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Emotion awareness and cognitive behaviour therapy in young people with autism spectrum disorder

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Research report

Emotion awareness in young people with autism spectrum disorder

Abstract

Young people (YP) with autism spectrum disorder (ASD) experience high levels of emotional problems, including anxiety and depression. Adapted Cognitive Behaviour Therapy (CBT) is recommended for such difficulties. However, no evidence suggests whether emotion awareness is important in treatment outcome for YP on the Autism Spectrum (YPASD). This study aimed to investigate potential differences in emotion awareness between: 1) YPASD and typically developing youth; and 2) YPASD with and without experience of CBT. Three groups (aged 11-20 years) participated; (1) typically developing YP (n=56) and (2) YPASD (n=23), both with no experience of CBT and (3) YPASD who had attended CBT (n=33). All participants completed the Emotion Awareness Questionnaire (EAQ-30). YPASD differed significantly from typically developing YP on the emotional awareness measure. YPASD who had attended CBT scored significantly lower on the Differentiating Emotions subscale, and significantly higher on the Attending to Others' Emotions subscale, compared to YPASD who had not attended CBT. This study highlights the importance of psycho-educational components of CBT when adapting for YP on the autism spectrum.

Keywords: Autism spectrum disorders, young people, CBT, prerequisite skills

Introduction

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterised by qualitative impairments in social communication, and a restricted, repetitive pattern of interests and behaviours (American Psychiatric Association, 2013). It is estimated that 1% of children and young people (YP) have ASD (Baird et al., 2006). Rates of mental health problems in YP with ASD have been reported to be high, with between 11% and 84% of YP with ASD having an anxiety disorder (White et al., 2009;) and almost a fifth identified as having depression (Kim et al., 2000). There is growing evidence to support CBT as an effective intervention for anxiety in YP with ASD (Sukhodolsky et al., 2013; Ung et al., 2015) with adaptations tailored to meet the needs of this group (Walters et al., 2016). Included in the 7 adaptations to amend cognitive behavioural approaches in line with the needs of YP with ASD is emotion recognition training (National Institute for Health and Clinical Excellence, 2013).

Emotion Awareness

Self-awareness is assumed not to be a unitary concept, spanning across both the psychological and physical self; for example, 'theory of *own* mind' refers to the ability to understand one's own emotions, thought processes and beliefs, and make sense of our behaviours (Williams, 2010). Children with ASD are known to struggle with introspection, awareness of their own and others emotions (Tanaka et al., 2012; Williams and Happé, 2010). Emotion awareness has been defined as "an attentional process that serves to monitor and differentiate emotions, locate their antecedents, but ignore the physical arousal that is part of the emotion experience" (Rieffe et al., 2011: p. 656). Alexithymia is often used in the literature to denote 'a limited ability to recognise, differentiate, and verbalise an individuals' own emotions' (Kooiman et al., 2002). Studies of typically developing YP suggest that alexithymia and impaired emotion awareness (e.g.

differentiating between emotions, communicating them to others, identifying their causes, and a focus on bodily arousal) are related to increased depression and anxiety (Rieffe et al., 2006; Rieffe et al., 2008; Rieffe et al., 2010).

Studies of YP with ASD have found elevated alexithymia scores on both self-report and parent-report measures when compared to a typically developing control group (Griffin et al., 2016). On an emotion identification task, children with ASD (mean age 10 years 2 months) had greater difficulty identifying, differentiating between, and understanding the antecedent to their own emotions than typically developing children (Rieffe et al., 2007). Differences have also been found between typically developing groups and those with ASD (aged 7-12 years) on an emotion recognition task, although the focus was recognition of emotion in others rather than introspection itself (Lickel et al., 2012).

