ARTICLE

A PILOT EXPLORATION OF THE RELATIONSHIP BETWEEN TEMPERAMENT AND PSYCHOPATHOLOGY IN 12–18 YEAR-OLD CHILDREN BORN AT EXTREMELY LOW BIRTH WEIGHT

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ABSTRACT

This pilot study was aimed at exploring the temperament and psychopathology distribution amongst adolescents born at extremely low birth weight (ELBW), i.e. < 1000g. ELBW adolescents (*N* = 15) completed the Revised Cheek and Buss Scale and Mini International Neuropsychiatric Interview 5.0.0 (M.I.N.I.), while their legal guardians completed a biographical questionnaire. The median age of the sample was 13 *SD* = 2.526 years (60% male) and all participants spoke English. The results suggest that being born at ELBW is associated with shyness in adolescence. Anxieties, mood and hyperactivity symptoms were prevalent. Planning of interventions for ELBW individuals should therefore include strategies to prevent or mitigate the effects of these factors in adolescence.

Keywords: Extremely low birth weight, Mini International Neuropsychiatric Interview, Psychopathology, Revised Cheek and Buss Scale, Shyness, Social phobia, Temperament

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The purpose of this study was to explore the relationship between temperament and psychopathology in extremely low birth weight (ELBW) adolescents. ELBW is a concept used to describe infants born weighing less than 1000 g (Kaul, 2007). According to the World Health Organization (2011), in more than 100 developing countries, including South Africa, LBW rates are estimated to be around 10% (World Health Organization, 2013). Unfortunately, prevalence estimates are less clear for ELBW infants.

In the last four decades there have been significant advances in perinatal and neonatal intensive care, including mechanical support through ventilation, antenatal corticosteroids and surfactant treatment (Strang-Karlsson, 2011) – resulting in increased survival rates of ELBW infants in countries such as the United States of America, Canada and Finland (Doyle, 2006; Flink, Beirens, Looman, Landgraf, Tiemeier, Mol, Raat, 2013; Tommiska, Heinonen, Ikonen, Kero, Pokela, Renlund, Fellman, 2001). A similar pattern of improved mortality is noted in South Africa (Bassler, Stoll, Schmidt, Asztalos, Roberts, Robertson, & Sauve, 2009, Lorenz, 2001, Velaphi, Mokhachane, Mphahlele, Beckh-Arnold, Kuwanda & Cooper, 2005). The decreased mortality rates leave developmental researchers with questions around the long-term effects of being born at ELBW.

There is a significant amount of research reporting on the immediate biological effects of ELBW – such as cerebral palsy (CP), intellectual disability disorder (IDD), developmental delays, and other neurocognitive impairments (Bassler, Stoll, Schmidt, Asztalos, Roberts, Robertson, & Sauve, 2009; Doyle, 2006; Kaul, 2007; Saigal, Stoskopf, Boyle, Paneth, Pinelli, Streiner & Goddeeris, 2007; Vohr, Wright, Dusick, Mele, Verter, Steichen, Simon, Wilson, Broyles, Bauer, Delaney-Black, Yolton, & Fleisher, 2000). In contrast, research focusing on the long-term effects of ELBW is relatively scarce. Researchers do suggest that ELBW survivors were at high risk for developing poor physical and mental health in the long-term (Boyle, Miskovic, Van Lieshout, Duncan, Schmidt, Hoult & Saigal, 2011, Cooke, 1996, Doyle, 2006). In particular, ELBW survivors are seen to be at risk of developing internalising disorders such as anxiety and social withdrawal, as well as externalising problems such as poor attention and concentration, anxiety and mood problems (Brazier, Harper, Jones, Cathain, Thomas, Usherwood, & Westlake 1992; Cooke, 1996; Msall & Park, 2008; Olivieri Bova, Urgesi, Ariaudo, Perotto, Fazzi & Orcesi, 2012; Pistorius, 2011).

