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Bowman Siann (Orcid ID: 0000-0002-6548-9631)

Expanding the search for emerging mental ill health to safeguard student potential and vocational success in high school – a narrative review

Authors

1. Siann Bowman, Department of Occupational Therapy, School of Allied Health, LaTrobe University Melbourne Australia.

2. Dr Carol McKinstry, Department of Occupational Therapy, LaTrobe Rural Health School, LaTrobe University Melbourne Australia.

3. Dr Linsey Howie, Department of Occupational Therapy, School of Clinical and Community Allied Health, LaTrobe University Melbourne Australia.

4. Professor Patrick McGorry, The National Centre of Excellence in Youth Mental Health, Orygen. The University of Melbourne.

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Corresponding Author: Siann Bowman s.bowman@latrobe.edu.au

Department of Occupational Therapy, School of Allied Health, LaTrobe University Melbourne Australia.

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ABSTRACT

Expanding the search for emerging mental ill health to safeguard student potential and vocational success in high school – a narrative review

Abstract -

Aim –Young people experiencing mental ill health are more likely than their healthy aged peers to drop out of high school. This can result in social exclusion and vocational derailment. Identifying young people at risk and taking action before an illness is established or school dropout occurs is an important goal. This study aimed to examine evidence for the risk markers and at risk mental states of the clinical staging model (Stage 0 – 1b), and whether these risk states and early symptoms impact school participation and academic attainment.

Method – This narrative review assembles research from both the psychiatry and education literature. It examines Stage 0 to Stage 1b of the clinical staging model and links the risk states and early symptoms to evidence about the academic success of young people in high school.

Results - In accordance with the clinical staging model and evidence from education literature, childhood trauma and parental mental illness can impact school engagement and academic progress. Sleep disturbance can result in academic failure. Undifferentiated depression and anxiety can increase the risk for school dropout. Subthreshold psychosis and hypomanic states are associated with functional impairment and high rates of NEET but are not recognised in the education literature.

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Conclusion - Risk markers for emerging mental ill health can be identified in education research and demonstrate an impact on a student's success in high school. Clear referral protocols need to be embedded into school life to reduce risk of progression to later stages of illness and support school participation and success.

Key Words: at risk mental state, ultra high risk, clinical high risk, clinical staging, high school

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INTRODUCTION

Young people on the threshold of adult life have hopes and dreams and seek a meaningful and contributing life. The greatest threat to this is mental ill health that typically occurs when the educational building blocks of a future working life are assembled. Mental ill health has a significant impact on developmental trajectories of young people and contributes to the global economic burden of non-communicable disease (Bloom, 2011; Patel, 2007). Identifying young people at risk of developing mental illness and taking action before the illness is established is therefore an important goal. There is little acknowledgement in the literature about emerging mental ill health and the academic success of young people. There is however evidence in the education literature about the individual factors that negatively impact high school participation and achievement. These two areas of research are not often brought together, which is problematic because they both aim to improve outcomes for young people and overlap in their findings in terms of risk factors for poor functional performance.

Adolescence and early adulthood are the peak periods for the onset of most mental illnesses, with up to 75% emerging before the age of 25 (Kessler, 2005, 2007). Half of all lifetime cases of mental illness are apparent by the age of 14 (ABS, 2008, AIHW, 2011). In Australia, one in every five adolescents is likely to experience clinical depression by the age of 18 (ABS, 2008; Birmaher, 1996; Kessler, 2005; Lewisohn, 1993). Anxiety and depression are the leading contributors to the burden of disease for young Australians (AIHW, 2011). The most common anxiety disorders are social anxiety and posttraumatic stress disorder, with half experiencing their first symptoms by the age of 11 (AIHW, 2011; Kessler, 2007).

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Psychotic disorders are the third leading contributor to the burden of disease in Australian males aged 15–24 and the fifth leading contributor for females (ABS, 2008; AIHW, 2011; Jeblensky, 1999). Substance use disorders in young people aged 16-24 is estimated to be 12.7% (AIHW, 2011). These findings lead to calls for identification and safe interventions to be delivered as early as possible to avoid illness progression and improve functional outcomes (McGorry, 2010). In response to this challenge and the low level of service use by young people, a developing network of primary level early intervention mental health services for individuals aged 12 to 25 has been established across Australia—called "*headspace*" (Rickwood, 2013). This Australian program is just one example of international innovations in youth mental health care with others established in the USA, UK and Ireland (McFarlane, 2010; McGorry, 2013).

Adolescents spend more time in school than in any other formal institution, and schools offer an essential pillar in the scaffolding necessary for adolescents' transition to adulthood (Arnett, 2010; Rutter, 1979). Schools play a key part in a young person's development, including peer relationships, identity formation, knowledge acquisition, academic progress, emotional control and physical and moral development (Arnett, 2010). These areas are all impacted by mental ill health (Cross, 2014). Young people, who do not finish school due to mental ill health, experience a greater likelihood of low self-esteem and fragile identity, social exclusion, functional disability and vocational derailment (Goulding, 2010; Isohanni, 1998; McGorry, 2013; Stein, 2012).

Young people who leave high school prematurely and are without a job are described in policy circles as ''NEET'' (Not in Employment, Education, or Training) (OECD, 2012).

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Those who are NEET early on in life are more likely to be NEET later in life, indicating a higher risk of chronic unemployment and socio-economic disadvantage (Franzen, 2005; National Statistics of the United Kingdom, 2010; Quintini, 2007). One of the risk factors associated with NEET status is low academic achievement (National Statistics of the United Kingdom, 2010; O'Dea, 2016; Quintini, 2007). 'Days spent out of role', is another measure of inability to carry out day to day activities and has been used worldwide as a measure of impact (ACOEM, 2009; Davis, 2005; Loeppke, 2009). Days spent out of role due to mental illness is a major source of lost human capital across the world (Alonso et al., 2011; Merikangas, 2007; Suhrcke, 2008;). The high proportion of adolescents presenting as NEET and 'out of role' to *headspace* suggests that these early intervention services are, in many cases, not delivered early enough (O'Dea, 2016).

