



## Alexithymic traits, independent of depression and anxiety, are associated with reduced sleep quality

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### ABSTRACT

Disrupted sleep is a transdiagnostic factor characterising a multitude of psychiatric conditions. Although this is well-recognised, the cause of poor sleep across conditions is unclear. One possibility is that poor sleep is driven by traits which also co-occur with multiple conditions. Previous research suggests that alexithymia (an inability to identify and describe one's emotions) is a candidate trait, as it is linked to poor sleep quality and elevated levels of alexithymia are seen across multiple diagnostic groups. The association between alexithymia and poor sleep quality has been questioned however, with studies arguing that it is depression and anxiety, rather than alexithymia, which impact sleep quality. Problematically, such studies typically utilise measures of depression and anxiety which include items relating to sleep – meaning that apparent associations between depression and anxiety may be due to measurement issues, rather than to depression and anxiety per se. Study 1 confirmed the relationship between alexithymia and subjective sleep quality, whilst Study 2 utilised an independent sample to replicate the association between alexithymia and sleep quality, and to demonstrate that it is not a product of co-occurring depression or anxiety. Results therefore support the suggestion that alexithymia may explain disrupted sleep across multiple psychiatric conditions.

### 1. Introduction

Poor sleep quality is reported across multiple psychiatric conditions (e.g., Freeman et al., 2017) including depression (see Tsuno, Besset, & Ritchie, 2005) and certain subtypes of anxiety disorders (see Papadimitriou & Linkowski, 2005). Given the importance of sleep for wellbeing (Freeman et al., 2017), identifying factors responsible for poor sleep across the disorders in which it is experienced is an important research aim. In recent years there has been a growing appreciation that transdiagnostic symptoms, including poor sleep, may be explained by traits that co-occur with multiple disorders, rather than by the disorders themselves. In particular, the contribution of alexithymia, a sub-clinical condition characterised by difficulties identifying and describing one's own emotions and an externally orientated thinking style, has begun to be appreciated (Sifneos, 1973). Alexithymic individuals often exhibit poor emotional functioning in a number of domains outside their defining inability to identify and describe their own emotions, including emotion recognition (Brewer, Cook, Cardi, Treasure, & Bird, 2015; Cook, Brewer, Shah, & Bird, 2013; Grynberg

et al., 2012; Heaton et al., 2012) and empathy (Bird et al., 2010). Perhaps as a consequence, individuals with alexithymia also experience problems with interpersonal relationships and exhibit increased rates of mental and physical ill-health (Taylor, Bagby, & Parker, 1999). Importantly, increased rates of alexithymia are observed across many psychiatric conditions (e.g., Brewer, Cook, & Bird, 2016; Murphy, Brewer, Catmur, & Bird, 2017), and alexithymia has been demonstrated to be responsible for a range of symptoms across these conditions (e.g., Brewer et al., 2015; Cook et al., 2013).

With respect to sleep, previous studies have identified an association between alexithymia and poor sleep quality using both subjective (e.g., Bauermann, Parker, & Taylor, 2008) and objective measures of sleep quality (e.g., Bazyldo, Lumley, & Roehrs, 2001). For example, using subjective measures alexithymia has been associated with sleep-related problems in community samples (e.g., Bauermann et al., 2008; Hyypä, Lindholm, Kronholm, & Lehtinen, 1990) as well as in clinical groups such as men with depression (e.g., Honkalampi, Saarinen, Hintikka, Virtanen, & Viinamäki, 1999) and individuals with depression (e.g., Aydın, Ozdemir, & Selvi, 2012); and rates of alexithymia are reported to

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be higher in those with insomnia (e.g., Engin, Keskin, Dulgerler, & Bilge, 2010). Whilst few studies have employed objective measures, there are also reports that alexithymia is associated with increased light sleep (Bazydło et al., 2001; but see De Gennaro et al., 2002). Furthermore, recent evidence links alexithymia to atypical interoception (perception of one's internal bodily state; Brewer et al., 2016; Herbert, Herbert, & Pollatos, 2011; Shah, Hall, Catmur, & Bird, 2016; Murphy, Catmur, & Bird, 2018), and poor interoception has also been linked to poor self-reported sleep quality in clinical conditions (Ewing et al., 2017). These studies are therefore consistent with the proposal that heightened levels of alexithymia may confer risk of disrupted sleep.