Even ELBW infants born without major physical impairments may exhibit specific temperament patterns – higher levels of cautiousness, shyness, risk aversion and less extraversion – in adolescence than their normal birth weight (NBW) peers (Boyle, Schmidt, Miskovic, & Saigal, 2008) that may predispose the ELBW child to decreased social engagement and an increased chance of experiencing loneliness and lowered emotional well-being, thereby placing this child at risk for psychological problems (Schmidt, Miskovic, Boyle, & Saigal, 2008).

The focus of this study was on the long-term effects of ELBW, with an emphasis on the relationship between temperament and psychopathology in ELBW adolescents. The

aim of this study was to explore the relationship between temperament and psychological disorders in ELBW adolescents.

METHOD

This was a quantitative study with a non-experimental and cross-sectional correlation design.

Ethics clearance for the original study was obtained from the University of South Africa's Department of Psychology. Requests for access to patients' files were submitted to eight public and five private hospitals; however, permission was only granted by one public hospital. Individuals were also identified through advertisements on social media. Details of the study with contact numbers were posted on the following Facebook pages: "Support for moms with preemie babies" and on Dannita Borrageiro's personal Facebook page.

The interviews were conducted by Dannita Borrageiro, who was a Master's student in clinical psychology at the time. As the participants were all under specialist care at the time of the interviews, no additional counselling was offered. However, upon terminating the interview process, the interviewer's contact details were shared with the participants. Participants were informed that the results of the study would be reported back to them through informal feedback, a face-to-face feedback session or email, depending on the availability of the participants and their personal preferences.

Adolescents born at a weight of less than 1000 g were invited to be part of this study; only those adolescents older than 12 years and younger than 17 years and 11 months at the first meeting were included in the study. Of the 25 individuals invited to participate in the study, 15 agreed to participate. The legal guardians of adolescents weighing less than 1000 g at birth, born between 1996 and 2002, were approached to participate in the study. Informed consent was obtained from the guardians (all of whom were the biological parents of the adolescents) and assent was requested from the adolescents.

The birth weights of participants were confirmed by recording the participant details from their hospital file or, alternatively, if they were contacted through social media – this was confirmed by the parent. Data were generated through the completion of three questionnaires. All three questionnaires were completed on the same day. One parent per adolescent was asked to complete the biographical questionnaire, which consisted of questions about parent and child demographics, birth weight, medical and psychological history and current difficulties observed by the parents, such as trouble concentrating. The ELBW adolescents were asked to complete the RCBS and M.I.N.I with the aid of the assessor. Due to physical handicap (CP-related impairments) three parents were required to fill out all questionnaires on behalf of their ELBW adolescents.

The M.I.N.I is a structured interview questionnaire developed by Sheehan and colleagues in 1992. The questionnaire consists of 120 items with yes/no responses. It

is used to diagnose 17 Axis I disorders (major depression, dysthymia, mania, panic disorder, agoraphobia, social phobia, generalised anxiety disorder, obsessive compulsive disorder, psychosis, alcohol abuse, alcohol dependence, drug abuse, drug dependence, anorexia, bulimia, post-traumatic stress) (Sheehan et al., 2010). The disorders are classified according to the Diagnostic and Statistical Manual of Mental Disorder (DSM)-IV-TR), (American Psychiatric Association, 2013; Mula et al., 2009). The M.I.N.I has been translated into a number of languages. The English version and translations show sound psychometric properties (Amorim, Lecrubier, Weillerl, Hergueta, & Sheehan, 1998; Cohen, Vardy, Weiner, Shvartzman, & Aviv, 2005) with a Cronbach's alpha coefficient of 0.78, indicating good reliability for a screening instrument (Bunevicus, Peceliuniene, Mickuviene, Valius & Bunevicius, 2007). Though not validated in South African samples, the M.I.N.I. has been used in a number of cross-cultural studies (Myer et al., 2008). The M.I.N.I. has also been used in at least two studies on HIV/AIDS samples in South Africa (Olley, Seedat, Nei, & Stein, 2004; Olley, Zeier, Seedat, & Stein, 2005).

