

# Mindfulness and integrative self-knowledge: Relationships with health-related variables

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This study examined how mindfulness and integrative self-knowledge were related to health-related issues. Men in general population ( $n = 103$ ) and coronary heart disease samples ( $n = 101$ ) completed the Mindful Attention Awareness Scale, the Integrative Self-knowledge Scale, the Type 2 subscale of the Interpersonal Reactions Inventory, the Perceived Stress Scale, and the Anxiety and Depression Scales. In both samples, there was a moderate positive correlation between mindfulness and integrative self-knowledge and they were negatively correlated with all health-related variables. However, only integrative self-knowledge explained independent variance in health-related variables. Specifically, in both samples, the relationship between mindfulness and health-related variables was mediated by integrative self-knowledge. Mindfulness and integrative self-knowledge are related domains of self-awareness that are associated with a range of health-related variables. These relationships are robust across samples drawn from general population and patients with coronary heart disease. The finding that integrative self-knowledge explained additional variance in the health-related variables after the contribution of mindfulness had been accounted for suggests that reflective self-awareness in integrative self-knowledge may make a unique contribution to the explanation of individual differences in health variables.

**Keywords:** Mindfulness; Integrative self-knowledge; Coronary heart disease; Health-related variables.

Cette étude examine comment la plénitude de la conscience et la connaissance intégrative de soi sont reliées à des épisodes de santé. Des hommes issus de la population en général ( $N = 103$ ) et un échantillon de sujets présentant des problèmes cardiaques coronariens ( $N = 101$ ) ont complété l'échelle de plénitude de la conscience (Mindful Attention Awareness Scale), l'échelle de connaissance intégrative de soi (Integrative Self-Knowledge Scale) et la sous-échelle de type 2 de l'inventaire des réactions interpersonnelles (Interpersonal Reactions Inventory), l'échelle de perception du Stress (Perceived Stress Scale) et les échelles d'anxiété et de dépression (Anxiety and Depression Scales). Dans les deux échantillons, il y a eu une corrélation modérée positive entre la plénitude la conscience et la connaissance intégrative de soi et celles-ci furent négativement corrélées avec toutes les variables reliées à la santé. Cependant, seule la connaissance intégrative de soi explique la variance des variables indépendantes reliées à la santé. Précisément, dans les deux échantillons, la relation entre la plénitude de la conscience et les variable de la santé est modérée par la conscience intégrative de soi. La plénitude la conscience et la connaissance intégrative de soi sont des domaines de la conscience de soi qui sont associés avec un ensemble de variables reliées à la santé. Ces relations sont solides chez un échantillon tiré de la population en général ainsi que chez des patients qui présentent de troubles cardiaques coronariens. Le fait de montrer que la connaissance intégrative de soi explique une variance additionnelle dans les variable de la santé une fois qu'on a pris en compte la contribution de la plénitude de la conscience, suggère que la conscience réflexive de soi à l'intérieur de la connaissance intégrative de soi puisse apporter une contribution significative à l'explication des différences individuelles dans les variables de la santé.

Este estudio examinó cómo la conciencia plena y el autoconocimiento integrador se relacionaron con los problemas de salud. Muestras de hombres de población general ( $n = 103$ ) y con enfermedad cardíaca coronaria ( $n = 101$ ) contestaron la Escala de conciencia atencional plena, la Escala de autoconocimiento integrador, la subescala Tipo 2 del

Inventario de reacciones interpersonales, la Escala de estrés percibido y las Escalas de ansiedad y depresión. En ambas muestras hubo una correlación positiva moderada entre la conciencia plena y el autoconocimiento integrador, y correlacionaron negativamente con todas las variables de salud. Sin embargo, sólo el autoconocimiento integrador explicó la varianza independiente en las variables de salud. Específicamente, en ambas muestras el autoconocimiento integrador medió la relación entre la conciencia plena y las variables de salud. La conciencia plena y el autoconocimiento integrador son dominios de la autoconciencia relacionados entre ellos, que se asocian con un conjunto de variables de salud. Estas relaciones son robustas entre muestras extraídas de población general y pacientes con enfermedad cardíaca coronaria. El hallazgo de que el autoconocimiento integrador explicó una varianza adicional en las variables de salud tras considerar la contribución de la conciencia plena sugiere que la autoconciencia reflexiva del autoconocimiento integrador hace una contribución única a la explicación de las diferencias individuales en las variables de salud.

