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Psychiatric problems of Chinese college students with high autism traits

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ABSTRACT

Recent research has documented increased psychiatric problems in individuals who report elevated traits of autism spectrum disorder (ASD). However, most of the studies are conducted in Western countries, and suicidal behaviors in particular are scarcely examined in this population. The objective of the current study was to examine the prevalence of Chinese college students who surpassed a clinical cutoff for ASD, the correlations between ASD traits and psychiatric problems (i.e., depression, anxiety, obsessive-compulsive disorder [OCD], suicidal behaviors), and factors that possibly mediated the relations between ASD traits and suicidal behaviors. Results indicated that 1.50% of individuals in the sample surpassed the clinical cutoff score for ASD. Among this group who surpassed the clinical cutoff for ASD, severity of OCD symptoms was the highest among the measured psychiatric problems. ASD traits were significantly positively correlated with depression, anxiety, suicide ideation and plans, as well as OCD and its six dimensions (i.e., ordering, washing, hoarding, checking, obsession, and neutralizing). After controlling other psychiatric indicators, however, partial correlation analysis indicated that associations between ASD traits and suicide behaviors were no longer significant. Though, depression symptoms were found to mediate the link between the ASD traits and suicide ideation (for females and males) and suicide plans (for males only). Overall, these results provide a deeper insight into the characteristics of ASD traits, as well as the relationship between ASD traits and co-occurring psychiatric symptoms in a non-Western sample of Chinese college students.

1. Introduction

Autism spectrum disorder (ASD) is a neurodevelopmental disorder characterized by impairments in social communication and restricted interests and/or repetitive behaviors (American Psychiatric Association, 2013). According to previous research, individuals in the general population vary along a dimension of ASD traits, extending from minimal ASD characteristics to severe presentations (Baron-Cohen, Wheelwright, Skinner, Martin, & Clubley, 2001). This suggests that the general population also exhibits various levels of ASD traits, even if such individuals do not necessarily meet criteria for a clinical diagnosis. For example, researchers found 3.3% of university students experienced clinically significant levels of ASD traits in their research (Freeth, Bullock, & Milne, 2013). A growing number of studies have focused exclusively on individuals who are undiagnosed and non-treatment-seeking but nonetheless present with high ASD traits (a group hereafter referred to as those with *high ASD traits* for ease of communication). Research on individuals with high ASD traits is carried out in the service of understanding correlates of and core mechanisms underlying the nature of ASD, as

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studying this clinical phenomena in severe cases and individuals with classic manifestations of ASD is quite challenging given that some severe cases with ASD are accompanied by concomitant intellectual disability and low levels of verbal language (Matson & Shoemaker, 2009; Rapin & Dunn, 2003; Sharda, Khundrakpam, Evans, & Singh, 2016).

Psychiatric comorbidity in ASD has been relatively understudied, although it is extremely important to recognize comorbid diagnoses in individuals with ASD for therapeutic aims (Mannion, Leader, & Healy, 2013; Matson & Nebel-Schwalm, 2007). Some research indicates that individuals with ASD present with increased psychiatric problems, such as depression, anxiety, and obsessive-compulsive disorder (OCD) (Cath, Ran, Smit, Van Balkom, & Comijs, 2008; Ghaziuddin, Ghaziuddin, & Greden, 2002; Hammond & Hoffman, 2014; Ruta, Mugno, D'Arrigo, Vitiello, & Mazzone, 2010). For example, researchers found that 11%–84% children with ASD had a comorbid diagnosis of an anxiety disorder (White, Oswald, Ollendick, & Scahill, 2009), and nearly 34% had depression (Kim, Szatmari, Bryson, Streiner, & Wilson, 2000). Nonetheless, symptoms of anxiety, depression, and OCD are not unique to clinical ASD samples. Individuals with high ASD traits may experience similar deficits as those exhibited by clinical ASD samples, for example, maladjustment with changes of environments (Hoekstra, Bartels, Hudziak, Van Beijsterveldt, & Boomsma, 2007), a lack of empathy (Wright & Skagerberg, 2012), and a deficit in social problem-solving ability (Rosbrook & Whittingham, 2010). These deficiencies could lead to difficulties in daily life and lead to mood problems, such as anxiety and depression (Freeth et al., 2013; Kanne, Christ, & Reiersen, 2009; Kunihiro, Senju, Dairoku, Wakabayashi, & Hasegawa, 2006; Rosbrook & Whittingham, 2010). Individuals with high ASD traits may also present with elevated obsessive-compulsive symptoms, e.g., low novelty seeking, high harm avoidance, and low reward dependence (Kunihiro et al., 2006), just as individuals with clinically diagnosed ASD (Russell, Mataix-Cols, Anson, & Murphy, 2005; Ruta et al., 2010).