The RCBS was developed by Cheek and Buss in 1983. It is a 13-item measure that is based on the original 9-item measure of shyness and sociability developed in 1981. It is designed to measure shyness and sociability. Items are rated on a Likert scale from 0–5 (Hopko, Stowell, Jones, Armento, & Cheek, 2005). In brief, sociability "is a preference for affiliation or need to be with people", and shyness is "the discomfort and inhibition that may occur in the presence of others" (Cheek & Buss, 1981, p. 330). The total scores on the RCBS range from 13 to 65. Cheek and Buss (1983) propose that individuals scoring over 49 should be considered very shy, those with scores over 39 should be considered shy, and individuals scoring below 39 should be recognised as non-shy or sociable. According to research by Hopko et al. (2005), the RCBS has high validity and reliability scores, with strong internal consistency ($\alpha = .79$) (Cheek & Buss, 1981), an excellent 45-day, test-retest reliability and correlation with the original 9-item version (Hopko et al., 2005).

Data analysis strategies

Data were captured in an Excel spread sheet and transferred to SPSS 22. Given the small sample ($N = 15$) the median and not the mean values are focused on in the descriptive statistics. Correlation analysis was conducted using the non-parametric Kendall-tau-b statistic, which is suitable for small samples (Field, 2000). Guidelines from Cohen and Cohen (1983) where used in the discussion of strength of correlation: when $r = .1$ to .3, it indicates a small effect; if $r = .3$ to .5, it indicates a moderate effect; while an $r > .5$ indicates a large effect. The Fisher's Exact test was used for comparing M.I.N.I results (categorical data) across various groups (Field, 2000). The level of significance was set at $p < .05$ for all calculations.

RESULTS

The gender distribution was slightly biased towards male children (n = 9; 60%). The median age in years was 13 SD = 2.526. The race of the sample was biased towards Caucasians (n = 10; 67%), while three adolescents (20%) were coloured and two (13.3%) were Indian. All participants spoke English as a first or second language, while nine participants (60%) also spoke Afrikaans and two (13.3%) were exposed to a third language. All participants had attended some form of schooling: Three (20%) of the sample attend a school for special-needs children, while one (6.7%) has a Grade 4 level of education, two (13.3%) attained a Grade 5 level of education, one (6.7%) attained a Grade 6 level of education and three (20%) had completed Grade 7. All ELBW adolescents attending a mainstream school had attained the appropriate number of years of education in relation to their ages.

Birth

Nine (60%) of the sample were born in a private hospital, whereas six (40%) were born in public hospitals. Currently, eleven (73.3%) of the sample have medical aid and make use of private hospital services, whereas four (26.7%) of the sample do not have medical aid. Parents reported that ten participants (66.7%) in the sample were born between 25 and 30 weeks and five participants (33%) in the sample were born between 30 and 35 weeks, requiring them to be admitted into NICU in their respective hospitals. Parents were also asked to report on the weight at which their child were born: Four (26.7%) of the sample weighed 701–800 g at birth, six (40%) 801–900 g and five (33.3%) of the sample 901–1000 g.

Psychological problems

According to the M.I.N.I. one (6.7%) of the respondents met the full diagnostic criteria for bipolar mood disorder current episode manic, while 40% of the adolescents reported symptoms of mania that did not meet the criteria for a manic episode. Six (40%) participants reported symptoms of social anxiety that met the criteria for social phobia disorder. One (6.7%) participant met the criteria for generalised anxiety disorder.

Two children (13.3%) were reported to be hyperactive by their parents. Parents also reported that nine (60%) of the children experience concentration problems on a daily basis, while three (20%) adolescents had previously been diagnosed with attention deficit hyperactivity disorder (ADHD) and two (13.3%) had been diagnosed with intellectual and developmental disability (IDD).

Temperament

The scores on the RCBS range from 13 to 65. The median score was 41, *SD* = 2.71. A cut-off score of 39 was used for this study to differentiate the shy from the sociable individual (Hopko et al., 2005). Four adolescents (26.7%) were classified as sociable and eleven (73.4%) were classified as somewhat shy. There were no participants that were classified as very shy.

