Diligent and disagreeable? The influence of personality on continuous positive airway pressure (CPAP) adherence for obstructive sleep apnea

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ABSTRACT
CPAP is an effective treatment for obstructive sleep apnea (OSA), though low adherence rates limit its benefits. Previous research has linked personality to a range of health behaviours including CPAP adherence. In keeping with these findings it was hypothesised that CPAP adherence would be positively correlated with conscientiousness and negatively correlated with emotionality. The present study also tested for an interaction between conscientiousness and emotionality as well as investigating the relationship between personality facets and adherence.

Participants were 110 adults, diagnosed with OSA. After approximately one month’s treatment, average nightly usage for the previous week was downloaded from the CPAP device. Participants also completed the HEXACO Personality Inventory – revised. Contrary to expectation, there was no significant relationship between CPAP adherence and conscientiousness or emotionality and no significant interaction. However, the diligence facet of conscientiousness showed a significant positive correlation with CPAP adherence ($r = .23, p < .05$). Unanticipated negative correlations were also found between CPAP adherence and agreeableness and two of its facets: gentleness ($r = -.33, p < .01$) and patience ($r = -.22, p < .05$).

The results provide support for an association between CPAP adherence and personality. It is recommended that future research focus on facet level measurement, in particular the personality facets associated with conscientiousness and agreeableness.

1. Introduction

Obstructive sleep apnea (OSA) is a chronic disorder characterised by repeated complete or partial collapse of the upper airway during sleep (Epstein et al., 2009). Disease severity is rated using the number of these respiratory events per hour (apnea-hypopnea index; AHI), and is categorised as mild, moderate or severe at AHI levels of $\geq 5$, $\geq 15$, and $\geq 30$ events per hour of sleep respectively (Berry et al., 2012). The problem is global, with prevalence rates reported in Europe, the USA and Asia averaging 17% in women (range 4–50%) and 22% in men (range 9–37%) (Franklin and Lindberg, 2015). Major risk factors for OSA include male gender, age and obesity (Franklin and Lindberg, 2015). Increasing prevalence rates over time have been attributed to the rise in obesity, and different techniques and definitions for scoring (Franklin and Lindberg, 2015). Understanding of the pathophysiology of OSA has recently increased, with four contributing factors, or OSA phenotypes, identified— in addition to an upper airway which is anatomically susceptible to collapse, non-anatomic factors are reduced activity of the pharyngeal dilator muscles, changes in arousal threshold, and changes in ventilatory control (Osman et al., 2018). OSA is associated with a number of adverse outcomes including increased risk of motor vehicle and workplace accidents, cognitive impairment, decreased quality of life, depression and anxiety, increased risk of health problems including cardiovascular disease and metabolic disease, as well as an overall increased risk of mortality (Morsy et al., 2019).

To treat OSA, continuous positive airway pressure therapy (CPAP), which keeps the airway open at night via a pneumatic splint applied by delivering air at a fixed pressure through a nasal or oronasal mask, is currently recommended treatment for all levels of severity (Epstein et al., 2009). Use for four hours per night on 70% of nights was considered adequate based on early research, however a dose-response relationship between CPAP adherence and some health outcomes suggests that the
While CPAP is considered to be a highly cost-effective treatment, a significant proportion of sleep apnea patients do not adequately adhere to treatment, limiting its potential benefits. When adherence is defined as usage of the device for at least an average of four hours a night, 29% to as many as 83% of patients have been shown to be non-adherent (Weaver, 2013). Factors contributing to poor adherence, include biomedical factors such as difficulty in adjusting to using a machine and wearing headgear at night, while nasal obstruction may decrease adherence in the early stages of treatment (Crawford et al., 2014). Amongst psychological variables attention has focused on co-morbid mental health factors such as claustrophobia, insomnia and depression, each of which has been associated with lower adherence (Crawford et al., 2014). The potential influence of personality factors on CPAP adherence has received scant attention in the literature. This is despite numerous studies linking personality to engagement in a range of health-damaging (e.g., eating too much fat, excessive alcohol consumption) and health-enhancing (e.g., regular exercise, adhering to medical advice) behaviours (Bogg and Roberts, 2004). The existing literature to be reviewed will focus on the role of personality factors and in particular the potential relevance of conscientiousness and neuroticism to CPAP adherence.

