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 ScienceDirect

Personality and Individual Differences 44 (2008) 1193–1202

PERSONALITY AND
INDIVIDUAL DIFFERENCES

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Mindfulness as a moderator of the relationship between dehydroepiandrosterone and reported physical symptoms

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Received 23 August 2007; received in revised form 15 November 2007; accepted 22 November 2007

Available online 31 December 2007

Abstract

The present study tested the hypothesis that mindfulness leads to greater concordance between physiological functioning (dehydroepiandrosterone; DHEA) and the psychological experience of that functioning (physical symptoms). Participants completed the mindful Attention Awareness Scale (Brown & Ryan, 2003) and a questionnaire assessing the severity of recent physical symptoms. In addition, each participant provided a saliva sample that allowed for the measurement of DHEA. It was found that those higher in mindfulness had a stronger negative relationship between DHEA and symptoms than those lower in mindfulness. Healthcare providers can use mindfulness to predict which patients are likely to have greater insight into their physiological health. The results also provide further validation of the mindfulness construct as an important predictor of internal concordance.

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Keywords: Dehydroepiandrosterone; DHEA; Mindfulness; Physical symptoms

1. Introduction

A person’s health is a multifaceted experience that includes at least three components: physiological activity, awareness of symptoms, and illness-related behavior (Davison & Pennebaker,

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1996). Measures of these facets are only moderately correlated with each other (c.f., Pennebaker, 1982). The current investigation will attempt to identify those individuals who show a stronger correlation or concordance between their physiological activity (their levels of salivary dehydroepiandrosterone) and their symptom awareness. It is expected that those who are high on mindfulness (Brown & Ryan, 2003) will show a greater concordance between these health-related measures.

1.1. Dehydroepiandrosterone

Dehydroepiandrosterone (DHEA) and its sulfate (DHEAS) are two of the most abundant steroids in the human body; only cholesterol is present in greater amounts (Labrie et al., 2005). The majority of DHEA is produced by the adrenal glands; but it is also produced by the gonads, adipose tissue, and brain (Pieper & Lobocki, 2000). DHEA plays an important role in the onset of puberty and the development of secondary sex characteristics (Grumbach, 2002). As such, DHEA levels are generally low in early life, begin to increase rapidly in the years preceding the onset of puberty (between ages 7 and 9), continue to increase until early adulthood, and then begin to decline (Kroboth, Salek, Pittenger, Fabian, & Frye, 1999). It has been found that at ages 70–80, DHEA concentrations are approximately 20% and 30% for men and women, respectively, of the corresponding levels at ages 20–30 (Labrie, Bélanger, Cusan, Gomez, & Caridas, 1997).

In addition to regulating sexual development, DHEA is related to physical health and immune functioning. In animal studies, high levels of DHEA have been linked to protection from a number of viral and bacterial infections in mice (Padgett, Sheridan, & Loria, 1995). In humans, low levels have been linked to a wide variety of physical ailments such as diabetes, obesity, and rheumatoid arthritis (c.f., Celec & Starka, 2003; Ernestam, Hafstrom, Werner, Carlstrom, & Tengstrand, 2007; Labrie et al., 2005). Additionally, DHEA plays a role in the course of HIV. People with lower levels of DHEA are likely to have lower CD4 cell counts and more likely to have progressed from HIV infection to AIDS (Christeff et al., 1996). In a recent review of studies investigating the link between DHEA (and DHEAS) and coronary heart disease, the majority of studies found that those with lower levels of either steroid are at an increased risk for heart disease (Alexandersen, Haarbo, & Christiansen, 1997).

As noted above, DHEA levels decrease from early adulthood throughout the rest of life. Accordingly, it has been proposed that decreases in DHEA levels are responsible for the general decrease in health with age (c.f., Celec & Starka, 2003). Seemingly contrary to the age-related decline, one study found that the average DHEA level for the 80+ age group was higher than the corresponding average for the 60–80 age group. The investigators suggested that their unexpected finding simply indicates that people high in DHEA live longer than those who are low (Sulcová, Hill, Hampl, & Stárka, 1997).

Clearly, there is substantial evidence linking people's health to their basal DHEA level. Indeed, this link has led some to recommend that DHEA be given as a supplement to help battle the effects of aging (Kroboth, Salek, Pittenger, Fabian, & Frye, 1999; Labrie et al., 2005), as well as to increase adrenal functioning in patients who have received tumor necrosis factor treatment for rheumatoid arthritis (Ernestam et al., 2007).

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