The role of emotion differentiation and awareness in co-morbid emotional problems for YP with ASD has not yet been investigated. A study using self-report methods to consider whether emotions can be viewed as important in analysing problems, and awareness of bodily symptoms during emotional experiences in YP with ASD (mean age 11 years 5 months) found that these factors did not contribute significantly to internalising symptoms (Rieffe et al, 2011). However, completion of measures of internalizing symptoms (such as depression and anxiety) are dependent on emotion awareness itself. Recommended adaptations to psychological therapies for YP with ASD include emotion recognition training (National Institute for Health and Clinical Excellence, 2013) and improvements in emotion recognition abilities of children with autism following training have been demonstrated (e.g. Golan et al. 2010).

The Current Study

Growing awareness of the high rates of comorbid emotional disorders in YP with ASD mean there is a greater need for effective treatments and to better understand treatment mechanisms (Wing and Potter, 2009). However, there is no evidence to suggest whether emotion awareness is important for outcome in CBT with YP with autism. Research of general samples of YP with ASD have found differences in emotion recognition skills but it is not clear how these link to emotional disorders and outcome in CBT. The current study therefore aims to consider the emotional prerequisites for CBT in YP with ASD by comparing levels of emotion awareness in YP with and without autism, and YP with autism who have attended CBT following clinical referral for an emotional disorder.

Hypotheses

- YP with ASD will score lower on a task of emotion awareness than typically developing YP
- YP with ASD who have attended CBT for help with an emotional disorder will score lower on a task of emotion awareness than YP with ASD who have not been clinically referred for CBT for an emotional disorder

Method

An independent-measures design was used with three participant groups to compare scores on an emotion awareness task. Ethical approval was granted by the West of Scotland Research Ethics Service (ref. 15/WS/0111), and the University Ethics Committee (ref. 15-156/15-107).

Participants

Three groups of YP (age 11-20 years) participated: 1) a control group of 242 typically developing YP (190 female, 52 male) with no experience of CBT were recruited through local schools and University open days; 2) 23 YP with ASD with no experience of CBT were recruited through local schools, charities, and social media; 3) 33 YP with ASD who had attended CBT. Of these 33, 20 were YP with ASD referred by clinicians from 12 local Child and Adolescent Mental Health Services (CAMHS). The remaining 13 participants had been recruited for the study via the general recruitment pathway but disclosed prior experience of CBT at study assessment and thus were included in the CBT group post-hoc. These 13 had incomplete data in respect of self and clinician administered treatment outcome.

Of the 33 participants with prior attendance at CBT, they had attended a range of local and national services and thus their experience of CBT was diverse. Intervention had not been part of a systematic protocol or manualised intervention. Clinicians delivering the CBT included Clinical Psychologists and specialist CBT practitioners. Presenting problems included generalised anxiety, social anxiety, obsessive-compulsive disorder, depression, and anger.

Inclusion criteria for the ASD group were: 1) a clinical diagnosis of an ASD (including Asperger's syndrome) as assessed by the relevant local paediatric or CAMHS team, based on ICD-10 criteria. Their ASD diagnosis was verified by their school or parent. Exclusion criteria were: 1) currently an inpatient; and 2) a documented or suspected intellectual disability.

Measures

Emotion awareness: This was measured using the Emotion Awareness Questionnaire-30 item version (EAQ-30; Rieffe et al., 2008). This self-report questionnaire aims to identify how YP (aged 9-16 years) feel or think about their feelings. The EAQ-30 has good internal consistency (α=.64-.77) and construct validity (α=.82-.93) (Rieffe et al., 2008). It has a six-factor structure of emotional functioning: 1) Differentiating Emotions; 2) Verbal Sharing of Emotions; 3) Bodily Awareness of Emotions; 4) Not Hiding Emotions; 5) Analyses of Emotions; 6) Attention to Others' Emotions. Each question is rated on a three-point scale (1=not true, 2=sometimes true, 3=often true). A higher score represents a higher presence of this ability, apart from Bodily Awareness where higher scores indicate less attention to bodily symptoms.