Prospective Australian, European, American and Mexican studies show that disengagement from high school often occurs for young people experiencing mental ill health (Benjet, 2012; Cross, 2014; Eurofound, 2012; McGorry, 2013; Stein, 2012). In an Australian National Survey of Psychosis, 68% of participants had not finished high school (n = 1825) (Waghorn, 2012). Recent studies with first episode psychosis (FEP) populations also indicate that over 50% have less than 10 years of education (Bowman, 2017). The pattern is also similar for other complex and potentially severe mental illnesses such as major mood disorders, anxiety disorders, eating disorders and borderline personality disorder with prospective international evidence (Australia, Canada, China, Finland, India, Mexica, Netherlands and New Zealand) demonstrating that 46% of school dropout is attributed to these disorders (Riglin, 2013). Finishing high school can clearly be difficult for young people

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experiencing mental ill health and they are more likely than their healthy aged peers to drop out of school (Leach, 2012; Riglin, 2013, 2014; Waghorn, 2012).

Research from Canada, Australia, America and the UK has identified common risk markers for the development of mental ill health and these include sleep disturbance, childhood trauma, having a family member with serious mental illness, poor psychosocial functioning, substance use, anxiety and depression (Addington, 2017; Amminger, 2006; Cannon, 2008; Davey, 2019; Fusar-Poli, 2014; Grierson, 2017; Hartmann, 2017, 2018; Kendler, 2014; Kraan, 2015; McGorry, 2007, 2010, 2013, 2014; Thompson, 2009, 2011; Velthorst, 2010; Yung, 2004). These often undifferentiated symptoms can progress to subthreshold states of psychosis, bipolar and moderate depression alongside functional decline (Hartmann, 2018; McGorry, 2018). In the early stages of mental ill health, diffuse and unstable subthreshold states of anxiety and depression are common, often commingled with psychotic-like disturbances and emotional dysregulation, to produce a series of phenotypes (Hickie, 2013; McGorry, 2016, 2013, 2018; van Os, 2017). A serious treatment gap exists with only a minority of young people being able to access quality care when these symptoms arise. The problem of identifying emerging mental ill health and delivering effective treatment is an urgent issue.

The at risk/clinical high risk/ultra high risk (UHR) concept originated from the knowledge that psychosis is preceded by subthreshold symptoms of insufficient severity and clarity to justify a diagnosis but there is still a need for care (McGorry, 2013, 2014, 2018, Hartmann, 2018). This resulted in the conceptualisation of the prodromal period as an “at risk mental state.” The “at risk mental state” for psychosis research paradigm has illuminated the

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risk factors involved in psychosis onset, the limitations of diagnostic systems and risk identification approaches, the diffuse and unstable symptom patterns in early stages, and their potential transdiagnostic trajectories (Hartmann, 2018; McGorry, 2018).

It has become increasingly evident that the "at risk mental state" (ARMS) status extends beyond risk of transition to psychosis (McGorry 2018; McHugh, 2018; Nelson, 2018; Yung, 2017). Most individuals who meet criteria will not develop a psychotic disorder but will experience poor psychosocial functioning (de Wit, 2014; Nelson, 2013; Rutigliano, 2016; Simon, 2011). Progression to persistent mood, anxiety, personality and/or substance use disorders is a very common outcome, as is suicide risk (Fusar-Poli, 2014; Lin, 2015; Rutigliano, 2016). Hence, extending the boundary beyond psychosis is essential (de Wit, 2014; Lin, 2015; Rutigliano, 2016). In addition, it is recognised that the "at risk mental state" should be a syndrome in its own right as well as a risk marker for disorder progression (McGorry, 2018; Polari, 2018). Such findings have driven a reframing of "at risk mental state" (ARMS) as a clinical state signifying transdiagnostic risk and need for clinical care (McGorry, 2006; McGorry, 2016; Yung, 2012; van Os, 2017). Henceforth throughout the paper ARMS will refer to this definition.

The clinical staging model developed by McGorry, Hickie and colleagues adapts the ARMS approach to encompass a collection of syndromes within a single 'transdiagnostic 'model (one non-clinical and four clinical stages) (Hickie et al., 2013; McGorry et al., 2006). Early clinical stages are characterised by phenotypes that are milder in symptom severity, lack specific or fully formed syndromal features and are associated with less impairment. Later stages are characterised by more severe symptom, functional impairment and clear

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evidence of stability, persistence or reoccurrence (Cross et al., 2014; Hickie et al., 2013, McGorry, 2019) (Table 1).

The model proposes that the emergence of earlier stages of mental ill health represents a modifiable risk of progression to later and more serious stages of illness (Cross, 2014; Hartmann, 2017, 2018; McGorry, 2007, 2013, 2014, 2018). Disorder states are defined according to stages, ranging from a pre-symptomatic at-risk stage (stage 0 = family history of mental illness, history of trauma), to undifferentiated general symptoms (stage 1a = e.g. sleep disturbance, anxiety, depression, help seeking with distress; mild functional decline), to moderate and more specific symptoms alongside functional decline (stage 1b = attenuated psychotic symptoms, subthreshold bipolar states, moderate depression) (Cross, 2014; Hartmann, 2017, 2018; McGorry, 2007, 2013; 2010; 2014, 2018). Further stages include full-threshold (stage 2), more persistent (stage 3), and severe, unremitted illness (stage 4) (McGorry, 2007, 2013; 2010; 2014, 2018) (Figure 1).