Contemporary personality taxonomies, based on factor analysis, utilise a hierarchical approach in which inter-correlated narrow traits or “factors” give rise to a smaller number of higher order dimensions or domains of personality (Eysenck and Eysenck, 1985). While factor analysis has been a useful tool for clarifying the structure of human personality, it is yet to produce firm consensus around the exact number and nature of these higher order personality dimensions (Zuckerman, 2005). Currently, the most popular dimensional taxonomy is Costa and McCrae (1995) five factor model (FFM), which comprises the personality dimensions of openness to experience, conscientiousness, extraversion, agreeableness and neuroticism (or emotionality). In addition to this FFM, a six-factor solution called the HEXACO model (Lee and Ashton, 2008), has emerged from lexical studies across a number of different languages. Five of the 6 HEXACO dimensions represent variants of Costa and McCrae’s FFM. However, the sixth HEXACO factor, Honesty-Humility, has no direct counterpart. The HEXACO six-factor structure has been shown to have incremental validity for predicting a range of criterion measures, beyond that offered by Costa and McCrae’s FFM (e.g., De Vries et al., 2009).

The personality dimension that has received the most attention in the health psychology literature is conscientiousness. This personality dimension is defined by both proactive personality facets (e.g., industriousness and achievement striving) as well as more inhibitive facets (e.g., self-control and prudence) (Costa et al., 1991). The focus on conscientiousness within the health psychology literature can be traced back to prospective research by Friedman and associates (e.g., Friedman and Martin, 2011) which found that conscientiousness was the best personality predictor of longevity. Meta-analysis has subsequently reinforced the importance of conscientiousness as a predictor of all-cause mortality (Jokela et al., 2013). The association between conscientiousness and mortality is thought to be mediated by health behaviours. A meta-analysis of 194 studies by Bogg and Roberts (2004), found that conscientiousness and its various facets were associated with fewer risky health behaviours including: illicit drug use, excessive alcohol consumption, violence, risky driving, tobacco use, risky sex and unhealthy eating. Bogg and Roberts (2004) note that conscientiousness are likely to be relevant to different health behaviours – industriousness for instance was found to have the strongest association with physical activity while responsibility and self-control were more prominent for drug use. Conscientiousness is also the personality dimension most frequently related to medication adherence. A meta-analysis conducted by Molloy et al. (2014) concluded that conscientiousness had a small, positive effect on medication adherence ($r = .15$), with the association being stronger in younger samples ($r = .26$). While the effect size is modest, conscientiousness may have a stronger effect on CPAP adherence than on medication adherence, as CPAP adherence is a more difficult behaviour to maintain (Sampaio et al., 2013).

Neuroticism or emotionality is defined by personality facets associated with negative affect (e.g., fearfulness and anxiety) (Eysenck and Eysenck, 1985). Neurotic individuals are thought to appraise neutral or ambiguous situations as being more threatening and less manageable and adopt less effective coping strategies in the face of environmental demand (e.g., Schneider, 2004). On this basis it was assumed by many that neurotic individuals would tend to exhibit unhealthier behaviours - in some cases as maladaptive coping strategies (McCrae and Costa, 1986). In keeping with this view, neuroticism has been associated with physical inactivity (e.g., Courneya and Hellsten, 1998), poor sleep hygiene and sleep quality (e.g., Duggan et al., 2014) and being overweight (e.g., Hampson et al., 2006). Neuroticism has also been shown to be positively correlated with medication non-adherence in a number of studies (e.g., Jerant et al., 2011; Axelsson et al., 2011). For other health behaviours though, the findings tend to be mixed. For instance, there is no consistent evidence linking neuroticism to risky health behaviours such as excessive alcohol consumption, and cigarette smoking (Torgersen and Vollrath, 2006).