Treatment Outcome: Routine outcome measurement was generally used by the services participants had attended. However, the diversity of services and thus measurement protocols meant that consideration of pre-post treatment symptom changes across the group was not possible. Thus we asked Clinicians and YP to rate the YP's improvement since attending therapy using the Clinical Global Impression–Improvement (CGI-I) scale (Busner and Targum, 2007). The CGI-I is a 7-point scale from 1 ('very much improved') to 7 ('very much worse'). Scores of 1 or 2 represent successful treatment.

Procedure

All participants and parents/guardians were given information sheets, and informed consent/assent was sought prior to participation. All participants were assigned an identification number which is only associated with their name on a password protected database in accordance with the Data Protection Act (1998). All three groups completed the EAQ-30 in person

or via post. Within the CBT group, 25 YP had completed a course of CBT sessions in the previous 12 months. Eight YP were still attending CBT at the time of participation, but had completed more than six sessions**.** Once they had taken part, all participants were debriefed.

Data analytic strategy

Mixed analysis of covariance (ANCOVA) was planned to address the primary hypothesis and the secondary hypothesis, controlling for age. Where group x EAQ-30 scale interactions are significant, simple main effects are carried out using univariate analyses, and Bonferroni corrections are applied to *p*-values using SPSS where multiple analyses are conducted. A power analysis using G*power indicated that to examine the difference between two independent means, with a large effect size (d=0.8, α err prob=0.05, power=0.8), 21 participants were required in each group. Due to the exploratory nature of this study and the lack of previous research in this area, a large effect size is acceptable.

The two groups with ASD were combined (n=56; 19 females, 37 males) to address the primary hypothesis. Given that the ASD group contained a greater proportion of males and the control group comprised a large number of females (n=242; 190 female, 52 male), 56 of the control group were matched by gender to those with ASD. Additionally, as age is known to impact on emotion awareness (Lickel et al., 2012), the control group were also matched to the ASD group by age. Matching was carried out using a database containing the age and gender of the participants with ASD alongside a database of the control group, each ordered by age. The first participant from the control group that matched the age and gender of each participant in the ASD group was chosen, resulting in a total of 19 females and 37 males of the same age in each group (total n=56).

Results

Participant Demographics

Three groups took part in the study: 1) A matched control group of YP without ASD and no experience of CBT (n=56, 19 female, 37 male, mean age 15 year 6 months); 2) YP with ASD who had no experience of CBT (n=23, 5 female, 18 male, mean age 15 years 4 months); 3) YP with ASD who had attended CBT (n=33, 14 female, 19 male, mean age 15 years 9 months). Pearson's chi-square showed no significant difference between the three groups for gender, X^2 (2) = 2.587, p=.274. A One-Way Analysis of Variance (ANOVA) found no significant differences between the three groups for age, F(2,109)=.234, p=.792.

Of the group with ASD who had attended CBT, 20 had been seen referred from local CAMHS (9 female, 11 male, mean age 14 years 10 months). A total of 35 YP who were attending CBT at CAMHS were invited to participate, and 20 (57%) consented to take part. Reasons for not partaking included pending exams and it not being appropriate in terms of their current mental health. Of these 20 local CAMHS YP with ASD who had attended CBT, 18 (90%) reported an overall positive experience of CBT, and 2 (10%) reported a negative experience. On the CGI-I, 6 (30%) participants rated themselves as 1='very much improved', 8 (40%) as 2='much improved' and 5 (25%) as 3='minimally improved'. One participant did not answer this question. No participants rated themselves as having experienced 4='no change from baseline' or getting worse. In respect of clinician ratings, 2 clinicians (10%) rated the YP with ASD who had attended CBT as 1='very much improved', 13 (65%) provided ratings of 2='much improved', 4 (20%) as 3='minimally improved', and 1 clinician noted the CGI-I score as 4='no change from baseline'.