Correlations

Correlation was explored between the following variables to answer the temperament-psychopathology research question: RCBS score; whether or not the caregivers perceived a concentration problem; how often the adolescent was perceived as having concentration difficulties; family history of psychological problems; the three M.I.N.I categories that were represented (i.e. bipolar disorder with most recent episode manic, GAD and social phobia) and whether or not the adolescent has a previously diagnosed psychological disorder. There are strong negative correlations between: The previous diagnosis of a childhood psychological disorder in the adolescent and social phobia (r = {U+2212}.667, p = .013) and the diagnosis of a childhood psychological disorder in the adolescent and shyness (r = {U+2212}.594, p = .011).

Comparisons across groups

The comparisons across groups helped provide further understanding of the relationship between temperament and psychopathology in adolescents born at ELBW. Using Fisher's Exact Test, comparisons were conducted for three positive M.I.N.I categories that were represented (i.e. manic episode, GAD and social phobia) across the following groups: gender, race, type of hospital in which the adolescent was born, employment status of the primary caregiver, whether or not the family has medical aid, gestational age, birth weight category, whether or not the adolescent has a concentration problem, family history of physical illness, family history of psychological disorders, and whether or not the adolescent has been diagnosed with a psychological disorder.

The RCBS scores were significantly higher in adolescents with a diagnosed psychiatric disorder (p = .007) than for those without. This means that there is a significantly higher degree of shyness in ELBW adolescents with a psychological disorder than those without. RCBS scores were significantly higher amongst those with than amongst those without social phobia (p = .041).

DISCUSSION

The longer-term effects of being born at ELBW are largely unexplored in the literature. In South Africa in particular, there has been scant relevant research in the field. International

studies show that ELBW infants are found to have a more shy/risk-aversive temperament compared to their peers, which puts them at risk of developing avoidant interactional styles and psychological disorders such as anxiety (Schmidt, Miskovic, Boyle, & Saigal, 2008). Socio-economic status, parental support and involvement relating to intellectual stimulation and development, and the development of a psychological disorder and temperament – all contribute to quality of life in the ELBW adolescent (Zwicker & Harris, 2008). Globally, an estimated 15.5 % of babies are born at LBW, but more than 90% of those babies are born in developing countries (Wielligh, 2012) – indicating a large percent of ELBW infants born to families of low socio-economic status. Associated with low socio-economic status is poor nutrition, unavailability of parents due to intense labour and low wages, and minimal time for intellectual stimulation of children – thus impacting on their prognosis negatively (Elgen & Sommerfelt, 2002; Indredavik et al., 2004; Saigal et al., 2007).

The current study was a pilot investigation involving only 15 ELBW children. The results are to be interpreted with caution given the small sample size. Most participants were born in private hospitals in South Africa at a gestational age between 25 and 30 weeks (i.e. very preterm), and weighing 701–800 g. The closer infants are born to full-term (30–40 weeks), the better the prognosis of the outcome of the ELBW infant – due to the development of the infant's lung capacity and organs (Lorenz, 2001). Birth weight has also been found to be an important indicator of health status and better quality of life later on. The lower the birth weight, the more health problems are experienced immediately after birth through to later in life (Matsuo, 2003). For example, Hack et al. (1994) conducted a comparative study of ELBW adolescents with birth weights under 750 g and those weighing 750–1499 g. They found that adolescents weighing less than 750 g at birth had more cognitive impairments, difficulty with academic functioning, and poorer psychomotor/social skills and adaptive functioning and behaviour than adolescents who were born weighing more than 750 g. The results of the current pilot study indicate a poor prognosis for the majority of the participants.

Recent research indicates that infants born in private hospitals have an increased chance of survival in South Africa, in comparison to those born in public hospitals. This is attributed to the availability of hospital resources such mechanical ventilators, surfactant steroid therapy and medical technology (Cooper & Sandler, 1997; Mokhachane, Saloojee, & Cooper, 2006; Partridge et al., 2005). The majority of the subjects in this study (n = 9; 60%) were born in a private hospital. In addition, the majority of parents were employed (n = 11; 73.3%) and educated to high school or tertiary level (n = 10; 66.6%). This may have led to better outcomes for this sample than may otherwise be expected in developing country contexts and should be taken into account when generalising findings.