To complicate matters further, it has been suggested that under some circumstances neuroticism may actually be a protective factor. Friedman and Kern (2014) for example describe “healthy neuroticism”, whereby a person high in neuroticism may worry more, but be more careful with their health. In keeping with this view, Johnson (2000) found neuroticism to be positively correlated with both the perceived risk of HIV infection and protection-related motivations for wanting to join an HIV vaccine trial. It has also been suggested that conscientiousness may moderate the relationship between neuroticism and health behaviours. Torgersen and Vollrath (2006) found that amongst those low in conscientiousness, high neuroticism was a risk factor for a number of poor health behaviours including excessive alcohol use, drug abuse, and cigarette smoking. However, these authors report that for some risky health behaviours at least (e.g. drug abuse), high conscientiousness acts as a protective factor for those high in neuroticism. Given the complex nature of research findings linking personality to health behaviours, Friedman and Kern (2014) suggest that researchers should consider both facet level measurement as well as interactions between the personality dimensions, particularly conscientiousness and neuroticism.

Two studies have looked at CPAP adherence using the FFM of personality. Moran et al. (2011), used a 20-item measure called the Mini-IPIP (Donnellan et al., 2006). The study comprised 63 participants (32 females and 31 males), with CPAP adherence dichotomised using a criterion of 4 or more hours per night on 70% of nights. Out of the five personality dimensions, only neuroticism was found to be significantly correlated ($r = .296, p = .043$) with the dichotomised CPAP adherence measure: participants higher in neuroticism where less likely to be adherent. Amongst those classified as adherent with CPAP therapy (61.9% of participants), only conscientiousness ($r = .377, p = .022$) and Intellect (a dimension that overlaps with openness to experience) ($r = .458, p = .004$) showed significant correlations with CPAP usage. One potential limitation of this study is the use of the abbreviated five factor measure – the Mini-IPIP. Internal consistency estimates for the neuroticism (alpha = .68) and conscientiousness (alpha = .69) scales were markedly lower than for the longer 50 item version of the IPIP (Donnellan et al., 2006). Also items on the Mini-IPIP conscientiousness scale are weighted to the facet of orderliness (MacCann et al., 2009), which is likely to be less relevant to CPAP adherence than other conscientiousness related facets such as self-discipline and self-efficacy.

The other study to have utilised a five-factor model in research on CPAP adherence is a study by Wallace et al. (2013). These researchers administered the 44-item Big Five Inventory (John et al., 1991) to 59 male Hispanic veterans. Participants were classified as CPAP adherent (41%) using the criteria of CPAP ≥4h daily during the first 30 days of
treatment. There were no significant differences between the adherent group and non-adherent group for any of the five personality dimensions. The sample size used in this study though was quite small and may not have had sufficient power to detect personality related effects.

Using a cross-sectional design, the aim of the present study is to investigate the relationship between personality and adherence to CPAP therapy in sleep apnea patients. It is hypothesised that conscientiousness will be positively correlated with CPAP adherence while neuroticism or emotionality will be negatively correlated with CPAP adherence. In line with Friedman and Kern’s (2014) recommendations the study will also investigate the relationship between CPAP adherence and the facets that define conscientiousness and emotionality; as well as test for a possible interaction between conscientiousness and emotionality.

2. Method

2.1. Participants

Participants were recruited over a three-month period through an advertisement placed at the reception desk of a Canberra sleep clinic. Eligible participants met the following inclusion criteria: not currently hospitalised; a diagnosis of OSA after overnight polysomnogram (PSG) and recommendation of a trial of CPAP therapy by one of the sleep clinic physicians; use of the CPAP equipment for a period of between two weeks and two months after in-laboratory CPAP titration PSG; and no prior use of CPAP. Most participants attended an in-laboratory diagnostic PSG; a few may have undergone an at-home PSG as information regarding type of CPAP. Most participants attended an in-laboratory diagnostic PSG; and no prior use of CPAP. Most participants attended an in-laboratory diagnostic PSG; a few may have undergone an at-home PSG as information regarding type of study was not collected. Two weeks and two months represented the typical timeframe for initial review of therapy. Patients were fitted with a mask and educated regarding care and use of CPAP equipment on their titration study night.