Hypothesis 1: YP with ASD will score lower on a task of emotion awareness than typically developing YP

A mixed ANCOVA examined the group x EAQ-30 interaction for the control group (n=56) and YP with ASD (n=56). Given that the assumption of sphericity was violated, $X^2(14)=65.09$, $p=.001$, and as estimates of sphericity are ε>0.75, Huynh-Feldt corrected values are reported.

The main effect of the EAQ-30 subscales was not significant within-subjects, suggesting that irrespective of group, average ratings on the EAQ-30 subscales were similar, $F(4.26,464.19)=2.14$, $p=.071$. The covariate, age, significantly interacted with the EAQ-30, indicating that when group is not considered, scores on the EAQ-30 are affected by age, $F(4.26,464.19)=4.15$, $p=.002$. However, the main effect of age between-subjects was not significant, suggesting age was similar across groups, $F(1,109)=0.63$, $p=.429$.

The group x EAQ-30 interaction was significant, suggesting that the profile of ratings across the scales are different for the groups, $F(4.26,464.19)=4.64$, $p=.001$. There was also a significant main effect of group between-subjects, with the ASD group scoring significantly lower overall on the EAQ-30, $F(1,109)=22.22$, $p=.001$ (see Figure 1).

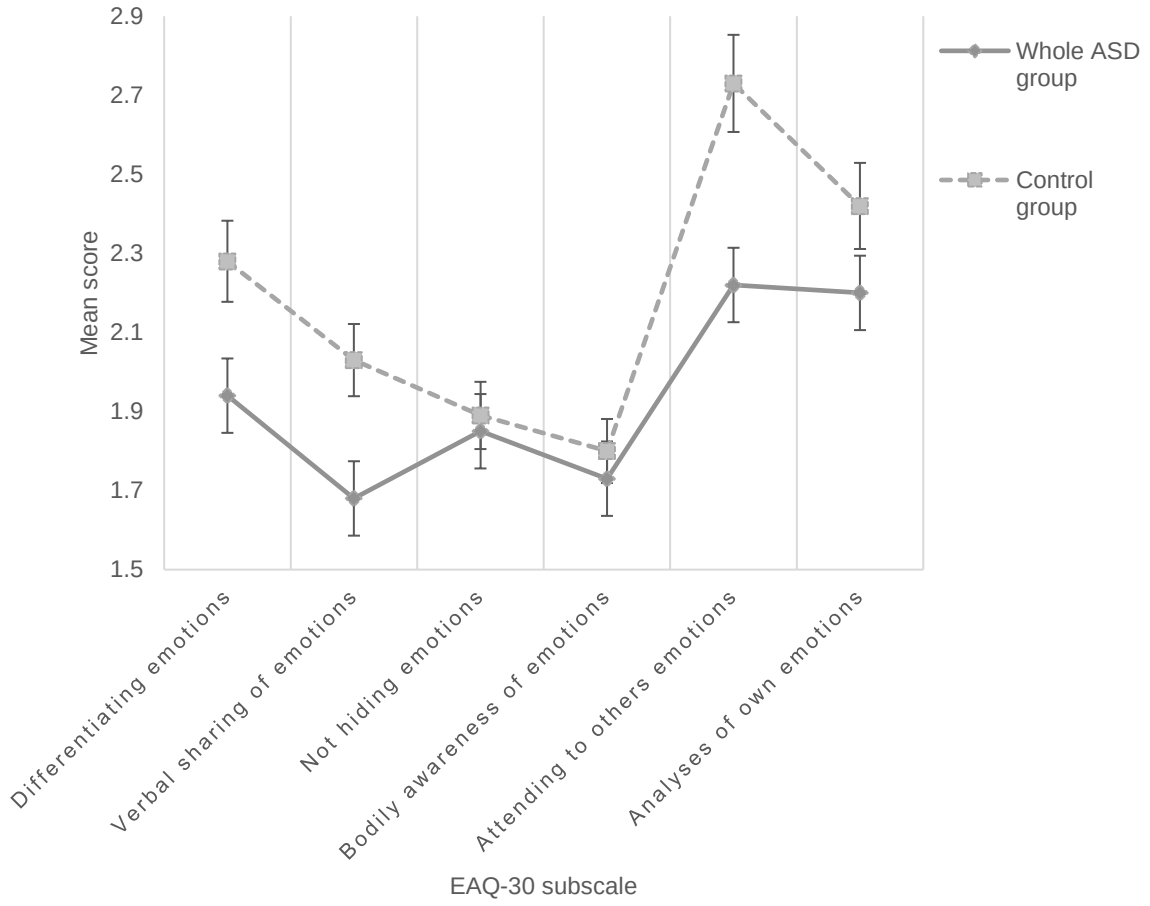

Figure 1. Interaction between group and the EAQ-30 subscales for the whole ASD group and the control group

Given the significant group x EAQ-30 interaction, simple main effects were analysed using univariate analyses. **SPSS Bonferroni adjusted p-values are quoted (i.e. the reported p-values have been multiplied by six).** Participants with ASD scored significantly lower on Differentiating Emotions, Verbal Sharing of Emotions, Attending to Others' Emotions, and

Analyses of Own Emotions. There were no significant differences between the groups for Not Hiding Emotions, or Bodily Awareness of Emotions (see Table 1).

Table 1

Mean scores and simple main effects of group for each subscale of the EAQ-30 for the control group and whole ASD group

	Mean Scores (SD)		**Simple main effects**
EAQ-30 scales	**Control group (n=56)**	**Whole ASD group (n=56)**	**Control vs ASD group**