Although a body of evidence links alexithymia to poor sleep, it should be acknowledged that individuals with higher levels of alexithymia are more likely to report increased symptoms of depression and anxiety (e.g., Hendryx, Haviland, & Shaw, 1991; Honkalampi, Hintikka, Tanskanen, Lehtonen, & Viinamäki, 2000), which have both been associated with poor sleep (see Tsuno et al., 2005; Papadimitriou, & Linkowski, 2005). As a consequence, it is possible that it is depression or anxiety, and not alexithymia, that is responsible for poor sleep quality. Indeed, previous studies examining the specific contribution of alexithymia, depression and anxiety to poor sleep quality have produced mixed results, with some studies suggesting that the relationship between alexithymia and sleep disturbance is driven by anxiety (Lundh & Broman, 2006; with anxiety quantified using the Karolinska Scales of Personality; KSP; Gustavsson, Weinryb, Göransson, Pedersen, & Åsberg, 1997) or depression (De Gennaro, Martina, Curcio, & Ferrara, 2004; with depression assessed using the Center for Epidemiological Studies Depression scale; CES-D; Radloff, 1977), and some not (Kronholm, Partonen, Salminen, Mattila, & Joukamaa, 2008; with depression assessed using the Beck Depression Inventory; BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). Problematically, however, many measures of depression and anxiety include items relating to sleep, and all of the previous studies investigating the relationship between alexithymia, anxiety, depression and sleep have utilised measures that include items assessing sleep. For example, the most commonly used measure of depressive traits, the BDI (Beck et al., 1961) includes items relating to both sleep (e.g., “I don't sleep as well as I used to”) and tiredness (e.g., “I get tired more easily than I used to”). The same is true for other routinely-used measures such as the CES-D (Radloff, 1977) which also includes items relating to sleep (e.g., “My sleep was restless”); and measures of anxiety that include items relating to tiredness (e.g., “Quite often, especially when I am tired, I get the feeling that either I or the world around me is changing - a feeling of unreality”; KSP; Gustavsson et al., 1997). The association between depression and anxiety and sleep, and whether anxiety and depression are responsible for the association between alexithymia and sleep quality, may therefore depend on the degree to which items relating to sleep contribute to assessment of depression and anxiety on a particular measure. Specifically, studies utilising depression or anxiety measures that have a greater focus on sleep quality than other measures may inflate relationships between anxiety, depression and sleep, which in turn obscure, or reduce, associations between alexithymia and sleep quality (De Gennaro et al., 2004; Kronholm et al., 2008; Lundh & Broman, 2006). The degree to which the association between alexithymia and sleep quality is suppressed will, in turn, depend on the proportion of individuals in a particular sample with co-occurring clinical symptoms and sleep problems. These factors make it very difficult to determine whether alexithymia contributes to poor sleep quality independent of its relationship with depression and anxiety when measures of depression and anxiety are utilised that include items relating to sleep.

Consequently, the aim of the present set of studies was to 1) confirm the relationship between alexithymia and poor sleep quality and 2) examine whether these associations are driven by anxiety or depression using measures which do not include items that assess sleep quality.

## 2. Study 1

### 2.1. Participants

Participants were recruited via pre-existing databases of individuals who had indicated an interest in taking part in psychological research and via social media advertisements. Participants were informed that the study aimed to investigate links between emotional and bodily awareness, and physical health. 86 participants took part in Study 1. Of these, 70 participants fully completed the questionnaires, had English as their first language and identified their gender as male or female ( $M_{\text{age}} = 42.93$ ,  $SD_{\text{age}} = 21.80$ , range 18–91, 26 Males) and were included in analyses. 13.95% were removed as they had English as their second language, 3.49% were removed for a failure to complete all measures and 1.16% were removed as they identified as a non-binary gender. Ethical approval was granted by the local ethics committee, all participants gave informed consent, and were fully debriefed upon completion.

### 2.2. Method

Participants completed the Toronto Alexithymia Scale (TAS-20; Bagby, Parker, & Taylor, 1994) and the Pittsburgh Sleep Quality Index (PSQI; Buysse, Reynolds, Monk, Berman, & Kupfer, 1989) in a randomised order online via Qualtrics (Provo, UT). High scores on these measures indicate elevated alexithymic traits and poor sleep quality, respectively. The TAS-20 is comprised of three subscales, difficulties describing feelings, difficulties identifying feelings and externally orientated thinking.

## 3. Results

Where directional predictions are made, one-tailed tests are utilised. Alexithymia scores ranged from 21 to 79 ( $M = 46.90$ ,  $SD = 13.55$ ). As predicted, total alexithymia scores were associated with reduced sleep quality ( $r(68) = 0.462$ ,  $p < .001$ ; one-tailed). Analysis of the TAS-20 sub-factors indicated a significant association between reduced sleep quality and each sub-factor (all  $p < .006$ ; one-tailed).

As the relationship between alexithymia and sleep quality may vary across genders (e.g., Honkalampi et al., 1999; Kronholm et al., 2008), and levels of alexithymia have been reported to vary across the lifespan (e.g., Mattila, Salminen, Nummi, & Joukamaa, 2006), additional analyses were conducted controlling for these variables. Regression analyses predicting sleep quality from age (years), gender (0 = female, 1 = male) and alexithymia total scores suggested that both alexithymia (standardised  $\beta = 0.534$ ,  $t = 4.903$ ,  $p < .001$ ; one-tailed) and age (standardised  $\beta = 0.265$ ,  $t = 2.408$ ,  $p < .010$ ; one-tailed) were predictive of poor sleep quality and the overall model was significant ( $F(3,66) = 8.420$ ,  $p < .001$ ).

To uncover whether the relationship between alexithymia and sleep varied as a function of gender, the regression analysis was re-run including the interaction term between gender ( $-1 = \text{female}$ , and  $1 = \text{male}$ ) and mean-centred alexithymia scores. The interaction term did not predict sleep quality (standardised  $\beta = 0.154$ ,  $t = 1.302$ ,  $p > .05$ ; two-tailed).

## 4. Study 2

Having confirmed an association between alexithymia and poor sleep quality, the aim of Study 2 was to determine whether this association was driven by depression or anxiety using measures which do not include items relating to sleep quality.

### 4.1. Participants

A power analysis using the effect size observed in Study 1 for the

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