Randomized control trials conducted in Australia, Austria and the UK demonstrate that early detection and intervention provided for individuals experiencing ARMS could prevent the onset of a fully-fledged disorder and promote improved functioning (Yung, 2007, 2011, 2017). Education research demonstrates that mental ill health in high school students is a growing problem significantly impacting participation, educational outcomes and is a major concern for school staff (Dewald, 2010; Farahati, 2003; Garvik, 2013; Overstreet, 2011; Perfect, 2016; Taras, 2015). This narrative review aims to examine the identified risk markers (Stage 0) for the development of mental ill health, and the at risk mental states identified in Stage 1a and 1b of the clinical staging model (Hartmann et al., 2017; 2018; McGorry, 2007;

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2010; 2013; 2014). They have been studied in ARMS samples but not specifically in terms of their impact on school functioning. Characteristics of Stage 0 and 1a are however identified in the education literature for their negative impact on high school participation and educational success. This review therefore examined evidence from both the youth mental health and the education research specifically related to high school. In accordance with The International Standard Classification of Education (ISCED), this includes levels 2 and 3 (lower and upper secondary education) (ISCED, 2011).

METHOD

Narrative reviews have been considered by scholars (e.g. Grant, 2009) to be a review in which an empirical lens comparing diverse bodies of work can enable "conceptual innovation" to form a hypothesis, serving as a subsequent "launch pad" for further research (p.93). Baumeister and Leary (1977) proposed that narrative reviews are useful when trying to link a number of studies on different topics together to enable interconnection or re-interpretation to occur. These authors proposed the purpose for narrative reviews is to develop a theory. Common limitations of narrative reviews are they tend to report on the conclusions of the study rather than providing an adequate description of the research design and results, and lack critical appraisal of the evidence.

The overarching goal of this review is to present an argument that the characteristics of ARMS may impact academic performance and participation in high school. It was found that education has not been explored empirically in this population. Considering there was no research specifically reviewing this question in the psychiatric research, the education research was reviewed. It was evident that the characteristics of ARMS Stage 0-1a were

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identified by researchers in education, and they had evaluated their impact on high school performance.

We have aimed to strike a balance between purposeful selection and systematic coverage of the literature to help us best present a case for this review. We focused on identifying the most significant literature with regard to the aims of our paper, rather than producing a comprehensive search using systematic processes. To best capture the current state and quality of the research field studies were not excluded based on quality and therefore all eligible articles were included. Each article was critically evaluated by the first author according to key results, limitations, suitability of methods used to test the initial hypothesis; quality of result obtained; interpretation of results; impact of the conclusions in the field. PRISMA guidelines were followed where possible however given that the current research is a narrative review PRISMA guidelines were largely not applicable.

Searches were conducted and evidence retrieved from the databases CINAHL, MEDLINE, Psych LIT, Psych INFO and Education SAGE from 1995 to 2019 to identify English language peer reviewed articles reporting characteristics of ARMS Clinical Stages 0 – 1b. Articles were included from the education literature that identified these characteristics as impacting high school performance and academic achievement. Please see Table 2 for comprehensive Search Strategy and Figure 2 for Flow Chart of the Literature Selection Process for Review. All citations were imported into endnote, duplicates were detected and subsequently deleted. Titles and abstracts were screened by the first author. All potentially relevant articles were downloaded in full text and reviewed for final inclusion against the eligibility criteria.

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There were no studies specifically investigating the high school participation and academic attainment of individuals with ARMS in Clinical Stages 0-1b. No studies have been conducted with school personnel exploring their understanding and experience of students with ARMS. Education literature demonstrates that the characteristics of Clinical Stages 0-1a can impact high school performance and academic success.

This study aims to answer the following research questions:

1. What are the characteristics of the Clinical Staging Model Stages 0-1b?
2. Is there evidence in the psychiatric literature that these characteristics impact high school performance and academic achievement?
3. Is there evidence in the education literature that these characteristic impact high school performance and academic achievement?

RESULTS

The characteristics of each clinical stage will now be discussed. Clinical Stage 0 is explored first, then Clinical Stage 1a and then 1b. Within each stage and for each characteristic, the psychiatry research is presented followed by the education research. The psychiatry research demonstrates a focus on prevalence and impact on the young person. The education research focuses on the characteristics that impact high school performance and academic success. Key findings for each Stage and presented in Table 3, 4 and 5.

CLINICAL STAGING MODEL STAGE 0 – ASYMPTOMATIC, AT RISK POPULATIONS

Childhood trauma and ARMS

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Childhood trauma is defined in the research as physical, psychological, sexual, emotional abuse or neglect before the age of 17 years (Bechdolf, 2010; Kraan, 2015; Thompson, 2013). This experience results in disruption to child and adolescent development (Gerrity, 2008; Putnam, 2006). International survey studies Germany, New Zealand, USA and The Netherlands demonstrate a significantly high prevalence of childhood trauma for individuals who experience mood and anxiety disorders, substance use disorders, personality disorders, and psychosis (Campbell, 2007; Chapman, 2004; Felitti, 1998; Fernando, 2014; Gibb, 2008; Kessler, 1997; Khan, 2015; Muenzenmaier, 2015; Putman, 2006; Read, 2005; Spinhoven, 2010; Widom, 2007). Epidemiological research, retrospective cohort studies and survey studies from Australia and the USA have demonstrated that sexual abuse specifically is a risk factor for developing post traumatic stress disorder, eating disorders, substance use disorders, suicidal behaviour and psychosis (Al Mamun, 2007; Dube, 2005; Felitti, 1998; Kendler, 2000; Mayo, 2017; Young, 2007). If childhood trauma was entirely removed from the population, the number of people with psychosis would be reduced by a third (Bendall, 2008). Childhood trauma is clearly a risk factor for vulnerability to psychopathology (Fusar-Poli, 2012; Putnam, 2006; Tunnard, 2014).