Differentiating Emotions	2.28 (0.43)**	1.94 (0.56)	F (1, 109) = 12.97, *p* = .001
Verbal Sharing of Emotions	2.03 (0.61)**	1.68 (0.58)	*F* (1,109) = 9.64, *p* = .002
Not Hiding Emotions	1.89 (0.48)	1.85 (0.46)	*F* (1,109) = .16, *p* = .687
Bodily Awareness of Emotions	1.80 (0.51)	1.73 (0.49)	*F* (1,109) = .58, *p* = .447
Attending to Other's Emotions	2.73 (0.27)**	2.22 (0.57)	*F* (1,109) = 37.02, *p*= .001
Analyses of Own Emotions	2.42 (0.49)*	2.20 (0.49)	*F* (1,109) = 6.38, *p*= .013

Note. ASD = autism spectrum disorder; EAQ-30 = Emotion Awareness Questionnaire; *SD* = Standard Deviation;**p<0.01, *p<0.05, ***p*-values reported for each comparison have been adjusted for multiple comparisons using SPSS Bonferroni corrections (i.e. multiplied by six)**

Hypothesis 2: YP with ASD who have attended CBT for help with an emotional disorder will score lower on a task of emotion awareness than YP with ASD who have not been clinically referred for CBT for an emotional disorder

Within the ASD groups, a mixed ANCOVA examined the group x EAQ-30 interaction for the CBT group (n=33) and the no CBT group (n=23). Given that the assumption of sphericity was violated, $X^2(14)=31.13$, $p=.005$, and as estimates of sphericity are $\varepsilon>0.75$, Huynh-Feldt corrected values are reported. The main effect of the EAQ-30 subscales was not significant within-subjects, indicating that if group is ignored, average scores on the EAQ-30 were similar, $F(4.58,242.96)=0.57$, $p=.707$.

The covariate, age, did not significantly interact with the EAQ-30, suggesting that when group is not taken into consideration, scores on the EAQ-30 scales are not affected by age, $F(4.58,242.96)=0.78$, $p=.556$. The main effect of age between-subjects was also not significant, indicating that age was similar across groups, $F(1,53)=0.001$, $p=.970$.

There was a significant group x EAQ-30 interaction, showing that the scales are differently affected by group $F(4.58,242.96)=6.02$, $p=.001$. The main effect of group between-subjects was not significant, indicating that the scores from the groups were generally similar, $F(1,53)=1.46$, $p=.232$ (Figure 2).

