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Review article

Alexithymia in eating disorders: Systematic review and meta-analyses of studies using the Toronto Alexithymia Scale

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ABSTRACT

Objective: The aim of this review was to synthesise the literature on the use of the Toronto Alexithymia Scale (TAS) in eating disorder populations and Healthy Controls (HCs) and to compare TAS scores in these groups.
Method: Electronic databases were searched systematically for studies using the TAS and meta-analyses were performed to statistically compare scores on the TAS between individuals with eating disorders and HCs.
Results: Forty-eight studies using the TAS with both a clinical eating disorder group and HCs were identified. Of these, 44 were included in the meta-analyses, separated into: Anorexia Nervosa; Anorexia Nervosa, Restricting subtype; Anorexia Nervosa, Binge-Purge subtype, Bulimia Nervosa and Binge Eating Disorder. For all groups, there were significant differences with medium or large effect sizes between the clinical group and HCs, with the clinical group scoring significantly higher on the TAS, indicating greater difficulty with identifying and labelling emotions.
Conclusion: Across the spectrum of eating disorders, individuals report having difficulties recognising or describing their emotions. Given the self-report design of the TAS, research to develop and evaluate treatments and clinician-administered assessments of alexithymia is warranted.

1. Introduction

Alexithymia, meaning literally "no words for mood" [1] was first coined in the 1970s to define an inability to describe and/or recognise one's own emotions. Since then, research has focused on both understanding alexithymia and on measuring it in both clinical and general populations. Alexithymia is known to be present in several psychiatric disorders, including depression [2]; Obsessive-Compulsive Disorder [3]; Schizophrenia [4]; Post-Traumatic Stress Disorder [5]; Autism Spectrum Disorder [6] and eating disorders (EDs) [e.g., 7]. While alexithymia is described as a stable personality trait [8] it correlates highly with symptoms of both depression and anxiety and may be a predisposing factor for the development of other psychopathologies [9]. What's more, alexithymia is thought to underlie emotional difficulties in individuals with eating disorders [10] and has been implicated in both the development and maintenance of EDs [11]. It is also related to poorer treatment outcome, making it a relevant treatment target [12].

Prevalence estimates of alexithymia within the general population, as measured by the twenty-item Toronto Alexithymia Scale [TAS-20; 13], range from 5.2 to 18.8%, with a prevalence of 18% being reported in a British undergraduate sample [14]. In this study, alexithymia was found be to be more prevalent in females than in males. Alexithymia is also associated with higher levels of sub-clinical disordered eating in undergraduate females [15], mirroring what has been found in ED populations [16–18].

One of the main focuses of alexithymia research has been how to effectively measure the concept. The development of the TAS-20 [13] resulted in increased interest in this field as it provides an efficient way to measure alexithymia, allowing for comparability across clinical groups [9]. The TAS-20 is a brief, self-report measure on which participants rate their level of agreement to statements on a five-point Likert scale, yielding a total score as well as subscale scores designed to measure: difficulty identifying feelings (DIF); difficulty describing feelings (DDF) and externally-oriented thinking (EOT). The maximum possible score on the TAS-20 is 100 with a score of 61 or above indicative of high levels of alexithymia [19]. The TAS-20 demonstrates good reliability and factorial validity [20,21]. Despite the TAS being widely used, normative data for ED populations have not yet been

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reported. Synthesising studies comparing scores on the TAS in ED groups with Healthy Controls (HCs) would therefore aid comparison between existing and future studies.

The TAS-20 has been criticised for not measuring a universal alexithymia construct but perhaps instead measuring concepts such as social shame [22], negative emotional expressivity [23] or negative affect [24]. The factor structure of the TAS-20 may also vary across samples [25], highlighting the need to use the TAS-20 in combination with other measures of alexithymia [26]. Disagreement exists over exactly which constructs instruments are measuring and there is still a need for reliable, objective measures of alexithymia for use across psychiatric populations. Determining whether individuals with EDs consistently score higher on the TAS than controls would be useful for future research, aiming to develop new ways of measuring alexithymia in this population.