Cross-sectional studies and meta-analyses from the USA, Australia, Canada, Turkey, and Finland have found consistently high rates of childhood trauma in ARMS populations when compared to the general population (Addington, 2013; Bechdolf, 2010; Devylder, 2013; Falukozi, 2012; Kline, 2018; Kraan, 2015; Magaud, 2013; Sahin, 2013; Yung, 2015). For example, in the USA, Thompson and colleagues (2009) found in an ARMS sample (n = 30), that 97% had experienced at least one form of trauma - 83% reported physical abuse,

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67% reported emotional abuse, and 27% sexual abuse. A systematic review and meta-analysis investigating adolescents with ARMS, also found high rates of experienced emotional abuse, physical abuse, and bullying (Peh, 2018). Studies have also investigated whether childhood trauma predicts conversion to psychosis in ARMS samples and sexual trauma was the strongest predictor of transition (Bechdolf, 2010; Thompson, 2013; Varese, 2012). There is no research evidence demonstrating that childhood trauma correlates specifically with negative academic outcomes in ARMS samples as it has not been researched before. The education literature will now be reviewed to ascertain the evidence about childhood trauma and academic performance.

Childhood trauma and high school participation

International education research from Australia, Brazil, Canada, Colombo, Japan, Palestine, Sweden, UK and USA demonstrates that the neurobiological, cognitive, social and emotional impact of childhood trauma can interfere with school functioning resulting in learning problems, low grades, need for special education, low attendance and increases in problem behaviour (Perfect, 2016; Woodbridge, 2016). Multiple longitudinal and cross sectional studies conducted in the United States, Australia, Israel and the UK have found significant attention, language, memory, processing speed, perceptual reasoning and verbal comprehension problems in high school students who have been exposed to childhood trauma (De Bellis, 2014; DePrince, 2009; Elbert, 2009; Husain, 2016; Kira, 2014; 2012Schoeman, 2009; Trickett, 2011; Viezel, 2015). These cognitive issues result in significantly lower academic ability in reading, English, maths and science as evident in low

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test scores (Delaney-Black, 2002; Duplechain, 2008; Fantuzzo, 2011; Lansford, 2002; McLean, 2013; Overstreet, 2011; Perfect, 2016). Longitudinal studies demonstrate that students who have experienced childhood trauma find it difficult to stay in high school because they find coping with the workload difficult and this negatively impacts engagement and attendance (Lansford, 2002; McLean, 2013; Perzow, 2013; Shonk, 2001). Further, in an American study, high school students who had experienced childhood trauma reported feeling socially excluded, not involved in school activities and not safe in the student –teacher relationship (n = 149) (Perzow, 2013). This resulted in reduced motivation to stay at high school. Findings from cross sectional and qualitative studies from the United States, Sweden, Netherlands and Australia with high school teachers indicate that they observe higher levels of depression, anxiety and social exclusion among students who have experienced childhood trauma compared to those who had not (Daignault, 2009; Lamers-Winkelman, 2012; Shonk, 2001; Woodbridge, 2016).

Family history of mental illness and ARMS

A family history of mental illness represents one of the most significant predictors of mental illness in individuals (Kendler, 2005; 2014). Studies over the past four decades have established a strong connection between mental illness of parents and an increased lifetime risk of psychiatric illness for their children ranging from 41% to 77% (Kendler, 2005; 2014). Between 21 to 23 % of adolescents in Victoria, Australia have a parent with a mental illness (Maybery, 2009; Reupert, 2013).

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Elevated risk for children has been reported for the whole diagnostic spectrum of parental mental illness such as substance abuse, anxiety disorders, panic disorder, obsessive compulsive disorder, depression, dysthymic disorder, bipolar affective disorder, psychotic disorders, eating disorders, suicide and personality disorders in multiple cross-sectional and longitudinal studies throughout the world (Birmaher, 2009; Black, 2003; Bronisch, 2008; Cannon, 2005; Coolidge, 2001; DelBello, 2001; Lizardi, 2004; Maziade, 2008; Park, 2003; Stowkowy, 2013; Weissman, 2006). The evidence suggests that children of parents with a mental illness have an increased risk of developing the same disorder as their parents, but there is also evidence that these children are at increased risk of developing a wide range of mental health disorders (Bijl, 2002; Lieb, 2002; Lizardi, 2004). For example, a large prospective longitudinal community study (n = 2427) conducted in Germany, demonstrated that major depression in parents increased the risk of their offspring having major depression, substance use disorder, bipolar disorder and anxiety disorder (Lieb, 2002). In a representative sample of the Dutch population (n = 78147), Biljl and colleagues (2002) found that parental mental illness was strongly related to mental illness in their children independent of type of parental illness. When childhood adversities and demographic variables were controlled for, parental mental illness remained significant. A longitudinal study by Weissman (2006) in the USA found that children of parents with major depressive disorder had a five times greater risk of adolescent depression, a three times greater risk of anxiety disorder, and a five times greater risk of alcohol dependence when compared with children of parents without a psychiatric disorder. Increased risk of multiple disorders has also been reported among children of parents with schizophrenia in longitudinal studies (Hans, 2004; Keshavan, 2008;

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Niemi, 2004). This study demonstrates that children whose parents have a mental illness constitute an important high risk group.

Not only are children with a family history at elevated risk of developing a mental illness, they can also experience a home environment different from other children. A prospective cohort study involving children of the entire Danish population born after 1982 (n = 1,823,625) found that living arrangements of children whose parents had a serious mental illness (schizophrenia, bipolar affective disorder, or depression) differed from the general population (Ranning, 2016). Most children lived with a single mother or away from both parents, more relationships between parents had dissolved, and parents with schizophrenia had the most parenting difficulties.