A total of 110 participants aged between 19 and 84 years of age (mean age = 58.28; SD = 14.61) met criteria and returned completed forms. In terms of gender break down there were 67 males (mean age = 57.40, SD = 15.36) and 43 females (mean age = 59.65, SD = 13.40). All participants gave informed consent. Ethics approval was granted by Charles Sturt University Human Research Ethics Committee.

2.2. Personality measure

The HEXACO-PI-R is a 100-item, self-report personality questionnaire (Lee and Ashton, 2008). It utilises a five-point Likert response scale, rated from 1 = “strongly disagree” to 5 = “strongly agree” and assesses six personality dimensions: Honesty-humility, Emotionality, Extraversion, Agreeableness, Conscientiousness and Openness. Dimensional scores were calculated by summing the relevant dimensional items and then dividing by 16 to get a score out of 5. Each dimension is defined by four, four-item facet-level traits, and there is an interstitial Altruism facet. Facet scores are calculated by summing the relevant facet items and dividing by 4 to get a score out of 5. In the present study, internal consistency estimates for the six HEXACO-PI-R personality dimensions were all acceptable, with Cronbach alpha values ranging between .75 for emotionality and .85 for extraversion, agreeableness and openness. Reliability tended to be lower for the shorter facet level scales, with Cronbach alpha values ranging from a low of .49 for the sincerity facet of honesty-humility up to a high of .81 for the inquisitiveness facet of openness. The conscientiousness and emotionality facets were a particular focus in the present study. Reliabilities for these facets ranged from a high of .71 for the diligence facet of conscientiousness to a low of .54 for the anxiety facet of emotionality.

2.3. CPAP adherence

CPAP usage data was taken as the average number of minutes used per night, over approximately one week prior to the review appointment. Data was downloaded from the secure data (SD) card of the patients’ CPAP, auto-titrating or bi-level positive airway pressure (PAP) machines, to provide an objective measure of use.

2.4. Procedure

A flyer containing information about the study was handed out by reception staff to patients attending a review appointment, and patients expressing interest in participating were given an information sheet, consent form, and numbered paper copy of the HEXACO-PI-R to complete. CPAP usage data was collected from the secure data card of the patients’ PAP machines during their clinic visit.

3. Results

To examine the relationship between CPAP adherence and personality variables, bivariate correlational analyses and multiple regression analyses were performed. Prior to carrying out these analyses the data was inspected and found to meet all standard statistical assumptions (Cohen et al., 2003).

Table 1 provides means, standard deviations (SD) and bivariate correlations for demographic variables, the HEXACO-PI-R personality dimensions and CPAP adherence. Counter to expectation CPAP adherence was not significantly correlated with either conscientiousness (r = -.098, p = .31) or emotionality (r = .006, p = .95). There was however a modest negative correlation between CPAP adherence and agreeableness (r = -.224, p < .05). Furthermore, the relationship between adherence and agreeableness remained significant after controlling for age and gender in multiple regression analysis (sr = -.208, p < .05).

Drilling down to the facet level, the bivariate correlations between CPAP adherence and conscientiousness facets are presented in Table 2. Due to the variability in reliability at the facet level, values for Cronbach’s alpha are also included with the correlation matrix. The facet of diligence showed a significant positive correlation with CPAP adherence (r = .228, p < .05). As might be expected, adherence tended to increase with greater diligence. Furthermore, this relationship remained significant after controlling for age and gender in multiple regression analysis (sr = .240, p < .05). The remaining conscientiousness facets were not significantly correlated with CPAP adherence. An examination of the correlations between emotionality facets and CPAP adherence revealed no significant associations (see Table 3).

While a relationship between CPAP adherence and agreeableness was not hypothesised, the significant negative correlation found between these two variables, prompted further post hoc exploration at the facet level. Correlations between CPAP adherence and agreeableness facets are presented in Table 4. CPAP adherence showed a significant negative correlation with two agreeableness facets: gentleness (r = -.327, p < .01) and patience (r = -.218, p < .05). Furthermore, both gentleness (sr = -.307, p < .001) and patience (sr = -.203, p < .05) remained significant predictors of CPAP adherence after controlling for age and gender in multiple regression.