A distinctive human characteristic is the ability to think about oneself in complex, conscious, and abstract ways (Leary & Buttermore, 2003). The application of this ability results in self-awareness. Although it is a species-typical attribute, self-awareness differs across individuals and may change across contexts and time. Individual differences in self-awareness are associated with mental and physical health (Brown & Ryan, 2003; Ghorbani, Watson, & Weathington, 2009; Ledesma & Kumano, 2009; McCracken & Velleman, 2010). This study extends previous research by exploring the associations between two domains of self-awareness and several health-related variables.

Self-awareness is focused attention on the self or the self's experience of the environment (Wicklund & Duval, 1971). It has two main dimensions. Experiential self-awareness is focused attention on moment-to-moment changes in what happens to us, and in us, at successive moments of perception (Thera, 1972). Reflective self-awareness is the "analysis of self-experience through more complex, higher-order cognitive functions" (Ghorbani, Watson, Bing, Davison, & LeBreton, 2003, p. 241). Both dimensions can be temporary states (Wicklund & Duval, 1971) or dispositional traits (Fenigstein, Scheier, & Buss, 1975).

Trait and state self-awareness have a number of different domains, including mindfulness, private self-consciousness, and integrative self-knowledge (ISK) (Brown & Ryan, 2003; Ghorbani, Cunningham, & Watson, 2010). These domains are conceptually distinct and are believed to promote physical and mental health through different processes. Mindfulness is an aspect of experiential self-awareness. It involves a pre-reflective mode of processing: an "enhanced attention to, and awareness of, current experience or present reality" (Brown & Ryan, 2003, p. 822). By focusing on living in the present, mindfulness supports physical and mental health by "disengaging individuals from automatic thoughts, habits and unhealthy behavior patterns" (Brown &

Ryan, 2003, p. 823) and strengthening healthy regulatory processes by directing attention to psychological, somatic, and environmental cues (Brown & Ryan, 2003). In contrast, private self-consciousness is an aspect of reflective self-awareness. Private self-consciousness is similar to "objective self-awareness" (Wicklund & Duval, 1971). It involves introspective and self-reflective awareness of one's current or past perceptions, beliefs, moods, and feelings (Fenigstein et al., 1975). Thus, the central distinction between mindfulness and private self-consciousness lies not in the content of awareness but in the mode of processing. ISK encompasses aspects of both experiential and reflective self-knowledge. It combines "living in the present" and introspection that reflects "an adaptive and empowering attempt of the self to understand its experience across time to achieve desired outcomes" (Ghorbani, Watson, & Hargis, 2008, p. 397). The latter, reflective aspect of ISK differs from private self-consciousness in its focus on comparing the present with internal standards of functioning based on past self-experience, and with desired future self-experience. ISK supports physical and mental health by identifying needs, conflicts, and existential concerns, and providing information necessary for making health-enhancing behavior changes (e.g., Ghorbani et al., 2010). Most previous studies have focused on only one domain of self-awareness. The present study focuses on two: mindfulness and ISK.

