



Emotion regulation and affective experience among extremely low birth weight adult survivors in their 30's



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ABSTRACT

Although emotion regulatory processes and affective experiences have been explored among extremely low birth weight (ELBW; < 1000 g) survivors in childhood, little is known about these processes among ELBW survivors in adulthood. Furthermore, still less is known about whether ELBW survivors with neurosensory impairments (NSI) differ in emotion regulatory processes than ELBW survivors without NSI. Participants comprised 100 ELBW survivors (80 without NSI and 20 with NSI) and 89 normal birth weight (NBW) controls matched on age, familial socioeconomic status, and sex in childhood who were prospectively followed into adulthood. At age 30–35 years, participants completed self-report measures, including the Positive and Negative Affect Schedule and the Affective Styles Questionnaire. ELBW survivors reported significantly less positive affect than NBW participants. As well, ELBW survivors with NSI reported a higher tolerance of negative emotions and more concealment of emotions from others compared to ELBW individuals without NSI. These findings of differential emotion regulatory processes and affective experiences in ELBW and NBW may underlie increased rates of psychopathology observed among some ELBW adult survivors.

1. Introduction

Due to improvements in neonatal intensive care, the life expectancy of individuals born at extremely low birth weight (ELBW; < 1000 g) has increased over the past several decades (Doyle, 2004). Despite increased rates of survival, being born at ELBW is nonetheless associated with unique developmental difficulties in multiple domains across the lifespan. For example, ELBW survivors are more likely to have neurosensory impairments (NSI) such as cerebral palsy, deafness, and blindness (Doyle & Anderson, 2010) than those born at normal birth weight (NBW; > 2500 g). Prenatal brain insults are present at higher rates in ELBW survivors and may not only manifest in physical difficulties, but can result in impairment in cognitive and social domains as well (Volpe, 2009).

Being born at ELBW is associated with structural and functional differences in brain regions, including the amygdala (Peterson et al., 2000), hippocampus (Rogers et al., 2012), and prefrontal cortices (Zubiaurre-Elorza et al., 2012), which are associated with an increased risk for psychiatric problems (Kennedy & Adolphs, 2012; Shaw et al., 2012). Indeed, ELBW survivors are at higher risk for internalizing disorders such as anxiety and depression in childhood (Conrad, Richman,

Lindgren, & Nopoulos, 2010; Spittle et al., 2009), adolescence (Grunau, Whitfield, & Fay, 2004; Saigal, Pinelli, Hoult, Kim, & Boyle, 2003), and adulthood (Boyle et al., 2011; Dahl et al., 2006; Van Lieshout, Boyle, Saigal, Morrison, & Schmidt, 2015; see Mathewson et al., 2017, for a recent meta-analysis) compared to those born at NBW.

Although the origins of internalizing (e.g., depression and anxiety) and externalizing (e.g., attention and oppositional behaviors) problems are multi-determined, the regulation and dysregulation of emotions are thought to play a particularly critical role in the development and maintenance of psychopathology (Silk, Steinberg, & Morris, 2003; Zeman, Shipman, & Suveg, 2002). Emotions (i.e., affect) are complex, biologically-based processes that allow for adaptive evaluation of the environment and modification of behavior (Gross & Muñoz, 1995; Pollak, 2011) and their dysregulation is known to underlie psychological problems. Indeed, a combination of high negative affect and low positive affect has been implicated in the development and maintenance of internalizing disorders (Brown, Chorpita, & Barlow, 1998; Clark & Watson, 1991; Watson, Clark, & Carey, 1988).

Emotion regulation refers to strategies directed at which emotions are felt and how these emotions are expressed (Gross & Muñoz, 1995). Hofmann and Kashdan (2010) identified three major strategies for

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regulating emotions once an emotional response has been deployed. Concealing strategies refer to suppression, avoidance, and hiding of emotions. Adjusting strategies refer to accessing and using emotions adaptively within different contexts. These strategies consist of correctly identifying emotional states as they are occurring, and then using this information to problem solve or modulate the emotional response, allowing for appropriate behavioral responses and affective experiences in different contexts (Mennin, Heimberg, Turk, & Fresco, 2002). Tolerating strategies refer to comfort and acceptance in the face of highly arousing emotions. Tolerating strategies are associated with fewer negative emotions than suppression-based strategies (Hofmann, Heering, Sawyer, & Asnaani, 2009), and a reduction in reports of subjective distress and physiological reactions typically associated with negative emotional states (e.g., Wolgast, Lundh, & Viborg, 2011). Tolerating strategies are therefore generally considered adaptive. Adjusting regulation strategies are regarded as more positive, while concealing strategies are thought to be more negative (Gross & John, 2003; Hofmann & Kashdan, 2010). Ineffective emotion regulation has also been associated with internalizing (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Barkley & Fischer, 2010; Gross & Muñoz, 1995; Musser et al., 2011) and externalizing problems (Silk et al., 2003; Zeman et al., 2002).