Finally, in order to test for an interaction between conscientiousness and emotionality a hierarchical regression analysis was conducted. In the first step CPAP adherence was regressed on the demographic variables of gender and age. In the second step, conscientiousness and emotionality were entered. In the third step, the interaction between conscientiousness and emotionality was entered. To avoid issues associated with non-essential multi-collinearity (Cohen et al., 2003), conscientiousness and emotionality were centred before being employed in the regression analysis. No significant effects were found at any of the three steps in this hierarchical regression.

4. Discussion

The aim of the present study was to investigate whether personality factors can predict CPAP adherence in obstructive sleep apnea patients. After reviewing the literature on personality and health behaviours it was...
hypothesised that conscientiousness would show a positive association with CPAP adherence, and emotionality would show a negative association with CPAP adherence. Neither of these hypotheses were supported in the present study. Conscientiousness (r = .098, p = .31) and emotionality (r = .006, p = .95) both showed trivial and non-significant bivariate associations with CPAP adherence.

Given the complex nature of findings linking personality to health behaviours, the current research adopted Friedman and Kern (2014) recommendation to consider facet level measures of conscientiousness and emotionality as well as the interaction between these two personality dimensions. At the facet level only the conscientiousness facet of diligence showed a significant correlation with CPAP adherence (r = .228, p < .05). This association remained significant after controlling for age and gender in multiple regression analysis (sr = .240, p < .05). Lee and Ashton (2008) associated high scores on diligence with a tendency to be hard working, self-disciplined and motivated to achieve. A link between diligence/self-discipline and health behaviours is supported by research conducted around the FFM of personality. Costa et al. (2014) found that self-discipline is the conscientiousness facet that is most strongly associated with survival over 8 years in an elderly cohort, with the authors noting that people higher in self-discipline have the motivation to begin tasks and see them through. The final hypothesis, that there would be a significant interaction of conscientiousness and emotionality in predicting CPAP adherence, was not supported.

Although it was not hypothesised, the present study found a significant negative association between the personality dimension of agreeableness and CPAP adherence (r = -.224, p = .025). This negative correlation was found to hold up after controlling for age and gender in

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Table 1. Descriptive statistics and correlation coefficients for demographic variables, HEXACO personality dimensions and CPAP Adherence (CPAPAD).

| Variable   | Mean (SD) | H | E | eX | A | C | O | Age | Gender |
|------------|-----------|---|---|----|---|---|---|-----|--------|
| CPAPAD     | 3.45 (0.135) | .074 | .006 | .222 | -.224* | .098 | -.017 | -.134 | -.001 |
| H          | 3.73 (0.47) | .014 | .186 | - .236* | .275** | - .214* | .119 | .151 |
| E          | 3.15 (0.47) | -.142 | -.094 | - .058 | -.181 | -.070 | .502** |
| eX         | 3.34 (0.56) | -.309** | -.243* | .192* | .247** | .047 |
| A          | 2.98 (0.54) | .093 | .149 | .165 | .124 |
| C          | 3.59 (0.48) | .087 | .101 | .135 |
| O          | 3.35 (0.62) | .020 | -.045 |
| Age        | 58.28 (14.61) | .075 |

*p < .05, two tailed.  
**p < .01, two tailed.

Table 2. Correlations between HEXACO conscientiousness facets and CPAP adherence.

| Variable   | Mean (SD) | α  | Diligence | Perfectionism | Prudence | CPAPAD |
|------------|-----------|----|-----------|---------------|----------|--------|
| Organisation | 3.46 (0.76) | .64 | -.308** | -.267** | .377** | -.016 |
| Diligence   | 3.90 (0.65) | .71 | -.358** | -.280** | -.228* |
| Perfectionism | 3.57 (0.68) | .67 | .332** |
| Prudence    | 3.43 (0.63) | .62 | -.039 |

*p < .05, two tailed.  
**p < .01, two tailed.