Recently, the relationship between mindfulness and health has been a focus of research. Both experimental and observational studies consistently find positive associations between mindfulness and many aspects of physical (e.g., Ledesma & Kumano, 2009) and mental health (e.g., Bohlmeijer, Prenger, Taal, & Cuijpers, 2010). Mental health domains associated with mindfulness include depression (e.g., Carmody, Reed, Kristeller, & Merriam, 2008), anxiety (e.g., Bohlmeijer et al., 2010), quality of life (e.g., Surawy, Roberts, & Silver, 2005), subjective vitality (Ghorbani et al., 2009), and acceptance of chronic pain

(McCracken & Velleman, 2010). Physical health domains associated with mindfulness include medical visit frequency (Brown & Ryan, 2003), pain (e.g., McCracken & Velleman, 2010), blood pressure, fasting lipid profile (Edelman et al., 2006), body mass, cortisol, lymphocytes, and antibody response to viruses (Ledesma & Kumano, 2009).

Only two observational studies have examined the relationship between ISK and health. These found associations between ISK and perceived stress, subjective vitality, symptoms of anxiety and depression, and physical symptoms of strain (Ghorbani et al., 2009, 2010).

In order to further the development of theory on the role of self-awareness in health, it is important to understand the relationship between different domains of self-awareness, and any differences between domains in their relationships with mental and physical health. However, only one published study has examined the relationship between mindfulness and ISK (Ghorbani et al., 2010). Its findings suggest that these two domains are positively associated, but distinct. It is also important to understand similarities and differences in the associations between these domains of self-awareness and physical and mental health. The single relevant study found that subjective stress was more strongly related to ISK than to mindfulness (Ghorbani et al., 2010). No study has examined whether these two domains make independent contributions to mental and physical health.

Self-awareness interventions for disease prevention target populations without significant health impairments (e.g., Barnes, Davis, Murzynowski, & Treiber, 2004), while those for psychological rehabilitation (e.g., Reibel, Greenson, Brainard, & Rosenzweig, 2001) target populations with health impairments. The relationship between mindfulness and physical and mental health has been demonstrated in samples relevant to disease prevention (e.g., Brown & Ryan, 2003; Carmody et al., 2008) and rehabilitation (e.g., Grossman, Niemann, Schmidt, & Walach, 2004; Witkiewitz & Bowen, 2010). In contrast, the parallel relationships for ISK have been examined only in samples relevant to disease prevention. The present study examined the relationship between mindfulness and ISK, and their associations with health variables in samples relevant to disease prevention (general population) and psychological rehabilitation (health-impaired population).

The ideal context for such comparisons would be one in which self-awareness was valued and in which measures of mindfulness and ISK have been validated. The Islamic Republic of Iran meets these conditions. The high cultural value of self-awareness in Iran reflects its high value in Islam (Ghorbani et al., 2003). Mindfulness has its roots in Buddhist and

Hindu meditation and in Christian contemplative traditions. However, its clinical use has been largely achieved through its secularization (Dimidjian & Linehan, 2003). The introduction of mindfulness to Iran about 10 years ago coincided with the development of the modern psychological concept of ISK in Iran and the USA (Ghorbani et al., 2003).

Patients with coronary heart disease (CHD) were selected as the health-impaired population. Heart disease is either the first or second leading cause of death in low-, middle-, and high-income countries (World Health Organization, 2008) and is the leading cause of death in Iran (Taghavi, 2002). Because men have a higher risk of CHD than women (Andreoli, 2004), the study focuses on men. Psychological processes have been implicated in CHD. In particular, the core components of Type 2 interpersonal reaction style (Grossart-Maticek & Eysenck, 1990), anger and hostility, are associated with increased heart disease in populations that were initially healthy, and with poor prognosis in patients diagnosed with CHD (Chida & Steptoe, 2009). In contrast, mindfulness is positively associated with the physical and mental health of patients with CHD (Edelman et al., 2006; Grossman et al., 2004; Reibel et al., 2001). Because ISK and mindfulness are both adaptive self-awareness processes it is predicted that they will be negatively related to Type 2 interpersonal reaction style in both samples. It is also predicted that levels of Type 2 interpersonal reaction style will be higher and self-awareness will be lower in the CHD sample than in the general population sample.