The occurence of psychopathology amongst ELBW adolescents

ELBW individuals are at higher risk of developing psychological problems – such as poor attention and concentration, learning disorders, psychomotor impairment, shyness and social phobia – in comparison to their peers (Cooke, 1996; Olivieri et al., 2012; Pistorius, 2011). In the current study, 40% of the respondents reported symptoms of social anxiety that met the criteria of social phobia disorder, 6.7% for bipolar mood disorder 1, most recent episode manic, and 6.7% for GAD – according to the M.I.N.I criteria. Interestingly, 40% of ELBW adolescents reported symptoms of mania in bipolar mood disorder that did not meet the criteria for a manic episode. Reports by parents indicated that 40% of the adolescents were previously diagnosed with ADHD. Again, though the results indicate a high incidence of psychopathology, they are interpreted cautiously because of the small sample.

Anxiety disorders

ELBW are the smallest and most at-risk infants that are exposed to pre- and post-natal risks. ELBW adolescents experience psychological problems such as anxiety – due to the interactions of genetic predisposition, low self-esteem, shyness and poor socialising ability (Indredavik et al., 2004; Ristvedt & Trinkaus, 2009; Saigal, et al., 2003). ELBW is found to be associated with internalising problems related to anxiety, such as social phobia and GAD (Strang-Karlsson, 2011). Social phobia is described as an intense fear of social situations, where one fears being watched or judged – and the situations may be so anxiety provoking as to force one to try and avoid them (Carducci et al., 2001; Schmidt & Fox, 1995; Schwartz et al., 1999). Six of the fifteen individuals (40%) of the current sample reported symptoms of social phobia that met the criteria for social phobia disorder. One (6.7%) participant met the criteria for GAD. This is similar to the report that 8–10% of ELBW adolescents suffer from some form of anxiety disorder or the symptoms thereof (Carducci et al., 2001; Indredavik et al., 2004).

Bipolar Mood disorder

One (6.7%) of the adolescents met the criteria for bipolar mood disorder 1, most recent episode manic. This individual was also previously diagnosed with bipolar 1 disorder, most recent episode manic – by a mental health practitioner. Although research has reported ELBW adolescents exhibiting inhibition and affective-related disorders in the anxiety cluster, there is a small amount of research reporting on disinhibited symptomatic behaviour related to affective disorders such as bipolar mood disorder (Claas et al., 2011; De Pauw & Mervielde, 2010). Hillegers et al. (2003) found that birth weight is associated with mood disorders, such as major depressive disorder and bipolar mood disorder, as well as non-mood disorders. However, there is also a significant amount of research that has assessed for bipolar mood disorder in ELBW adolescents, and which

has not found any significant correlation between the two variables (Hillegers et al., 2003; Strang-Karlsson, 2011).

When evaluating for mood disorders such as bipolar mood disorder, Hillegers et al. (2003) and Nomura et al. (2007) recommend that one must consider the association of familial loading of mood and substance-use disorder with mood- and non-mood disorders in bipolar offspring. Research by Hillegers et al. (2003) indicates that bipolar mood disorder is found in ELBW adolescents with a family history of psychopathology such as depression and bipolar mood disorder, and it is not highly prevalent in ELBW adolescents without this additional variable contributing to the genetic loading (biological affects) of developing bipolar mood disorder. To date, no direct link between bipolar mood disorder and ELBW adolescents has been found (Strang-Karlsson, 2011).

Attention Deficit Hyperactivity Disorder

ADHD was not a category investigated on the M.I.N.I and therefore none of the subjects could be classified using this questionnaire. However, the biographical questionnaire did make provision for parents to report any observed difficulties experienced by their child and to indicate previous / current diagnoses. Parents of three (20%) adolescents reported that their children had previously been diagnosed with ADHD and 60% of parents reported that their children experience concentration problems on a daily basis. The severity of the loss of concentration varied from once a week, to five times a week. In particular, parents stated that their children struggled to concentrate on multiple tasks.