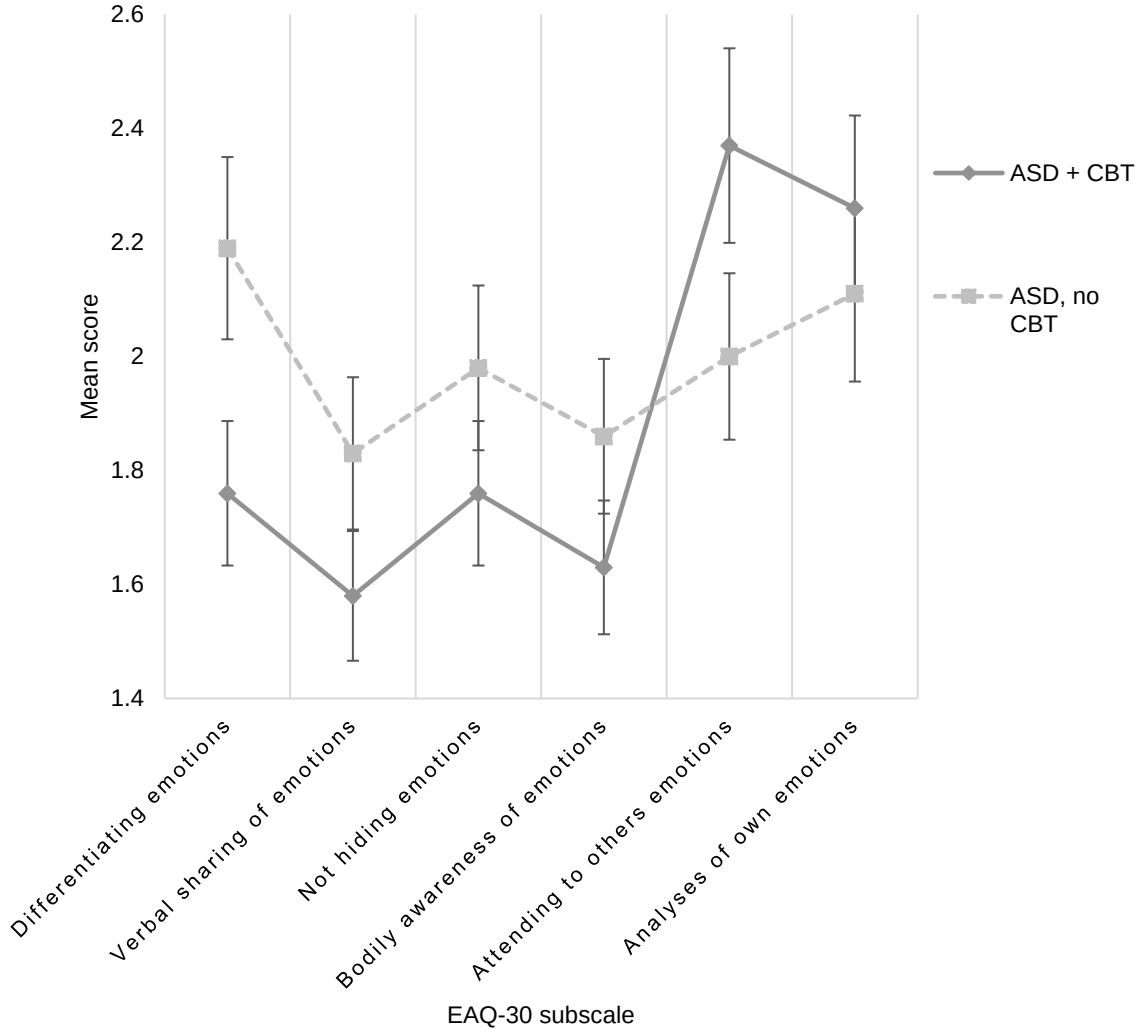

Figure 2. Interaction between group and the EAQ-30 subscales for the ASD + CBT group and ASD, no CBT group