This study addressed three aims. First, it examined the relationship between two domains of trait self-awareness: mindfulness (experiential self-awareness) and ISK (aspects of both experiential and reflective self-awareness). Second, it directly compared the associations between these two domains and health-related variables. The third aim was to determine whether relationships between self-awareness and health-related variables differed between general population and CHD samples. An exploratory analysis examined between-sample differences in self-awareness and health-related variables.

## METHOD

### Participants

The general population sample ( $n = 103$ ) was recruited from workers in a large cement factory in Tehran who reported no diagnosis of any acute or chronic medical condition. Recruitment had a very high success rate (approximately 90%). Most men were young adults ( $M = 33.6$  years,  $SD = 7.9$ ) who

were married (89.8%), and one half had a university education (50.5%).

The health-impaired sample ( $n = 101$ ) was recruited from patients with a diagnosis of CHD who had been admitted to Imam Khomeini Hospital, Tehran, for angioplasty or a coronary artery bypass graft. Recruitment had a high success rate (approximately 80%). Most men were middle-aged ( $M = 47.5$  years,  $SD = 13.1$ ), married (85.7%), and did not have a university education (70.8%).

### Procedure and materials

The study was approved by institutional review boards at both Tehran University and the hospital. The research was explained to each potential participant and questionnaires were hand-delivered to those who gave consent. The study used Persian language (Farsi) measures that had been used successfully in previous research (Ghorbani et al., 2009, 2010).

Trait mindfulness, the general tendency to be attentive to and aware of present-moment experience in daily life, was assessed using the Mindful Attention Awareness Scale (MAAS) (Brown & Ryan, 2003). This self-report measure consists of 15 items that are rated on a six-point scale (*almost always* to *almost never*). An example item is: "I rush through activities without being really attentive to them" (negatively scored). The scale yields a single score, with higher values reflecting greater mindfulness. Trait ISK, which encompasses aspects of reflective and experiential self-awareness, was assessed using the Integrative Self-knowledge Scale (Ghorbani et al., 2008, p. 395). This self-report measure consists of 12 items that are rated on a five-point Likert-type scale (*largely untrue* to *largely true*). Examples of experiential self-awareness and reflective self-awareness are: "Often, I am unaware of my thoughts and feelings as they are happening, and only later get some idea about what I may really have been experiencing" (negatively scored) and "If I need to, I can reflect about myself

and clearly understand the feelings and attitudes behind my past behaviors" (positively scored), respectively. The scale yields a single score, with higher values reflecting greater ISK.

Type 2 interpersonal reaction style was assessed using the relevant subscale from the Interpersonal Reactions Inventory (Grossart-Maticcek & Eysenck, 1990). This self-report measure consists of 10 items with yes/no answers. Items reflect anger, hostility and frustration. An example item is: "Certain people keep interfering with my personal development" (positively scored). The scale yields a single score, with higher values reflecting a more extreme interpersonal reaction style.

Three aspects of mental health were assessed. Subjective stress, "the degree to which situations in one's life are appraised as stressful," was measured using the Perceived Stress Scale (PSS) (Cohen, Kamarck, & Mermelstein, 1983, p. 385). This self-report measure consists of 14 questions that are rated on a five-point scale (*never* to *very often*). An example question is: "In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?" (positively scored). The scale yields a single score, with higher values reflecting higher levels of subjective stress. Non-somatic symptoms of anxiety and depression were assessed using the Anxiety and Depression Scales (Costello & Comrey 1967). This self-report measure consists of 23 items: 14 for depression and nine for anxiety. Following previous research (Ghorbani et al., 2008), the original nine-point rating scale was simplified to five points (*strongly disagree* to *strongly agree*). Examples of positively scored items for anxiety and depression are: "I get rattled easily" and "I feel blue and depressed," respectively. The scales yield separate scores for anxiety and depression, with higher values reflecting greater symptom burden.

The internal consistency of all measures was satisfactory to high (Table 1).