There is an increasing amount of literature on the prevalence of inattention problems in ELBW adolescents (Boyle et al., 2011; Claas et al., 2011; Olivieri et al., 2012; Saigal., 2003). ELBW children have attention regulation, concentration and social difficulties – and parents report symptoms of ADHD (Boyle et al., 2011; Lahey, 2004; Saigal et al., 2003). However, the co-occurrence of the symptoms is often insufficient to meet the DSM criteria for ADHD. One possible explanation provided by Saigal, Ouden, et al. (2003) and Strang-Karlsson (2011) is a discrepancy between parent and child reporting of ADHD symptoms. Parents are overly concerned about their preterm babies as they mature into adolescents and over-report symptoms, or, conversely, the ELBW adolescents under-report symptoms due to misunderstanding or denial (Saigal, et al., 2003).

An important point to consider in the current study is that some symptoms of bipolar mood disorder – as assessed on the M.I.N.I – might have been better explained by the diagnosis and symptoms of ADHD (Geller et al., 2002; Sachs, 2000). Symptoms such as irritability, difficulty concentrating, increased energy levels, and behaviour problems were reported, but Geller et al. (2002) noted that irritability, hyperactivity, accelerated speech, and distractibility are frequent symptoms in both bipolar and ADHD, and it is therefore difficult to differentiate between these two diagnoses. Rather, symptoms must be looked at in relation to the environment and additional affective states. When

parents were asked in what ways their children were different to their peers, they reported symptoms of hyperactivity, being easily distracted, and jumping from one task to the next. The prevalence of mania-related symptoms, together with the findings of concentration problems reported in this study, may therefore indicate a high prevalence of ADHD amongst ELBW adolescents.

Intellectual and Developmental Disability

Research by Vohr and Garcia-Coll (1985) indicates that parents and teachers report that ELBW adolescents experience more cognitive deficits related to IDD than their peers (Ho, 1995; Neubauer et al., 2008; Reichman, 2005; Vohr & Garcia-Coll, 1985; Whitfield, Grunau, & Holsti, 1997). At school age, ELBW are more than nine times more likely than full-term controls to have an IQ below 70, which is the indicator for possible IDD (Tekolste et al., 2004). Parents reported that two (13.3%) subjects had been diagnosed with IDD; however, it is unclear if any others had been tested for IDD or related symptoms. What can be stated is that three (20%) sample members attend schooling for children with special needs – indicating intellectual deficit – but the remainder of the sample is in mainstream school and in the appropriate grade for their age, indicating that they are coping with their academic demands.

Shyness temperament and psychopathology in adolescents born at an ELBW

The shyness temperament is defined by Aron and Davies (2005) as "the fear of negative social evaluations that leads to discomfort and limitations on the desire for social contact (p.3)". Cheek and Buss (1981); Hopko et al. (2005), Janson and Mathiesen (2008) and Schmidt et al. (2008) found that shyness increases the probability of developing an affective-related disorder such as social anxiety. Social anxiety is seen as existing on a continuum from a very mild, nonclinical social anxiety (i.e. shyness) – through to severe and clinical levels of social phobia. Heiser et al. (2003) and Nigg (2006) indicate that social phobia and shyness increase the probability of being diagnosed with an alternative psychological disorder such as avoidant personality disorder and selective mutism. In this study, avoidant personality disorder and selective mutism were not investigated, but based on the current research it might have been fruitful to explore further.

In this study, shyness scores were significantly different in adolescents who had a previous diagnosis of a psychological disorder versus those that did not ($p = .007$). Even in this small sample, the literature indicating that the severity of shyness may impact the diagnosis of a psychological disorder is supported (Aron et al., 2005; Cheek & Buss, 1981; Schmidt & Fox, 1995). Schmidt et al. (2008) and Kelly, Nazroo, Mcmunn and Marmot (2001) found that the more shy adolescents are the lower their self-esteem is, and this leads to an increase in their experiences of social withdrawal, loneliness and decreased emotional well-being. This could possibly exacerbate the chances of developing a psychological disorder. According to the National Comorbidity Study,