Adolescents have reported in qualitative studies that when parents are hospitalised or acutely unwell, it is difficult for them to manage practically and emotionally (Fudge, 2004; Maybery, 2006). During a parent's hospitalization, the level of risk for children is high because there is no one to look after them particularly in single parent families (Maybery, 2009). The home environment might at times be chaotic and threatening (Maybery, 2009). Children report having problems accessing transport to visit their parent in hospital, limited finances, difficult separation from their siblings (e.g. whilst in foster care) and difficulty coping with the unfriendly nature of the psychiatric hospital environment. Adolescents also assumed domestic and caring responsibilities for their mentally ill parent and/or younger siblings, particularly in single parent families (Aldridge, 2003).

Findings from qualitative studies report adolescents can become socially isolated when they care for their mentally ill parent instead of spending time with friends or playing

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sports (Aldridge, 2003). Specific outcomes include higher dropout rates from school (Farahati, 2003) and an increased likelihood of being taken into state care (Leschied, 2005). This can result in high stress, attachment difficulties, exposure to abuse and neglect and identity problems (Ashman, 2002; Cicchetti, 1998; Goodman, 1999, Leinonen, 2003). A family history of mental illness is identified as a highly significant factor in ARMS (Fusar-Poli, 2012; 2013; 2016; Yung, 2004).

Having a parent with mental illness and high school performance

There is limited research relating to academic progress and having a parent with a mental illness. In the only study found that examined the link, Farahati and colleagues (2003), using survey methodology (n =3389), reported an increased probability of high school dropout, particularly if there was maternal mental illness. One reason for this may be that a parent's mental illness limits their ability to be involved in their child's education. Parental involvement is known to facilitate positive youth development and improve academic functioning among adolescents (Epstein, 2006; Hill, 2004; Roeser, 2000; Seginer, 2006; Wang, 2012). In an American longitudinal study (Wang, 2014) (n = 1056; age 15-17yrs), the researchers found that parental involvement improved academic and emotional functioning in adolescents and predicted academic achievement (Wang, 2014). Parents with mental illness may find contributions to their child's school life difficult to maintain, consequently impacting their child's school experience.

Family adversity can also negatively impact an adolescent's achievements and participation in high school. In an American survey study examining the association between family adversity and academic outcomes (n = 65,680; age 6-17yrs), children

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experiencing family adversity were less likely to be engaged in school (Porche, 2016). Chaotic home environments can result in school absenteeism while less parental monitoring can result in truancy and increased at risk behaviours (Chilcoat, 1996; Stattin, 2000). Emotional unavailability and detached parenting results in practical neglect in terms of paying school fees, arriving on time to school, having clean uniforms, the provision of school lunches and being picked up at the correct time (Oysterman, 2000). Due to the difficulties parents with serious mental illness experience, adolescents may be less likely to engage in school, be required to take on domestic chores and responsibilities and encounter significant obstacles that impact effective participation in high school (Table 3).

CLINICAL STAGING MODEL STAGE 1a – SLEEP DISTURBANCE, DETERIORATION IN FUNCTIONING, NON-SPECIFIC ANXIETY AND DEPRESSION

Sleep disturbance and ARMS

Sleep is an adaptive function of humans during which the restoration of brain processes occur including strengthening of the immune system, growth, major metabolic processes, memory consolidation and brain plasticity (Durmer, 2005; Maquet, 1995; Stickgold, 2001). Sleep is vital to neural restoration and physiological maintenance across multiple systems (Chaput, 2016). Healthy sleep is linked to clearance of metabolic waste from the brain and enhancement of cognitive function (Konjarski, 2018). Sleep loss is linked to deficits in cognitive function, dysregulation of circadian processes such as cortisol secretion, and impaired emotional regulation (Short, 2015). There is increasing recognition that sleep disturbance is a contributory causal factor for many mental health problems (Harvey, 2009). Impaired sleep is established in research as a clinical risk factor for mood

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disorders, psychotic disorders and anxiety disorders (Briekzke 2012; Harvey, 2008; Ritter, 2012; Ruhrmann, 2010).

Sleep disturbance is defined in the research as detrimental changes to sleep function and include delays in falling asleep, difficulties with sleep maintenance, a reduction in total sleep time, multiple awakenings during sleep, nightmares and non-restorative sleep (Bensen, 2008; Carskadon, 2005; Lucchesi, 2005: Ohayon, 2004; Poulin, 2003; Zanini, 2013). Adolescence may be a particular risk for the onset of sleep problems due to a combination of biological, social and environmental changes which occur during this period (Carskadon, 2005; Harvey, 2016). A shift in circadian rhythms following puberty interacts with social and behavioural changes in adolescence (such as reduced parental oversight and increased social media) to delay the sleep phase at night. The inability to delay the wake up time due to school results in a reduced sleep window and can precipitate sleep disturbance (Bradley, 2018). Thus sleep problems in adolescence are associated with mental health problems such as suicidal thoughts and self-harm behaviour (Gradisa, 2011; Johnson, 2006; Ohayon, 2004; Wong, 2011). Sleep disturbance represents an important treatment target for this age group, given the ongoing neurocognitive development and changes in sleep architecture that occur during this period. Sleep carries less stigma than mental health difficulties and is easy to talk about with young people.

International cross-sectional research, longitudinal naturalistic field studies, controlled clinical trials, and qualitative retrospective inquiries from Australia, Singapore, Greece and the USA have investigated sleep disturbance during the ARMS period (Andriopoulos, 2011;

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Gourzis, 2002; Iyer, 2008; Miller, 2003; Poe, 2017; Tan, 2001; Yung, 1996). The results indicate that sleep disturbances are one of the most common experiences. Longitudinal studies have found that sleep disturbance is a prominent reason for young people with ARMS to seek help (Ruhrmann, 2010). A retrospective American cross-sectional study also found sleep disturbance preceding death in a sample of adolescent suicide completers with emerging mental ill health (n = 140, 13-19 years) (Goldstein, 2008). Sleep disturbance could therefore be viewed as a warning sign of both deteriorating mental health and suicide risk for adolescents.