Given the significant group x EAQ-30 crossover interaction, simple main effects were analysed using univariate analyses. **SPSS Bonferroni adjusted p-values are quoted (i.e. the reported p-values have been multiplied by six).** The CBT group scored significantly lower in their ability

to Differentiate Emotions and significantly higher on Attending to Other's Emotions. There were no significant differences between the groups for Verbal Sharing of Emotions, Analyses of Own Emotions, Not Hiding Emotions, or Bodily Awareness of Emotions (see Table 2).

Table 2

Mean scores and simple main effects of group for each subscale of the EAQ-30 for the CBT and no CBT groups

EAQ-30 scales	Mean Scores (SD)		Simple main effects
	ASD + CBT (n=33)	**ASD, no CBT (n=23)**	**CBT vs no CBT**
Differentiating Emotions	1.76 (0.48)**	2.19 (0.57)	$F(1, 53) = 9.97$, $p = .003$
Verbal Sharing of Emotions	1.58 (0.51)	1.83 (0.64)	$F(1, 53) = 2.42$, $p = .125$
Not Hiding Emotions	1.76 (0.43)	1.98 (0.48)	$F(1, 53) = 3.08$, $p = .085$
Bodily Awareness of Emotions	1.63 (0.42)	1.86 (0.57)	$F(1, 53) = 2.81$, $p = .099$
Attending to Other's Emotions	2.37 (0.44)*	2.00 (0.67)	$F(1, 53) = 6.21$, $p = .016$
Analyses of Own Emotions	2.26 (0.47)	2.11 (0.52)	$F(1, 53) = 1.24$, $p = .270$

Note. ASD = autism spectrum disorder; EAQ-30 = Emotion Awareness Questionnaire; *SD* = Standard Deviation; **$p<0.01$, *$p<0.05$, ***p*-values reported for each comparison have been adjusted for multiple comparisons using SPSS Bonferroni corrections (i.e. multiplied by six)**

Discussion

This research aimed to consider the prerequisite skills for CBT for YP with ASD through an emotion awareness measure by comparing YP with and without ASD, as well as considering

differences within the ASD group in terms of comorbid emotional problems. It was hypothesised that: 1) YP with ASD would score lower on a task of emotion awareness than typically developing YP, and 2) YP with ASD who have attended CBT for help with an emotional disorder would score lower on a task of emotion awareness than YP with ASD who have not been clinically referred for CBT for an emotional disorder.

In line with initial hypotheses, participants with ASD scored significantly lower than typically developing participants on several domains of emotion awareness: Differentiating Emotions, Verbal Sharing of Emotions, Attending to Others' Emotions, and Analyses of Own Emotions. There were no significant differences between the groups for Not Hiding Emotions, or Bodily Awareness of Emotions. This finding is similar to previous research showing that children with ASD (mean age 11 year 5 months) have greater difficulty than typically developing YP in identifying and differentiating between their emotions (Rieffe et al., 2007). The current study also extends this finding to older adolescents (mean age 15 years 7 months). However the lack of difference between the groups in bodily awareness of emotions is in contrast to a previous study in this area (Rieffe et al., 2008).

Age could play an important role in these differences; research suggests that recognition of others' emotions is significantly related to age for YP with ASD, but not for typically developing YP (Lickel et al., 2012). Typically developing adolescents experience an increase in complex emotion regulation which is influenced by social context (Zeman et al., 2006).