shy individuals are about two times more likely to develop a psychological disorder, particularly an anxiety and mood disorder, than those in the general population (Kessler et al., 1994). However, the Kendall-tau-b correlation analysis between shyness and whether or not there was a previous diagnosis of a childhood psychiatric disorder ("No" was coded as 1 and "Yes" as 2), is strongly negative (r ={U+2212}.667 p =.013). This means that the more shy the adolescent, the less likely it is that he or she would have been diagnosed with a psychological disorder. The findings of this study differ from those of Heiser, Turner, Beidel and Roberson-nay (2009) and Kessler et al. (1994) – who found the more shy the adolescent, the more likely they were to have a comorbid psychological disorder. A possible reason for this is that shyness is seen to be on a continuum from a little shy through to extreme shyness. The more severe the individual's shyness is, the lower their self-esteem is, and the more fearful, self-isolating and inhibited they are relative to their peers. The increase in shyness predisposes the individual to develop a psychological disorder such as social phobia, avoidant personality disorder, anxiety and mutism (Heiser, Turner, Beidel, & Roberson-nay, 2009).

When examining whether or not an adolescent met the criteria for social phobia on the M.I.N.I, it emerged that the level of shyness was significantly different between the two groups (p =.041). Thus, the severity of shyness is related to the diagnosis of a social phobia disorder, as has been shown in previous studies (Cheek & Buss, 1981; Hopko et al., 2005; Janson & Mathiesen, 2008; Schmidt et al., 2008). While many shy people do not meet the criteria for social phobia, individuals diagnosed with social phobia have a greater number of social fears, a higher tendency to avoid social situations, more negative thoughts, and more somatic symptoms – than individuals who report being somewhat shy (on the lower end of the continuum) (Marshall & Lipsett, 1994; McNeil, 2001; Stein, 1999). A possible reason for this is that shy individuals may not overtly present with impairments in behavioural or emotional problems, and thus psychological disorders in this population may be under-reported (Beidel, Turner, & Morris, 1999).

Shyness may be a predisposing factor to the development of a psychological disorder such as social phobia (Heiser et al., 2003; Matsuda, Okanoya, & Myowa-Yamakoshi, 2013; Saigal et al., 2003; Schmidt et al., 2008). The relationship between shyness and psychopathology in ELBW adolescents would need to be explored on a larger scale to clarify if shyness plays a role in helping to conceal the development of a psychological disorder or in predisposing the ELBW child to the development of a phobia. Such hypotheses would need to be tested in a larger sample.

Strengths of the study

One of the strengths of this research is its novelty. There has been scant research on the long-term effects of ELBW from a psychological perspective in South Africa. This study has identified significant possible outcomes of ELBW. This makes a case for further research in this field. The exploration of various domains of an ELBW adolescent's life (biological, psychological and social) provides information for a wide

range of professionals on the longer-term impact of ELBW on survivors, particularly in adolescents. This allows for varying inputs on the intervention level to be considered, using the results of this study.

Furthermore, the research made use of standardised questionnaires that are also used in international research on ELBW. Although the sample is smaller than that in the international studies the trends can be useful in comparison to the international data.

The use of self-report questionnaires such as the RCBS and the M.I.N.I have both strengths and limitations. Some strengths of the self-report questionnaires are that they allow the respondent to report on personal experiences and to share their perspectives directly. Robins, Paulhus, Vazire, and Paulhus and Vazire (2007, p. 227) report that "no one else has access to more information" than oneself, and that this information is rich with motivational and other introspective details that others might not be aware of". Furthermore, self-report questionnaires allow the researcher to obtain information about situations that are not always observable and not necessarily easily available – e.g. reporting on family histories of mental illness. Self-report questionnaires are one of the most commonly used data-capturing measures in the social sciences and humanities, making it easier to compare data from other studies using similar methodologies (Van Berkel, 2009). A limitation of the use of the self-report questionnaires is that the results are subject to perceptual bias.

Limitations of the study and recommendations for future research

The small sample (N = 15) does not represent the larger ELBW population. Although a small sample study is a trend in ELBW literature (Saigal et al., 2003; Streiner et al., 2000; Saigal, Rosenbaum, Feeny, Burrows & Furlong, 2000) – generalising the findings is questionable in such cases. The small population is more problematic when a researcher attempts to carry out a longitudinal study, due to a high dropout rate, which then yields conflicting results across studies (Streiner et al., 2000; Saigal, Rosenbaum, Feeny, Burrows & Furlong, 2000). Future studies could plan to use a larger sample size. A longitudinal design which can be used to determine if changes over time are predictable, is also recommended.