In a single blind randomised controlled trial conducted in the UK with students experiencing insomnia (n = 3755), the authors reported that students were less likely to meet criteria for ARMS after treatment for sleep disturbance (Bradley, 2018). Treating sleep disturbance in this population could potentially contribute to preventing progression of mental ill health (Bradley, 2018). There is no direct evidence that sleep problems correlate specifically with negative academic outcomes in ARMS samples because this has not been a research focus in youth mental health literature. The education literature will now be reviewed to ascertain the evidence about sleep disturbance and academic performance.

Sleep disturbance and high school performance

Over thirty years of worldwide education research has provided strong evidence that sleep is vital for optimal levels of executive function required for learning and has a significant influence on academic functioning during adolescence (Curcio, 2006; Dewald, 2010; Diekelmann, 2010; Drummond, 2000; Fallone, 2002; Taras, 2015). Cross-sectional and

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longitudinal studies have examined self-reported sleep quality, sleep duration and sleepiness in large samples and found a significant relationship with school performance (Chung, 2008; Drake, 2003; Fredriksen, 2004; Gibson, 2006; Joo, 2005; Lazaratou, 2005; Mak, 2012; Meijer, 2004; O'Brian, 2005; Pagel, 2010; Wolfson, 2003). The findings indicate that shortened sleep time, erratic sleep/wake patterns, late bed and rise times and poor sleep quality are negatively associated with academic performance for adolescents throughout high school characterised by low grades and school drop out (Curcio, 2006; Fallone, 2002; Wolfson, 1998). These results have been consistently found in multiple cross-sectional studies in Australia, Sweden, Finland, Norway, South America, Europe and Asia (Chung, 2008; Hysing, 2016; Kronholm, 2015; Lazaratou, 2005; Perez-Chada, 2007; Stea, 2014; Titova, 2015; Yang, 2005).

Deterioration in functioning and ARMS

Functioning is defined as the frequency, quality of, and satisfaction with one's social, academic or occupational daily activity (Cotter, 2014). Poor functioning is one of the most consistently reported symptoms in ARMS samples and a major reason why young people present for help to services (Addington, 2017; Amminger, 2006; Cannon, 2008; Cornblatt, 2007, 2015; Fusar-Poli, 2013, 2014; Lemos-Giraldez, 2009; Nelson, 2013; Niedman, 2006, 2014; Ruhrmann, 2010; Schlosser, 2012; Thompson, 2011; Valmaggia, 2013; Velthorst, 2009; 2010; Yung, 2004; 2006). Neurodevelopmental processes are believed to contribute to the deterioration of functioning associated with ARMS (Cotter, 2014).

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There is an increasing body of evidence demonstrating that individuals with ARMS experience deficits in multiple cognitive domains (Barbata, 2013; Brewer, 2006; Fusar-Poli, 2012; Niendam, 2014). A meta-analysis investigated the extent of cognitive dysfunction in an ARMS group and found that deficits of attention, verbal fluency, visual and verbal memory, working memory, executive functioning and social cognition were present (Fusar-Poli, 2012). In another meta-analysis, Fusar-Poli and colleagues (2015) found that the ARMS group had a quality of life similar to individuals with established psychotic disorders due to impaired functioning. A systematic review also found that negative and disorganised symptoms contributed to poor functioning in individuals with ARMS (Cotter, 2014). Motivation, organisation and cognition are important for learning and academic participation therefore high school success is likely to be more difficult for individuals experiencing ARMS.

A need for care exists to enable these individuals to compensate for the cognitive impact of ARMS and successfully manage their practical, social, occupational and academic requirements. There is no research evidence demonstrating that poor functioning correlates specifically with negative academic outcomes in ARMS samples because it has not been researched before.

Depression, anxiety and ARMS

Up to 20% of young people will experience a depressive episode or anxiety disorder by the age of 18 years (Kessler, 2007; Lewinsohn, 1993; Merry, 2011). Early onset depression and anxiety is associated with substance use, suicide risk and poor academic achievement (Birmaher, 1996; Johnansson, 2013; Kessing, 2004; Rao, 1995).

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Undifferentiated depression and anxiety are clinical risk factors for moderate to severe mood and anxiety disorders as well as transition to psychosis (Amminger, 2006; Bockting, 2006; Wigman, 2012; Yung, 2004).

Cross-sectional, longitudinal, randomised control trials and follow up studies worldwide report a high prevalence of depression and anxiety in ARMS samples (Addington, 2017; Bechdolf, 2010; Brandizzi, 2015; Falkenberg, 2015; Fulford, 2013; Fusar-Poli, 2014; Hui, 2013; Kelleher, 2012; Lim, 2015; McAusland, 2017; Sakokangas, 2012; Velthorst, 2010; Woods, 2009). For example, an Australian follow up study (n = 226) reported that 90% of their ARMS sample had depression and anxiety (Lim, 2015). Suicidal ideation has also been found to be high (59%) (Hutton, 2011). In a multisite study examining the prevalence of anxiety specifically in an ARMS sample (765 ARMS individuals and 280 health controls), anxiety disorders were significantly more prevalent in those with ARMS when compared to healthy controls (McAusland, 2017). Fifty-one per cent had an anxiety disorder and social phobia was the most prevalent (McAusland, 2017). These results are consistent with other findings that social phobia is typically one of the most prevalent anxiety diagnoses in ARMS samples (Hui, 2013; McAusland, 2017; Meyer, 2014; Rietdijk, 2013; Rosen, 2006; Salokangas, 2012; Svirskis, 2005).