In the present study, the YP with ASD who had attended CBT scored significantly lower on the Differentiating Emotions and higher on the Attending to Others' Emotions sub-scales than the YP

with ASD who had not attended CBT. Although current anxiety and depression were not directly measured, it is plausible that the referral to services for CBT serves as a useful indicator of increased emotional difficulties. Thus it can be hypothesised that differentiating between emotions may contribute to the development or maintenance of problematic emotional responses, such as anxiety disorders and depression, precipitating CAMHS referrals. Previous research with a non-clinical group of children with ASD suggested that difficulties differentiating between emotions, communicating them, and identifying their causes is related to increased internalizing disorders such as anxiety and depression (Rieffe et al., 2006; Rieffe et al., 2008; Rieffe et al., 2010). In order to better understand this finding, further research measuring emotion awareness, anxiety and depression both pre and post CBT, and with those who had not attended CBT, would be beneficial. In terms of Attending to Others' emotions, it is possible that YP with ASD who have attended CBT are focussing on how other people are feeling at the expense of their own internal state. This is similar to findings with adults with ASD, who focus more on external events than on inner experiences (Hill et al., 2004).

Limitations and Future Research

There are a number of limitations to this research which need to be taken into account when considering the generalizability of the findings. These include the fact that this study did not use standardized or manualized CBT, it did not measure or control for cognitive ability, ASD diagnostic assessment was non-standardised, and the use of the EAQ-30 above recommended age norms, the time this was administered, and lack of pre-post measures of outcome. Each of these is addressed in turn with recommendations for future research.

Firstly, other factors that may be important in therapeutic outcome were not measured or controlled for in this study, including symptom severity, concurrent medication, number of CBT sessions, therapeutic alliance and therapist factors (Messer and Wampold, 2002). **It is recommended that future research using a more standardized CBT approach would be beneficial.**

Successful completion of CBT tasks has also been associated with cognitive ability and age (Quakely et al., 2003; Quakely et al., 2004; Doherr et al., 2005). Measuring cognitive ability was beyond the scope of the current research, however it is important for future research to **measure and control for this**. Additionally, ASD diagnoses were made by local paediatric or CAMHS teams, and verified by schools and parents within the community sample. Thus a non-standardised approach to diagnostic assessment may be pertinent to this research, with some clinics using standardised assessment tools while diagnosis in others may have been based on clinical impression. Future research should aim to include a standardised diagnostic assessment.

Additionally, the measure was administered post- treatment, and compared to a community sample which may have influenced the results, for example the CBT sample had comorbid axis 1 diagnoses. Future research examining emotion awareness pre- to post-CBT would be useful to get a better understanding of the relationship between emotion awareness and outcome in CBT. Using an independent assessment of treatment outcome, completed by the YP and their parent would also be of value.

In terms of the sample itself, CAMHS clinicians were asked to identify YP who had attended CBT. It is possible that they may have been biased in their selection and chose YP who they thought

responded well to therapy, or with whom they were doing 'proper' CBT. Participants then needed to make initial contact with the researcher, meaning that they would need to be motivated to engage in the research and therefore possibly more likely to have been engaged in CBT.

Finally, in respect of measures, the EAQ-30 was developed for YP aged 9-16 years old (Rieffe et al., 2008; Rieffe et al., 2011). It was used with YP up to the age of 20 years old in this research, and therefore requires careful interpretation. There has also been some criticism of the use of self-report questionnaires for YP; however, evidence also suggests that YP are actually better at identifying their own internalising symptoms than informants (e.g. parents or teachers) (Achenbach et al., 1987; DiBartolo and Grills, 2006; Jellesma et al., 2007).

Clinical Implications and Conclusion

Given the high prevalence rates of anxiety disorders and depression for YP with ASD, and the recommendations for specific adaptations, a greater understanding of the precise needs underpinning these adaptations is warranted. This is the first research study to examine the internal emotion awareness in YP aged 11-18 with a diagnosis of ASD. This research highlights the importance of clinicians tailoring CBT to the needs of individuals with ASD. In particular, it demonstrates how it is vital for clinicians to teach YP with ASD about differentiating between and understanding the antecedents to their own feelings and emotions. It also shows the complexities of research within this area, and the need for larger research studies to build our understanding of the mechanisms behind CBT.

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