In a critical review of the literature on alexithymia in EDs, Nowakowski, McFarlane [18] report that individuals with EDs consistently report higher levels of alexithymia on the TAS than controls. However, as this review did not include meta-analysis of studies, it is not known whether the effect size is the same across the spectrum of EDs, e.g., in Anorexia Nervosa (AN), Bulimia Nervosa (BN) or Binge ED (BED), or whether a particular diagnosis is associated with higher levels of alexithymia. Nowakowski, McFarlane [18] report that individuals with EDs score higher on two of the TAS-20 subscales: DDF and DIF but not on EOT. Performing meta-analyses of subscale scores will help synthesise this literature further and to determine whether significant differences exist between groups on all sub-scale scores.

1.1. Aims of the study

This review aimed to synthesis the literature on the use of the Toronto Alexithymia Scale to assess alexithymia across the spectrum of eating disorder and to compare total and sub-scale scores on the Toronto Alexithymia Scale between eating disorder diagnoses.

2. Method

The systematic review and meta-analysis was conducted according to the PRISMA statement [27]. The quality of each study was assessed using the Clinical Appraisal Skills Programme checklist for case–control studies [28]. The tool consists of 11 questions, which yield a mixture of 'yes', 'no' and more qualitative answers. In this review, extra questions were added to more fully appraise the specific qualities of studies addressing alexithymia in EDs. These included whether confounding variables were accounted for in analysis and whether association between the TAS scores and other psychopathologies was examined. To calculate an overall quality rating, several questions were split into sub questions and a score of 1 was awarded for every 'yes' answered, with a maximum possible score of 17. The quality rating for each study is shown in Table 1.

2.1. Eligibility criteria

Studies using either the TAS-20 or TAS-26 with both a clinical ED population and HCs were included in the review. Inclusion criteria were: 1) full text available in English; 2) reporting mean and standard deviation TAS total scores for both groups; 3) published in a peer-reviewed journal.

2.2. Information sources and search

The electronic databases PsychInfo, Scopus, Pubmed and Web of Science were searched systematically for papers up to and including May 2017. The search terms were either Anorexia Nervosa, Bulimia Nervosa or ED and alexithymia or Toronto Alexithymia Scale. With the exception of being published in a peer-reviewed journal, no other search limits were applied. The reference list of a previously published review [18] was also screened for relevant studies.

2.3. Selection

The titles of papers were screened for relevance and the abstracts of those that appeared to meet the criteria were then screened by both the first and second authors. Full texts were retrieved if the abstract indicated that the inclusion criteria had been met or if the details of the study were ambiguous. The first and second author discussed all full-texts and reached consensus about whether to include them in the review. Any full-texts which did not meet the inclusion criteria were excluded. The number of papers reviewed at each stage of the review process, including reasons for exclusion at full-text screening, is displayed in Fig. 1.

2.4. Data collection and items

The following data were extracted from each included paper: diagnosis of clinical group; mean age; mean BMI; mean ED duration; how the clinical and HC groups were matched; TAS version; mean TAS scores, including subscale scores if the TAS-20 was used; recruitment site; percentage of female participants; diagnostic tool used and any comorbidities which were assessed.

2.5. Risk of bias in individuals studies

Risk of bias within each study was assessed by considering how the methodology may impact on the results i.e., how clinical groups were matched to HCs, where participants were recruited from and how ED pathology was assessed.

2.6. Summary measure

The principle measure used for meta-analysis was the difference in mean scores and standard deviations on the TAS and any reported subscale scores.

2.7. Synthesis of data

For the purposes of meta-analyses, studies were split into different ED diagnoses: AN; AN binge-purge type (AN-BP); AN restricting type (AN-R), BN and BED. Studies which included more than one diagnostic group e.g. AN and BN as well as HCs were included in each respective meta-analysis separately. The meta-analyses were performed by pooling the standard effect sizes using a random effects model. This model assumes that as well as within-group variability in scores, mean effect size is also caused by differences between studies. The random-effects model includes between study heterogeneity, resulting in estimates with wider confidence intervals than fixed-effect models. Individual meta-analyses were also run for each of the TAS-20 subscale scores, again split into different diagnostic groups.

2.8. Statistical analysis

All meta-analyses were conducted using Review Manager 5.3 [29]. Cohen's *d* [30] was used to estimate effect sizes using the following interpretation: small (0.2), medium (0.5) and large (0.8). Positive effect sizes indicate that the clinical group scored higher on the TAS than the control group. A p value of < 0.05 indicates a significant difference between the clinical group and HCs. To assess the potential impact of moderator variables on the results of the meta-analysis, meta-regression was performed using STATA 13 [31] with the following user-contributed command: *metreg* [32].