In a recent article, Davey and McGorry (2019) applied the clinical staging model to depression and identified that many young people will have subclinical depressive symptoms that don’t progress further. Others will have uncomplicated depression with comorbid anxiety (no suicidality), and others will have severe and complex depression that includes suicidal

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thoughts, poor psychosocial functioning and comorbid anxiety (Davey, 2019). The authors suggest that this is best managed in specialist youth mental health services, where expertise and support is available for them to recover.

There is no research demonstrating that depression and anxiety correlates specifically with negative academic outcomes in ARMS samples because this has not been a focus of previous research. The education literature will now be reviewed to ascertain the evidence about depression, anxiety and academic performance.

Depression, anxiety and high school performance

Adolescent depression and anxiety have been shown to negatively impact high school through poor grades and school drop out (Birmaher, 1996; Elmelid, 2015; Esch, 2014; Froyd, 2008; Garvik, 2014; Leach, 2012; Quiroga, 2013; Riglin, 2013; Van Amringen, 2003). Longitudinal studies have found that depression and anxiety at the beginning of a school year predicts poor grades at the end of the year (Frojd, 2008; Weldman, 2015). The Australian National Survey of Mental Health and Wellbeing data (n = 2055) found that depression and anxiety were significantly associated with disruption to the completion of Year 10 and high school dropout (Leach, 2012). A Canadian study (n = 493) found that depression in Year 7 predicted dropout within 6 years for over a third of high school students (Quiroga, 2013).

Several key symptoms of depression, such as impaired ability to concentrate, loss of interest, poor initiative, psychomotor retardation, low self-esteem, worthlessness and social withdrawal significantly reduce performance and initiative in learning (Esch, 2014; Frojd, 2008; Garvik, 2014; Quiroga, 2013). Depression results in students focusing on depressive

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thoughts and interpretations instead of the learning tasks (Frojd, 2008). Failures and negative feedback from teachers or peers further exacerbate feelings of hopelessness associated with depression (Birmaher, 1996; Garvik, 2014; Leach, 2012). Anxiety disorders, specifically social phobia and panic, are an important determinant for dropping out of school and academic underachievement (Davidson, 1993; Esch, 2014; Last, 1997; Van Ameringen, 2003; Weldman, 2015) (Table 4).

CLINICAL STAGING MODEL STAGE 1b – ATTENUATED PSYCHIATRIC SYNDROMES; ULTRA HIGH RISK; SUBTHRESHOLD PSYCHOSIS AND BIPOLAR AFFECTIVE DISORDER

Subthreshold psychosis

The ultra-high risk (UHR) for psychosis criteria created a paradigm for prediction research and subthreshold intervention and focuses on the identification of young people in the prodromal period of the disorder with the goal of delaying or preventing the onset of psychosis (FusarPoli, 2013; Yung, 1996, 2004). The Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM - 5) includes attenuated psychosis syndrome (APS) in Section III under “conditions for further study” (APA, 2013). Attenuated psychosis is a condition applied to young people showing their first (thus weak or attenuated) psychotic symptoms. Symptoms include hearing voices, disordered thinking, paranoia and social withdrawal that could, if left untreated, lead to schizophrenia or bipolar disorder.

Based on the evidence, the clinical staging model in psychosis comprises Stage 0 (family history of mental illness, history of childhood trauma), Stage 1a (sleep disturbance, deterioration in functioning, undifferentiated anxiety and depression) and Stage 1b (subthreshold or attenuated psychosis syndrome) (Addington, 2007, 2012; Cannon, 2008;

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Fusar-Poli, 2013, 2014; McGorry, 2018; Nelson, 2013; Ruhrmann, 2010;). Clinical predictors for progression to FEP (Stage 2) include persisting attenuated psychotic symptoms such as thought disorder, conceptual disorganisation, and unusual thought content such as paranoid thoughts, and poor functioning as well as negative symptoms (Addington, 2007, 2012, 2015; Amminger, 2006; Cannon, 2008 Cornblatt, 2015; Demjaha, 2012; Klosterkotter, 2001; Lemos-Giraldez, 2009; Schlosser, 2012; Thompson, 2011; Valmaggia, 2013; Velthorst, 2009; Yung, 1996, 2004; Ziermans, 2014).

In an English survey study with 130 secondary school teachers, Collins and colleagues (2008) investigated high school teachers' knowledge of FEP and their views about their role in early detection. The authors found that almost a third of the sample had experienced a student with possible symptoms of psychosis but most teachers were unsure about their role and who had the responsibility to help, how to help and where to refer them. An Italian study with high school teachers (n = 268) found similar results (Masillo, 2012). Further, in a Norwegian cross sectional study (n = 441), access to a school youth mental health outreach team for early detection and treatment of psychosis demonstrated that this increased confidence for teachers in recognising and supporting students (Langeveld, 2011). The evidence shows that in order to recognise early symptoms of psychosis, teachers require youth mental health support structures and knowledge of the available resources. The education literature will now be discussed.

Subthreshold psychosis and high school performance

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There is no research in education about the impact of psychosis and school performance. This may be because students have already dropped out or school staff mistake symptoms of emerging psychosis for depression and anxiety or substance use. However, in Waghorn's Australian analysis of the data from the second national survey with individuals experiencing psychosis (n = 1825) (2012), 68% of the sample had not finished high school (2012). Having no high school qualification was more common in those with schizophrenia (36.6%) or schizoaffective disorder (36.8%) compared with bipolar affective disorder (27.6%). Differences in educational attainment were statistically significant ($p = 0.0004$). These results were a lot worse than the previous national psychosis survey in 1999 when 47.8% of the sample had not completed high school. The evidence indicates that subthreshold psychosis is not identified early in high school and consequently contributes considerably to the global economic burden of schizophrenia and psychotic disorders.

