TECHNICAL COMMENTARY

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Forgiveness

Introduction

Forgiveness involves reducing negative thoughts, feelings, and behaviours toward a transgressor, as well as enhancing positive ones. It involves a willingness to abandon resentments, negative judgment, and indifferent behaviour, while fostering compassion, generosity, and love.

Studies have found evidence for both physical and psychological health benefits associated with forgiveness. This is because forgiving has the potential to break cycles of rumination and negative affect, which reduces stress and in turn improves various indicators of health. Long-term forgiveness habits (trait forgiveness) might better predict improved health outcomes than forgiving a specific offender or transgression (state forgiveness).

Method

We have included only systematic reviews (systematic literature search, detailed methodology with inclusion/exclusion criteria) published in full text, in English, from the year 2010 that report results separately for people with PTSD. Reviews were identified by searching the databases MEDLINE, EMBASE, and PsycINFO. When multiple copies of reviews were found, only the most recent version was included. We prioritised reviews with pooled data for inclusion.

Review reporting assessment was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist that describes a preferred way to present a meta-analysis[1]. Reviews with less than 50% of items checked have been excluded from the library. Note that early reviews may have been guided by less stringent reporting checklists than the PRISMA, and that some reviews may have been limited by journal guidelines.

Evidence was graded using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) Working Group approach where high quality evidence such as that gained from randomised controlled trials (RCTs) may be downgraded to moderate or low if review and study quality is limited, if there is inconsistency in results, indirect comparisons, imprecise or sparse data and high probability of reporting bias. It may also be downgraded if risks associated with the intervention or other matter under review are high. Conversely, low quality evidence such as that gained from observational studies may be upgraded if effect sizes are large or if there is a dose dependent response. We have also taken into account sample size and whether results are consistent, precise and direct with low associated risks (see end of table for an explanation of these terms)[2]. The resulting table represents an objective summary of the available evidence, although the conclusions are solely the opinion of staff of NeuRA (Neuroscience Research Australia).

Results

We found two systematic reviews that met our inclusion criteria[3, 4].

- Moderate to high quality evidence suggests increased levels of forgiveness is associated with decreased PTSD symptoms, although the effect may not be significant after adjusting for other trauma outcome variables such as depression, anxiety, anger, rumination, stress, and social functioning.

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Cerci D, Colucci E

Forgiveness in PTSD after man-made traumatic events: A systematic review

Traumatology 2018; 24: 47-54

View review abstract online

Comparison	**Association between PTSD symptoms and forgiveness.**
Summary of evidence	**Moderate to high quality evidence (large sample, appears consistent, unable to assess precision, direct) suggests increased levels of forgiveness is associated with decreased PTSD symptoms.**

Forgiveness

13 studies, N = 3,769

1 study of South Korean medical inpatients and outpatients recovering from automobile accidents found a medium-sized association between increased forgiveness and decreased PTSD symptoms (r = -0.55, p < 0.001).

1 study of Israel Palestinian and Jewish adolescents found small associations between decreased forgiveness and increased PTSD symptoms (r = 0.12 to 0.29, p < 0.001). There were no significant associations between ability to forgive or revenge and symptoms.

1 study of South African survivors of human rights abuses found an association between increased forgiveness and decreased PTSD symptoms (p = 0.03).

1 study of Turkish veterans injured in terrorist attacks during military service found a small association between increased forgiveness and decreased PTSD symptoms (r = -0.28, p < 0.01) and depression (r = -0.27, p < 0.01).

1 study of Iranian veterans exposed to combat in the Iran–Iraq 1980–1988 conflict found a medium-sized association between increased forgiveness and decreased PTSD symptoms (r = -0.45, p = 0.0013).

1 study of US college students who experienced interpersonal trauma found a small association between increased forgiveness and decreased PTSD symptoms (r = -0.25, p < 0.05).

1 study of US college students who experienced interpersonal trauma found a small association between increased forgiveness and decreased PTSD symptoms (r = -0.23, p < 0.05).

1 study of US college students with a history of childhood abuse found a medium-sized association between increased forgiveness and decreased PTSD symptoms (r = -0.67, p < 0.001).

1 study of Israeli injured survivors of terror attacks found a medium-sized association between increased forgiveness and decreased PTSD symptoms (r = -0.67, p < 0.01).

1 study of US military veterans presenting to a PTSD outpatient clinic found a small association between decreased forgiveness and increased PTSD symptoms (r = 0.19 to 0.28, p < 0.01).

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1 study of US Iraqi refugees found a small association between forgiveness of the collaborators and less PTSD symptoms (β = -0.22, $p < 0.05$), but forgiveness of the dictator was associated with an increase in PTSD symptoms (β = 0.10, $p < 0.05$). 1 study of New York City residents one year after the September 11th terrorist attack found a relationship between more forgiveness and less perceived stress ($r = -0.28$, $p < 0.05$). 1 study of a Sierra Leone trauma outreach program after the civil war could not establish a correlation between forgiveness and trauma outcomes.

Consistency in results‡	Appears consistent
Precision in results§	Unable to assess; no measure of precision is reported.
Directness of results‖	Direct

Rasmussen KR, Stackhouse M, Boon SD, Comstock K, Ross R

Meta-analytic connections between forgiveness and health: the moderating effects of forgiveness-related distinctions

Psychology and Health 2019; 34: 515-34

View review abstract online

Comparison	**Association between PTSD symptoms and forgiveness.**
Summary of evidence	**Moderate to high quality evidence (large sample, inconsistent, precise, direct) finds no association between PTSD symptoms and forgiveness. However, other symptoms were associated with increased forgiveness such as improvements in depression, anxiety, subjective well-being, anger, negative affect, rumination, stress, and social functioning. Improvements in physical symptoms were also associated with forgiveness, including somatisation, blood pressure, heart rate/problems, and overall physical symptoms.**

Forgiveness

No association between PTSD symptoms and forgiveness;

7 studies, N = 1,901, adjusted $r = 0.005$, 95%CI -0.21 to 0.21, $p > 0.05$, Q$p < 0.001$

Further analyses showed improvements in other mental health symptoms were associated with increased forgiveness. These symptoms included depression, anxiety, subjective well-being, anger, negative affect, rumination, stress, and social functioning. Improvements in physical symptoms were also associated with forgiveness, including somatisation, blood pressure, heart rate/problems, and overall physical symptoms.