Table 3. Correlations between HEXACO emotionality facets and CPAP adherence.

| Variable   | Mean (SD) | α  | Anxiety | Dependence | Sentimentality | CPAPAD |
|------------|-----------|----|---------|------------|----------------|--------|
| Fearfulness | 2.76 (0.75) | .66 | -.375** | -.266** | -.276** | .035 |
| Anxiety     | 3.49 (0.65) | .54 | .198* | .225* |
| Dependence  | 2.97 (0.74) | .63 | -.271** |
| Sentimentality | 3.40 (0.69) | .60 | -.085 |

*p < .05, two tailed.  
**p < .01, two tailed.

Table 4. Correlations between HEXACO agreeableness facets and CPAP adherence.

| Variable   | Mean (SD) | α  | Gentleness | Flexibility | Patience | CPAPAD |
|------------|-----------|----|------------|-------------|----------|--------|
| Forgiveness | 2.68 (0.64) | .64 | .419** | .405** | .430** | -.016 |
| Gentleness  | 3.20 (0.71) | .69 | -.506** | -.481** | -.327** |
| Flexibility | 2.96 (0.66) | .59 | .521** |
| Patience    | 3.08 (0.76) | .74 | -.218* |

*p < .05, two tailed.  
**p < .01, two tailed.
multiple regression ($r = -0.208, p = .029$). Additional post hoc analyses at the facet level revealed that CPAP adherence was inversely related to the agreeableness facets of gentleness ($r = -0.307, p < .001$) and patience ($r = -0.203, p < .05$) after controlling for age and gender in multiple regression. The finding that better adherence is associated with individuals who are more unforgiving, inflexible, irritable, quick-tempered and judging of others, seems counter-intuitive. One possible explanation for this unanticipated finding is that coping styles may have mediated the relationship between agreeableness and CPAP adherence. According to Carver (e.g., Carver and Connor-Smith, 2010), anger is associated with approach motivation, assertiveness and confrontive coping. A confrontive coping style might be particularly adaptive in the context of adherence to CPAP treatment. Wiebe and Christensen (1996) note that active coping is likely to be a better response style when adapting to chronic illness if there is greater patient, rather than medical, control of the treatment regimen, as is the case with CPAP adherence. In support of this general argument Stepnowsky et al. (2002) found confrontive coping (and planful problem-solving coping) to be associated with better adherence in 23 OSA patients after one month’s CPAP use. However this finding was not replicated in a later study by Moran et al. (2011). While acknowledging the speculative nature of the argument, it may be that being less agreeable leads to a more confrontive coping style which in turn leads to higher CPAP adherence.

4.1. Limitations and future research

In terms of study limitations, a number of potentially relevant factors were not controlled for in the present research. These include biomedical factors such as disease severity, nasal obstruction, improvement in day-time symptoms, and sleepiness, all of which may have some impact on CPAP adherence (Crawford et al., 2014). In order to minimise intrusion into the personal lives of patients, a number of other factors that have been linked to CPAP adherence were not controlled for, including socioeconomic status, education level and level of spousal support. There may also have been a potential problem with selection bias. Patients who participated in the study may have differed in terms of personality and/or adherence from non-participating patients.

The failure to find an association between CPAP adherence and emotionality may have something to do with the way in which emotionality is operationalised by the HEXACO-PI-R. Some measures of emotionality/neuroticism include an impulsivity facet (e.g., Costa and McCrae, 1995). However, this impulsivity facet is missing from the HEXACO-PI-R emotionality dimension. Studies that use measures of neuroticism/emotionality that include an impulsivity facet may be more likely to find a significant (inverse) association with CPAP adherence.

Finally, while reliability of personality scales at the dimensional level was consistently high in the present study, reliability at the facet level was more variable and in some cases substandard. It is worth noting that the three facets that were significantly correlated with CPAP adherence – diligence ($\alpha = .71$), gentleness ($\alpha = .69$) and patience ($\alpha = .74$) – had the highest internal consistency estimates of any of the facets under consideration in this study. It may be that the failure to find significant associations between CPAP adherence and other HEXACO-PI-R facets was due to an attenuation of correlation coefficients caused by measurement error. It is recommended that future research employ the 200 item HEXACO which tends to yield higher internal consistency estimates at the facet level (Lee and Ashton, 2008).