Subthreshold bipolar affective disorder (BPAD)

Bipolar affective disorder (BPAD) is one of most burdensome conditions in young people aged under 25 years with a peak age at onset of between 15 and 25 years (Gore, 2011; Kessler, 2007). Research suggests that young people with BPAD experience functional impairments early in the illness with high rates of NEET present (Alonso, 2011; Cross, 2017; Dean, 2004; Gilbert, 2013; Goldstein, 2009; Grande, 2013; Hirschfeld, 2003; Jansen, 2012; Judd, 2008; Kaur-Sant'Anna, 2009; Morriss, 2013; Simon, 2007, 2008; Tickell, 2019). The social and economic consequences of BPAD have reinforced the need to promote effective interventions in the earliest phases of illness (Balazs, 2013; McGorry, 2006; Scott, 2012; Scott, 2013).

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International evidence indicates that individuals at high risk of developing BPAD (Stage 2) often report depressive, hypomanic or psychotic-like presentations in the months or even years prior to the first episode that meets full diagnostic criteria for the illness (Berk, 2014; Kapczinski, 2014; Scott, 2013). Retrospective studies demonstrate that symptom onset occurs during adolescence with several depressive episodes preceding the first hypomanic episode (Beesdo, 2009; Frankland, 2018; Kupfer, 2002). Studies have found that sleep disturbance, anxiety and depression, mood lability, disruptive behaviour, and irritability can also precede the onset of subthreshold hypomanic symptoms (Axelson, 2015; Egeland, 2000; Hafeman, 2016; Hauser, 2013; Mesman, 2017).

In terms of clinical staging, the identified risk markers of BPAD are having a family history of mental illness, a history of trauma (Stage 0); sleep disturbance, poor psychosocial functioning, undifferentiated anxiety and depression, (Stage 1a); followed by moderate depressive symptoms, mood lability and irritability leading to a subthreshold hypomanic episode (Stage 1b), (Berk, 2014; Duffy, 2010, 2014; Hartmann, 2018; Kapczinski, 2014; Scott, 2013).

Subthreshold BPAD and high school performance

There is no research in the education literature about the impact of BPAD on school performance. This may be due to teachers' lack of awareness of subthreshold hypomanic symptoms, or mistaking mood lability and irritability as behavioural, or related specifically to substance use. There is no clear and consistent data reporting the high school success rates of young people experiencing BPAD in the mental health literature. There is evidence that

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neuropsychological changes such as difficulties in mental flexibility (Hermans, 2011), attention (Thompson, 2005), memory (Thompson, 2005) and executive functioning (Sweeney, 2000), accompany the first episode BPAD, all of which would negatively impact school performance (Lin, 2013).

Some international studies report that they young people with BPAD more likely to complete high school than those experiencing psychosis (MacCade, 2010; Vreeker, 2016). Others report significantly poor high school performance (Dean 2004; Grande, 2013; Scott, 2014). International mental health research demonstrates that following a first episode of BPAD (Stage 2), functional recovery is difficult to obtain and is only achieved by approximately a third of individuals (Dion, 1988; Tohen, 2000; Scott, 2014). In a cross sectional study (n = 1241), 36% of the sample were receiving government financial support due to vocational inactivity and serious impairments in functioning (Scott, 2014). It is suggested that school dropout may frequently occur but is not consistently recorded in research. Waghorn (2012) reported in the second national survey with individuals experiencing psychosis (n = 1825) that of the 68% that had not finished school, 27.6% had BPAD. It is clear from the research that clinical improvement in BPAD is not necessarily associated with functional recovery. Please see Table 5 for the key findings related to Clinical Stage 1b.

DISCUSSION

Untreated mental ill health is the major cause of high school dropout and risk factor for NEET. There is little acknowledgement in the youth mental health literature about

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emerging mental ill health, the Clinical Staging Model and the academic success of young people. There is however evidence in the education literature about the student characteristics that negatively impact high school participation and achievement, and this study demonstrated that these correspond to the characteristics of Clinical Staging Model, specifically Stages 0 and 1a.

It is argued that the school environment offers unparalleled access to young people in a familiar environment (Masia-Warneret, 2006). School based mental health services integrated into the school life could alleviate many barriers to accessing treatment for young people and promote early identification and intervention (Barrett, 2006). The education evidence shows that the risk markers for emerging mental ill health can have a negative impact on a student's ability to engage, participate and succeed both academically and socially in high school. Teachers are not supposed to be mental health clinicians, but it is evident from the literature that they can already identify the characteristics consistent with Stage 0 and 1a of the Clinical Staging Model. Stage 1b subthreshold states are however more difficult for teachers to recognise and consequently are not included in the education literature. It may be easier and less stigmatising for school personnel to ascertain if a student is experiencing poor sleep and having trouble with their functioning than to ask about attenuated psychotic symptoms. This evidence should be capitalised upon. Once a student is identified by a teacher as experiencing risk markers, then clear referral protocols need to be embedded into school life.

Headspace is the Australian Government's major investment in youth mental health (Rickwood, 2013). Headspace centres are youth- friendly and provide evidence based

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interventions and support to young people experiencing mental ill health (Rickwood, 2018). Young people accessing headspace report high levels of satisfaction with the service provided (Rickwood, 2015). Research has demonstrated that headspace support can improve psychological distress and/or social and occupational functioning (Rickwood, 2015). It is however largely office or centre-based operating in the hours when students should be in school. It needs to expand into the community with outreach and mobile care to effectively service the need. Rural areas are particularly in need, where access to services is limited by long wait lists for help, the need to travel to access help but limited public transport exists (Bowman, 2017). Headspace school mobile outreach teams consisting of youth mental health clinicians, and psychiatrists should provide onsite school support, early intervention and treatment to prevent illness progression, promote recovery and achievement of academic goals. This could genuinely reduce the risk of young people prematurely dropping out due to their mental ill health and lead to better educational and social outcomes.

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