Although a number of studies have examined both emotion regulatory processes and emotion experiences in ELBW survivors among childhood and adolescence (Anderson & Doyle, 2004; Clark, Woodward, Horwood, & Moor, 2008; Janssens et al., 2009; Lowe, Woodward, & Papile, 2005; Shirley, 1939; Spungen & Farran, 1986; Wolf et al., 2002), to our knowledge, none have systematically, empirically examined these outcomes in adulthood. ELBW and very low birth weight (VLBW < 1500 g) infants and toddlers have been rated as more emotionally negative (Shirley, 1939; Spungen & Farran, 1986), as well as displaying more problems with emotion regulation (Clark et al., 2008; Janssens et al., 2009; Wolf et al., 2002) than term infants. Disruption to emotion regulatory processes continues into childhood for ELBW individuals, as they are known to display less emotional control than NBW individuals (Anderson & Doyle, 2004). However, emotion regulatory processes and affective experiences of ELBW survivors beyond childhood have yet to be fully examined. Furthermore, even less is known about emotion regulatory processes in ELBW survivors who have NSI relative to those without NSI, as they are not considered separately from ELBW survivors, or removed usually from analyses (Lowe et al., 2005).

Although most internalizing disorders have emerged by age 30, (American Psychiatric Association, 2013) recent findings by our group (Van Lieshout et al., 2017) suggest that ELBW adults do not show the typical age-related decline in internalizing problems (Rawana & Morgan, 2014) between adolescence (12–16 years) and adulthood (30–35 years). Given that ELBW survivors manifest different developmental trajectories of internalizing problems throughout their life, and that these problems appear to be more persistent in the ELBW population in adulthood, it is important to continue exploring underlying factors that might contribute to psychopathology such as emotion regulatory processes and affective experiences.

Given that ELBW survivors with NSI may face even more postnatal adversity due to their experience of overt disability (Anderson, Doyle, & Victorian Infant Collaborative Study Group, 2003), the accumulation of both prenatal and postnatal risk may result in a different experience of emotional problems relative to those ELBW survivors without NSI. Early life experiences have been shown to influence both affect and emotional regulatory experiences, (Pollak, 2008) and so these individuals may develop different ways of regulating emotions owing to their unique life experiences. Considering the emotion regulatory processes of ELBW survivors with NSI separately from those ELBW survivors without NSI can shed light on how NSI interacts with the effects of being born at an ELBW.

The ability to regulate one's emotions is important to consider in

ELBW survivors, as it may be a potential mechanism underlying and maintaining the increased risk for psychiatric problems seen in this population. Given that psychiatric disorders faced by individuals born at ELBW are likely to persist into adulthood (Boyle et al., 2011; Dahl et al., 2006; Mathewson et al., 2017; Van Lieshout et al., 2015), it is plausible that the experience of more negative, less positive emotion as well as emotion regulatory problems found in ELBW survivors in childhood may also persist into later life. A first step to understanding psychiatric problems in ELBW survivors is to understand some of the precipitating correlates/mechanisms that may underlie them.

There were two objectives of the present study. First, we examined whether adult ELBW survivors differed from NBW controls on self-reported emotion regulation strategies and affective experiences. We predicted that ELBW survivors would display less positive affect, and more negative affect than NBW individuals. We also predicted that ELBW participants would engage in emotion regulation strategies regarded as negative, such as concealment, and fewer positive strategies, such as adjusting or tolerating than NBW individuals.

Second, we examined whether adult ELBW survivors with NSI and ELBW adults without NSI differed on self-reported emotion regulation strategies and affect. Given that ELBW survivors with NSI may face increased adversity relative to their ELBW non-NSI counterparts, we predicted that there would be a difference in both the emotion regulation strategies used and affective experiences reported between these ELBW NSI and non-NSI groups. Specifically, we expected that NSI ELBW survivors would display more negative and less positive affect compared to the non-NSI impaired ELBW survivors, and display less positive emotion regulation strategies.

2. Method

2.1. Participants

Participants born at extremely low birth weight (ELBW; < 1000 g) were recruited at birth from central-west Ontario, Canada between 1977 and 1982 (Saigal, Rosenbaum, Stoskopf, & Sinclair, 1984) and have been followed longitudinally into adulthood. Of the 397 infants initially enrolled, 179 survived until hospital discharge. A further 14 children died subsequently. In the present study, of the available survivors, a total of 100 out of 165 (60.61%) participated in the most recent follow-up assessment at age 30–35 years. In our current sample, 20 ELBW survivors (20%) had a diagnosed NSI. We defined NSI as at least one of the following: deafness, blindness, intellectual disability, microcephaly, or cerebral palsy diagnosed by a developmental pediatrician in childhood.

When the ELBW participants were 8 years of age, 145 matched NBW controls were recruited from the Hamilton Public School System (Saigal, Szatmari, Rosenbaum, Campbell, & King, 1991). These NBW participants were born at term and matched with the ELBW survivors on age, familial socioeconomic (SES) status, and sex. In the present study, 89 of the original 144 NBW survivors (61.8%) completed the assessment at age 30–35. One NBW adult who participated had a diagnosed NSI.

2.2. Procedure

As part of a larger assessment examining the psychological and physical outcomes of adult survivors of ELBW (see Saigal et al., 2016; Van Lieshout et al., 2015), the present study focused on the self-reported measures of emotion regulation and affective experiences. The analyses below focus on these measures. This study received approval from the McMaster University Health Sciences Research Ethics Board, and testing was conducted at the Child Emotion Laboratory at McMaster University.

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