight into their experiences following TRE.

> *When I was first introduced to TRE from Heather, I thought what type of witch doctor medicine is this? After it was explained that animals have this same release mechanism, I figured I'd give a try. After the first session I realized how relaxed and good I felt, it was like getting a whole-body massage but amplified. Since that first time I weekly go thru the exercises to help deal with stress. With first responder stress, home, family, and what nature puts our bodies thru, my body lets me know when it's time. It has even helped with my sleep, and I have less sleep disturbances that keep me from getting adequate rest. Definitely will continue to use this! (First Responder - T.S.J.)*
>
> *TRE has helped me with recovering from my head injury after an IED explosion. My headaches are way down. I also feel less angry and am not drinking as much as before I started. I don't have such a short fuse when I am doing the exercises. (Military personnel - A.S.).*

Discussion, limitations, and strengths

The primary aim of the TRE training was achieved; that of introducing TRE training to firefighters as an acceptable and feasible method to use themselves to reduce stress, anxiety, and depressive symptoms.

The secondary aim of measuring these effects in a group of firefighters was only minimally achieved because only two participants completed the post-TRE training questionnaire at 4-weeks. It is important to note, that 4-weeks after training was entering into the holiday season when many people are preoccupied with other concerns. A further limitation is that the participants were a self-selecting group, using a self-report measure, and qualitative data was not collected.

Whilst the findings from two of the participants in this evaluation study showed considerable improvement, they are unable to be generalised to the first responder population. Thus, larger studies are required.

Results of this small evaluation case study and other TRE observational pre/post-intervention studies show the positive effects of TRE, and are valuable for providing the evidence, rationale, and inclusion in grant applications for funding for a TRE randomized controlled trial (RCT). Longitudinal studies, with an active control group are recommended for future research into the effects of TRE. Furthermore, ongoing research needs to be evaluated by researchers external to the TRE community.

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Conclusion

TRE is an acceptable, feasible, cost-effective, and non-invasive method that can be easily learned and used by first responder to reduce stress, anxiety, and depressive symptoms.

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Appendix

DASS 21 NAME _____ DATE _____

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all - NEVER

1 Applied to me to some degree, or some of the time - SOMETIMES

2 Applied to me to a considerable degree, or a good part of time - OFTEN

3 Applied to me very much, or most of the time - ALMOST ALWAYS

		N	S	O	AA	FOR OFFICE USE D	A	S
1	I found it hard to wind down	0	1	2	3			
2	I was aware of dryness of my mouth	0	1	2	3			
3	I couldn't seem to experience any positive feeling at all	0	1	2	3			
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3			
5	I found it difficult to work up the initiative to do things	0	1	2	3			
6	I tended to over-react to situations	0	1	2	3			
7	I experienced trembling (eg, in the hands)	0	1	2	3			
8	I felt that I was using a lot of nervous energy	0	1	2	3			
9	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3			
10	I felt that I had nothing to look forward to	0	1	2	3			
11	I found myself getting agitated	0	1	2	3			
12	I found it difficult to relax	0	1	2	3			
13	I felt down-hearted and blue	0	1	2	3			
14	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3			
15	I felt I was close to panic	0	1	2	3			
16	I was unable to become enthusiastic about anything	0	1	2	3			
17	I felt I wasn't worth much as a person	0	1	2	3			
18	I felt that I was rather touchy	0	1	2	3			
19	I was aware of the action of my heart in the absence of physicalexertion (eg, sense of heart rate increase, heart missing a beat)	0	1	2	3			
20	I felt scared without any good reason	0	1	2	3			
21	I felt that life was meaningless	0	1	2	3			
					TOTALS			

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DASS Severity Ratings

The DASS is a **quantitative** measure of distress along the 3 axes of depression, anxiety[1] and stress[2]. It is not a categorical measure of clinical diagnoses.

Emotional syndromes like depression and anxiety are intrinsically dimensional - they vary along a continuum of severity (independent of the specific diagnosis). Hence the selection of a single cut-off score to represent clinical severity is necessarily arbitrary. A scale such as the DASS can lead to a useful assessment of **disturbance**, for example individuals who may fall short of a clinical cut-off for a specific diagnosis can be correctly recognised as experiencing considerable symptoms and as being at high risk of further problems.

However for clinical purposes it can be helpful to have 'labels' to characterise degree of severity relative to the population. Thus the following cut-off scores have been developed for defining mild/moderate/severe/ extremely severe scores for each DASS scale.

Note: the severity labels are used to describe the full range of scores in the population, so 'mild' for example means that the person is above the population mean but probably still way below the typical severity of someone seeking help (ie it does not mean a mild level of disorder.

The individual DASS scores do not define appropriate interventions. They should be used in conjunction with all clinical information available to you in determining appropriate treatment for any individual.

[1]Symptoms of psychological arousal
[2]The more cognitive, subjective symptoms of anxiety

DASS 21 SCORE

DEPRESSION SCORE	ANXIETY SCORE	STRESS SCORE

Australian population norms

	Depression	Anxiety	Stress
Normal	0 - 4	0 - 3	0 - 7
Mild	5 - 6	4 - 5	8 - 9
Moderate	7 - 10	6 - 7	10 - 12
Severe	11 - 13	8 - 9	13 - 16
Extremely Severe	14 +	10 +	17 +

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