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The efficacy of interventions for test anxiety in university students: A protocol for a systematic review and meta-analysis

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ABSTRACT

The relative efficacy of interventions for test anxiety in university students is unknown. Previous meta-analyses have reported treatment outcomes across all age groups rather than specifically reporting on the effects for university students. Therefore, a new review is needed to determine the efficacy of psychological, educational, and pharmacological interventions for university students and the potential moderators of intervention efficacy. We present a protocol for a new review, which will enable a balanced and up-to-date appraisal of interventions in this field. Results from this review will therefore be of considerable interest to both students and those involved in the provision of interventions. Systematic review registration: PROSPERO CRD42016035859.

1. Introduction

Anxiety about examinations – test anxiety – has long been recognised as a pervasive and serious problem (Sarason, 1984, 1988; Spielberger, 1980; Spielberger, Anton, & Bedell, 1976). It is estimated that 20–25% of university students are highly test-anxious (Hahne, Lohmann, & Krzyszycha, 1999, cf. Neuderth, Jabs, & Schmidtke, 2009; Hill and Wigfield, 1984; Naveh-Benjamin, Lavi, 1997; Saravanan, Kingston, & Gin, 2014). Test anxiety is conceptualised as a situation-specific personality trait in which an individual experiences anxiety before, during, and after a performance-evaluative situation (Spielberger & Vagg, 1995; Zeidner, 1998). Test anxiety consists of two dimensions; a cognitive dimension labelled 'Worry' and an affective dimension labelled 'Emotionality' (Liebert & Morris, 1967; Spielberger, 1980). Worry consists of perseverative thinking about the personal and social consequences of failing to obtain one's performance goals and attentional distraction from the task-at-hand (e.g. test-irrelevant thinking). Emotionality refers to the perception of affective and physiological arousal in performance-evaluative situations.

Test anxiety is associated with poorer examination performance (Hembree, 1988; Seipp, 1991; Richardson, Abarham, & Bond, 2012). High-test-anxious (HTA) individuals typically score a half a standard deviation less than their low-test-anxious (LTA) peers in examinations (Seipp, 1991). Worry is more strongly associated with poorer exam performance than Emotionality ($r = -0.30$ vs. -0.15) (Hembree, 1988; Seipp, 1991). HTA students also report poorer mental health (Depreeuw & De-Neve, 1992) and are more likely to repeat years of study or dropout than their LTA peers (Schaefer, Mattheß, Pfitzer, & Köhle, 2007 cf. Neuderth et al., 2009). Moreover, in a study investigating clinical manifestations of test anxiety, over 50% of participants had comorbid depression or a specific phobia (Herzer, Wendt, & Hamm, 2014).

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Several psychological and educational interventions have been used to reduce test anxiety, and in turn improve academic performance. Psychological interventions aim to reduce anxiety based on the premise that anxiety is the major contributor to poor test performance. In contrast, educational interventions state that HTA students have limited study and test-taking skills and it is the failure to adequately prepare for, and undertake, a test that gives rise to decreased test performance. Here, test anxiety arises from a student's awareness that they are ill prepared to meet the demands of the test. The aim of educational-based interventions then is to improve test-taking and learning skills of students.

Three main psychological approaches have been used to treat test anxiety: behavioural therapy (BT), cognitive therapy (CT), and cognitive-behavioural therapy (CBT). BT, such as systematic desensitization (Wolpe, 1958) or applied relaxation (Bernstein & Borkovec, 1973), principally targets the somatic symptoms of test anxiety, whilst CT, such as rational-emotive therapy (Ellis, 1962) or schema-based therapy (Beck, Emery, & Greenberg, 1985), targets cognitive beliefs and structures for modification. CBTs combine treatment principles from both BT and CT approaches.

There are two main forms of educational intervention for test anxiety; 'Test-wiseness' training that focuses on the skills needed to take an examination (e.g. surveying a written test to ascertain which questions are given greater marks and so require more time and attention) and Study Skills Training (SST) that focuses on ways of learning and encoding material in the most optimal way (e.g. more emphasis on deeper levels of processing of to-be-learned material and less emphasis on rote memorization) (e.g. Culler & Holahan, 1980; Kirkland & Hollandsworth, 1979). Both forms are frequently combined into one intervention package.

The interventions discussed above have all been examined in controlled research studies. Randomized controlled trials (RCTs) represent the gold standard in determining treatment efficacy as randomization, given sufficient numbers, ensures that both known and unknown prognostic factors are evenly distributed across treatment conditions, and therefore enable causal inferences to be drawn. However, many of the trials conducted in the test anxiety literature have had low statistical power to detect treatment effects as a result of using relatively small sample sizes—frequently less than 20 participants per treatment arm. This raises the risk of rejecting potentially useful treatments (a Type II error). Meta-analysis represents the best methodology for overcoming this problem; by systematically synthesizing trial outcome data, it increases statistical power and permits the calculation of more precise estimates of treatment effects.

1.1. Previous meta-analytic reviews

Two meta-analytic reviews of psychological and educational interventions for test anxiety have been conducted that included controlled trials with university student cohorts. In reporting the findings from these reviews, we focus on results pertaining to university students.

The first meta-analytic review (Hembree, 1988), analysed psychological and educational test anxiety outcome studies published between 1952 and 1986. Outcome studies had to include one or more active treatment conditions compared against a control condition. One hundred and thirty seven studies were included in the analyses ($n = 7641$), though it is not known how many of these studies had university student samples. Between-groups effects sizes comparing active treatments versus control conditions were calculated, using Cohen's d, and effects were synthesized using a fixed-effect model. No overall mean effect was produced for all psychological and educational interventions, but a total of 14 summary effects were produced for differing treatment approaches. However, only four effect sizes were produced that included studies whose samples consisted exclusively of university students: cognitive-behavioural therapy (CBT) ($d = 0.87$), 'taped individual' systematic desensitization ($d = 0.59$), 'other styles' of systematic desensitization ($d = 1.08$), and SST ($d = 0.14$). Examination of follow-up data revealed that BT ($d = 1.21$) and CBT ($d = 0.96$) were superior to untreated control groups. However, the median follow-up period for studies in this analysis was just 6 weeks. Finally, it was also found that participants receiving an intervention showed improved academic performance at post-treatment ($d = 0.42$) and at follow-up ($d = 0.45$) relative to those in the untreated control conditions, though it is not known which studies, and therefore samples, were included in these analyses.

The most recent meta-analytic review (Ergene, 2003) of interventions for test anxiety included psychological and educational outcome studies published between 1966 and 1998. Outcome studies had to include one or more active treatment conditions compared against a control condition. However, in contrast to Hembree (1988), random assignment of participants to conditions was explicitly stated in the eligibility criteria. Fifty-six studies were included in the analyses ($n = 2428$), but again it is not known how many of these studies focused solely on university samples. Between-groups effects sizes comparing active treatment against a control condition were calculated using Cohen's d, and summary effects were synthesized using a fixed-effect model. An overall mean effect size of $d = 0.68$ (95% CIs 0.59–0.77) was computed across all interventions for university students but it is not reported how many studies – and what active conditions – contribute to this analysis. Though summary effect sizes were calculated for different treatment approaches (e.g. BT, CT), these were produced by synthesizing data from all age groups (from primary/elementary school to university student samples). Durability of treatment effects was not examined as no follow-up data was reported nor was the effect of the interventions on academic performance examined.

1.1.1. A brief critique previous reviews

We have identified several reporting and methodological problems with the previous meta-analytic reviews that limit the conclusions that can be drawn from them.