5. Conclusion

OSA is a disease that is increasing in prevalence and one that carries high health, social and economic costs. While CPAP is effective treatment, a significant proportion of people with OSA show poor adherence. It is important then to elucidate the biopsychosocial factors that might inform the development of appropriate interventions to increase adherence. While there is much research linking personality to health and health behaviours including adherence, the research on personality and CPAP adherence is limited. In the present study, the hypothesised relationships between CPAP adherence and the dimensions of conscientiousness and emotionality were not supported. However CPAP adherence was found to be positively correlated with the diligence facet of conscientiousness. Furthermore, in post hoc analyses, CPAP adherence was found to be negatively correlated with agreeableness and two of its facets: patience and gentleness.

Declarations

Author contribution statement

R. Buckingham: Conceived and designed the experiments; Performed the experiments; Contributed reagents, materials, analysis tools or data; Wrote the paper.

J. Corkerson: Conceived and designed the experiments; Analyzed and interpreted the data; Wrote the paper.

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Data availability statement

Data will be made available on request.

Declaration of interests statement

The authors declare no conflict of interest.

Additional information

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References

Axelson, M., Brink, E., Lundgren, J., Lötvall, J., 2011. The influence of personality traits on reported adherence to medication in individuals with chronic disease: an epidemiological study in West Sweden. PloS One 6 (3), e18241.

Berry, R.B., Bodhiraju, R., Gottlieb, D.J., Gonzalez, D., Iber, C., Kasper, V.K., Quan, S.F., 2012. Rules for scoring respiratory events in sleep: update of the 2007 AASM manual for the scoring of sleep and associated events. Journal of Clinical Sleep Medicine 8 (5), 597–619.

Bogg, T., Roberts, B.W., 2004. Conscientiousness and health-related behaviors: a meta-analysis of the leading behavioral contributors to mortality. Psychol. Bull. 130 (6), 887–919.

Bogg, T., Roberts, B.W., 2013. The case for conscientiousness: evidence and implications for a personality trait marker of health and longevity. Ann. Behav. Med. 45 (3), 278–288.

Carver, C.S., Connor-Smith, J., 2010. Personality and coping. Annu. Rev. Psychol. 61, 679–704.

Cohen, J., Cohen, P., West, S.G., Aiken, L.S., 2003. Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences, third ed. Lawrence Erlbaum Associates Publishers, Mahwah, NJ.

Costa, P.T., McCrae, R.R., 1995. Domains and facets: hierarchical personality assessment using the revised NEO personality inventory. J. Pers. Assess. 64 (1), 21–50.

Costa, P.T., McCrae, R.R., Losada, D.A., 1991. Facet scales for agreeableness and conscientiousness: a revision of the NEO personality inventory. Pers. Individ. Differ. 12 (9), 887–898.

Costa, P.T., Weiss, A., Dubenstein, P.R., Friedman, B., Siegler, L.J., 2014. Personality facets and all-cause mortality among medicare patients aged 66 to 102: a follow-on study of Weiss and Costa (2005). Psychosom. Med. 76 (5), 370–378.

Courneya, K.S., Hellsten, L.A.M., 1998. Personality correlates of exercise behavior, motives, barriers and preferences: an application of the five-factor model. Pers. Individ. Differ. 24 (5), 625–633.

Crawford, M.R., Espie, C.A., Bartlett, D.J., Grunstein, R.R., 2014. Integrating psychology and medicine in CPAP adherence—New concepts? Sleep Med. Rev. 18 (2), 123–139.

De Vries, R.E., de Vries, A., de Hoogh, A., Peij, J., 2009. More than the Big Five: egoism and the HEXACO model of personality. Eur. J. Pers. 23 (8), 635–654.

Donnellan, M.B., Oswald, F.L., Baird, B.M., Lucas, R.E., 2006. The mini-IPIP scales: tiny-yet-effective measures of the Big Five factors of personality. Psychol. Assess. 18 (2), 192.