Up to now, most published studies examining the increased psychiatric problems in individuals with high ASD traits have been carried out with participants in Western countries (United States [e.g., Kanne et al., 2009; Mayes, Gorman, Hillwig-Garcia, & Syed, 2013], England [e.g., Hallett, Ronald, & Happé, 2009]). Few studies have examined the comorbidity and correlates of clinically relevant ASD in Eastern countries (Kunihiro et al., 2006), especially in China. Confirming the universality of the associations between high ASD traits and psychiatric problems would be useful for advancing the essentialist (versus social constructivist) notion of ASD phenomena. Although biological markers of ASD have been advanced (Blatt & Fatemi, 2011; Guo, Wang, Liu, Chen, & Yang, 2013; Wang et al., 2016), suggesting an essentialist nature, it remains unclear if phenotypic expression of ASD traits and correlates (e.g., depression, anxiety, OCD, suicide behavior) are similar in Eastern countries. Differences in expression would suggest some levels of contextual influence for ASD traits and correlates, whereas similarities in expression in China (i.e., in non-Western versus Western countries) would support the universality of the ASD phenotype and its sequelae.

The present study also explored the associations between ASD traits and suicidal behaviors. Suicide is a serious public health issue, and it is the second leading cause of death among college students (Turner, Leno, & Keller, 2013) and the first leading cause of death among Chinese people aged 15–34 years (Phillips, Li, & Zhang, 2002). Research on individuals with ASD in the West has found an increased risk of suicide ideation and attempts (Kato et al., 2013; Mayes et al., 2013). In the present study, we referred to the definition of suicidal behaviors proposed by Nock et al. (2008), classifying suicidal behaviors into *suicide ideation*, *suicide plans* and *suicide attempts* and examined the correlates between ASD traits and suicidal behaviors in a Chinese college student sample. According to previous research (Hannon & Taylor, 2013), comorbid psychiatric disorders (e.g., mood disorder, anxiety disorder, and major depression disorder) might explain the suicidal behaviors among ASD patients. Some researchers propose that depression might be the strongest single predictor of suicide ideation or attempts in children with ASD (Mayes et al., 2013). Based on the above studies, we hypothesized that psychiatric symptoms, especially depression, mediated the link between ASD traits and suicidal behaviors in a non-clinical sample. Considering the difference in ASD traits between females and males (Baron-Cohen & Hammer, 1997; Baron-Cohen, Wheelwright, Stone, & Rutherford, 1999, 2001), it is also important to consider potential gender differences in the relationship between ASD traits and psychiatric problems. Ultimately, the current study aimed to contribute to this area of research on psychiatric distress, including suicidality, in the population of adults with high ASD traits. Further advances in this area, particularly for suicidality, could be boon to public health, as such research could stimulate awareness, tools, and interventions targeting this group.

2. Methods

2.1. Participants

A total of 2780 undergraduate students at two universities in Shandong and Shanxi provinces in China were recruited in classrooms to fill out a series of questionnaires. Of them, 2608 adult students (1339 men, 1236 women, 33 unknown) completed the questionnaires (with missing values of less than 10%). Students were recruited from the fields of humanity (literature and law; $n = 279$), social science (economics, education, and management; $n = 113$), nature and applied science (science, engineering, $n = 548$), and medicine ($n = 1554$). The participants' mean age was 20.57 years old ($SD = 1.17$; range: 18–30 years old).

2.2. Instruments

Autism Spectrum Quotient: The self-report questionnaire consists of 50 items, each with a 4-point rating scale. The scale includes 10 items for each of five subscales, including Social Skill, Attention Switching, Attention to Detail, Communication, and Imagination (Baron-Cohen et al., 2001). Responses consistent with ASD receive one point, while responses inconsistent with ASD receive zero points, with total scores ranging from 0 to 50. The Chinese version of AQ has demonstrated adequate validity and reliability (Lau

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