All questionnaires were administered in English. This may have affected the response and the overall understanding of the questions for three (20%) respondents. Additional variables such as age, level of education and disability may have also limited the respondents' ability to report accurately on questionnaires.

There are two points to bear in mind regarding the choice of psychometric tests: Unfortunately, there is little data on the psychometric properties of the tests in South Africa's multi-cultural context. This should be taken into account when interpreting the data. In addition, the number of total items (133 items) should be reconsidered for future studies as the sample is likely to contain children with a wide variety of disabilities, which will require appropriate adjustments. In this study, two children had physical disabilities that prevented them from completing the questionnaires, thus the parent was

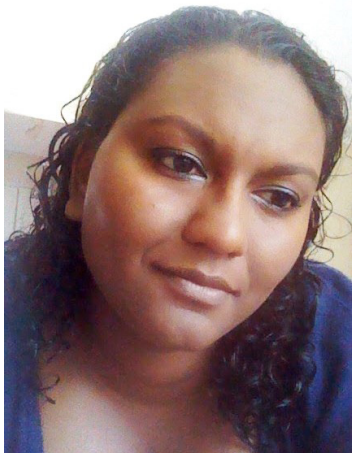
requested to answer the questions on behalf of the child. Zwicker and Harris (2008) found that parents of ELBW adolescents are more cautious and over-report medical and psychological symptoms related to their ELBW adolescent, which has been shown to affect their congruency of reporting with that of the adolescent's subjective experiences. As a result, the reporting of symptoms on the RCBS and M.I.N.I may have been skewed by the perception of the parents. It is recommended that for future studies reports are made by both parents and adolescents to ensure a more holistic picture of the ELBW life.

The M.I.N.I. 5.0.0 used in the assessment did not identify symptoms of ADHD commonly found in ELBW adolescents (De Pauw & Mervielde, 2010; Foley, McClowry, & Castellanos, 2008; Strang-Karlsson, 2011). Thus, parents were not able to report on attention and concentration symptoms reported on the biographical questionnaire. The Mini International Neuropsychiatric Interview for Children and Adolescents (M.I.N.I-KID) could be considered for future studies, as it is a shorter, structured diagnostic interview and does examine ADHD symptoms.

CONCLUSION

The aim of this study was to explore temperament and psychopathology in ELBW adolescents. Although this is ostensibly a pilot study with a small sample of only 15 ELBW children, shyness temperament, social phobia, ADHD symptoms, bipolar mood and GAD emerged as key descriptors of the sample. This study provides a unique insight into the longer-term effects of being born at ELBW and suggests that ELBW is linked to an inhibited temperament, and inhibition and disinhibition-related psychological disorders such as ADHD, GAD and social phobia. These results are highly significant for future planning around the management of ELBW individuals and therefore also for the allocation of physical, mental and social health resources. In striving to improve the quality of life of ELBW individuals, researchers, caregivers and intervention providers should aim to provide support for their holistic care and not focus solely on either the physical or psychological or social impacts of ELBW in isolation.

BIOGRAPHICAL NOTES



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DANNITA BORRAGEIRO is a registered clinical psychologist at Job Shimankana Tabane (JST) Hospital in the North West province. She completed her undergraduate and honours degrees at the University of Johannesburg and her Masters in Clinical Psychology at the University of South Africa. Dannita is also a member of the Golden Key International Society, a Society honouring academic excellence. She has worked at Baragwaneth and Tara hospitals, and now runs a small private practice. She focuses on work with patients to develop and use their individual personal resources in their treatment. With a growing interest in Child psychiatry, she has experience dealing with psychological issues facing child and adolescent patients and their families. In 2015, in conjunction with a psychiatrist, she started a children's clinic at the JST Hospital which specialises in diagnosing and treating ADHD, ASD and other related psychiatric conditions.

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