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Forgiveness

Consistency in results	Inconsistent
Precision in results	Precise
Directness of results	Direct

Explanation of acronyms

CI = confidence interval, N = number of participants, OR = odds ratio, *p* = statistical probability of obtaining that result, *r* = correlation coefficient

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Explanation of technical terms

* Bias has the potential to affect reviews of both RCT and observational studies. Forms of bias include; reporting bias – selective reporting of results; publication bias - trials that are not formally published tend to show less effect than published trials, further if there are statistically significant differences between groups in a trial, these trial results tend to get published before those of trials without significant differences; language bias – only including English language reports; funding bias - source of funding for the primary research with selective reporting of results within primary studies; outcome variable selection bias; database bias - including reports from some databases and not others; citation bias - preferential citation of authors. Trials can also be subject to bias when evaluators are not blind to treatment condition and selection bias of participants if trial samples are small[5].

† Different effect measures are reported by different reviews.

Prevalence refers to how many existing cases there are at a particular point in time. Incidence refers to how many new cases there are per population in a specified time period. Incidence is usually reported as the number of new cases per 100,000 people per year. Alternatively some studies present the number of new cases that have accumulated over several years against a person-years denominator. This denominator is the sum of individual units of time that the persons in the population are at risk of becoming a case. It takes into account the size of the underlying population sample and its age structure over the duration of observation.

Reliability and validity refers to how accurate the instrument is. Sensitivity is the proportion of actual positives that are correctly identified (100% sensitivity = correct identification of all actual positives) and specificity is the proportion of negatives that are correctly identified (100% specificity = not identifying anyone as positive if they are truly not).

Weighted mean difference scores refer to mean differences between treatment and comparison groups after treatment (or occasionally pre to post treatment) and in a randomised trial there is an assumption that both groups are comparable on this measure prior to treatment. Standardised mean differences are divided by the pooled standard deviation (or the standard deviation of one group when groups are homogenous) that allows results from different scales to be combined and compared. Each study's mean difference is then given a weighting depending on the size of the sample and the variability in the data. Less than 0.4 represents a small effect, around 0.5 a medium effect, and over 0.8 represents a large effect[5].

Odds ratio (OR) or relative risk (RR) refers to the probability of a reduction (< 1) or an increase (> 1) in a particular outcome in a treatment group, or a group exposed to a risk factor, relative to the comparison group. For example, a RR of 0.75 translates to a reduction in risk of an outcome of 25% relative to those not receiving the treatment or not exposed to the risk factor. Conversely, a RR of 1.25 translates to an increased risk of 25% relative to those not receiving treatment or not having been exposed to a risk factor. A RR or OR of 1.00 means there is no difference between groups. A medium effect is considered if RR > 2 or < 0.5 and a large effect if RR > 5 or < 0.2[6]. lnOR stands for logarithmic OR where a lnOR of 0 shows no difference between groups. Hazard ratios measure the effect of an explanatory variable on the hazard or risk of an event.

Correlation coefficients (eg, r) indicate the strength of association or relationship

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between variables. They can provide an indirect indication of prediction, but do not confirm causality due to possible and often unforseen confounding variables. An r of 0.10 represents a weak association, 0.25 a medium association and 0.40 and over represents a strong association. Unstandardised (*b*) regression coefficients indicate the average change in the dependent variable associated with a 1 unit change in the independent variable, statistically controlling for the other independent variables. Standardised regression coefficients represent the change being in units of standard deviations to allow comparison across different scales.

‡ Inconsistency refers to differing estimates of effect across studies (i.e. heterogeneity or variability in results) that is not explained by subgroup analyses and therefore reduces confidence in the effect estimate. I^2 is the percentage of the variability in effect estimates that is due to heterogeneity rather than sampling error (chance) - 0% to 40%: heterogeneity might not be important, 30% to 60%: may represent moderate heterogeneity, 50% to 90%: may represent considerable heterogeneity and over this is considerable heterogeneity. I^2 can be calculated from Q (chi-square) for the test of heterogeneity with the following formula[5];

$$I^2 = \left(\frac{Q - df}{Q}\right) \times 100\%$$

§ Imprecision refers to wide confidence intervals indicating a lack of confidence in the effect estimate. Based on GRADE recommendations, a result for continuous data (standardised mean differences, not weighted mean differences) is considered imprecise if the upper or lower confidence limit crosses an effect size of 0.5 in either direction, and for binary and correlation data, an effect size of 0.25. GRADE also recommends downgrading the evidence when sample size is smaller than 300 (for binary data) and 400 (for continuous data), although for some topics, these criteria should be relaxed[7].

‖ Indirectness of comparison occurs when a comparison of intervention A versus B is not available but A was compared with C and B was compared with C that allows indirect comparisons of the magnitude of effect of A versus B. Indirectness of population, comparator and/or outcome can also occur when the available evidence regarding a particular population, intervention, comparator, or outcome is not available and is therefore inferred from available evidence. These inferred treatment effect sizes are of lower quality than those gained from head-to-head comparisons of A and B.

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