**TABLE 1**  
Means, standard deviations, and Cronbach alpha values for measures of self-awareness and health-related variables in two samples

	Possible range of scores	General population ( $n = 103$ )			CHD sample ( $n = 101$ )		
		<i>M</i>	<i>(SD)</i>	<i>Cronbach alpha</i>	<i>M</i>	<i>(SD)</i>	<i>Cronbach alpha</i>
Mindfulness	1–6	4.4	(0.7)	0.78	3.9	(0.9)	0.73
Integrative self-knowledge	1–5	3.4	(0.6)	0.76	3.1	(0.7)	0.77
Type 2 interpersonal reaction style	1–2	0.4	(0.3)	0.79	0.6	(0.2)	0.70
Subjective stress	1–5	2.5	(0.6)	0.77	3.0	(0.6)	0.81
Anxiety	1–5	2.7	(0.8)	0.79	3.2	(0.8)	0.77
Depression	1–5	2.2	(0.7)	0.88	2.7	(0.8)	0.83

**TABLE 2**  
Correlations between self-awareness and health-related variables in two samples

	<i>General population (n = 103)</i>		<i>CHD sample (n = 101)</i>	
	<i>Mindfulness</i>	<i>ISK</i>	<i>Mindfulness</i>	<i>ISK</i>
Integrative self-knowledge (ISK)	0.56**		0.44**	
Type 2 interpersonal reaction style	-0.31**	-0.43**	-0.23*	-0.22*
Subjective stress	-0.37**	-0.58**	-0.22*	-0.44**
Anxiety	-0.36**	-0.60**	-0.25*	-0.34**
Depression	-0.38**	-0.53**	-0.22*	-0.28**

\* $p < 0.05$ ; \*\* $p < 0.01$ .

### Statistical analysis

Data were analyzed using IBM SPSS Statistics (version 19). The relationship between mindfulness and ISK was examined using Pearson correlations. The associations between the two self-awareness variables and the four criterion variables (Type 2 interpersonal reaction style, subjective stress, anxiety, and depression) were examined using multiple linear regressions. Between-sample differences in relationships between variables were examined by comparing independent correlations (Cohen & Cohen, 1983). In the exploratory analysis, between-sample differences in self-awareness and criterion variables were examined by multivariate analysis of covariance (MANCOVA), with participant age as the covariate. Education was not included as a covariate because it did not influence any self-awareness or criterion variable after age differences had been accounted for. A significance level of  $p < 0.05$  was adopted for all analyses.

## RESULTS

In the absence of normative data, descriptive statistics for all variables (Table 1) were interpreted with reference to

previous research. In the general population sample, levels of mindfulness, perceived stress, anxiety, and depression were similar to general population and university samples in Iran and the USA (Brown & Ryan, 2003; Carmody et al., 2008; Cohen et al., 1983; Ghorbani et al., 2010). Levels of mindfulness in the CHD sample were similar to those previously reported for health-impaired samples in the UK (McCracken & Velleman, 2010). Levels of ISK in the general population and CHD samples were approximately one standard deviation above those previously reported for university students in Iran and the USA (Ghorbani et al., 2003, 2008, 2010).

There was a moderate positive correlation (accounting for less than one-third of the variance) between mindfulness and ISK in both samples (Table 2). As expected, mindfulness and ISK showed negative relationships with all criterion variables in both samples (Table 2).

The possibility that ISK mediated the relationship between mindfulness and health-related variables was explored in a series of regression analyses (Table 3). Mindfulness predicted ISK (beta = .52,  $p < .001$ ). When it was entered in Step 1, mindfulness also predicted all of the health-related variables in both samples. Adding ISK to the prediction equation

**TABLE 3**  
Independent variance in health-related variables explained by integrative self-knowledge (ISK) in the general population and CHD samples

<i>Sample</i>	<i>Mindfulness entered in Step 1</i>		<i>ISK added in Step 2—<math>\beta</math> for:</i>			<i>Sobel statistic</i>
	<i>R<sup>2</sup> change</i>	<i><math>\beta</math></i>	<i>R<sup>2</sup> change</i>	<i><math>\beta</math> for Mindfulness</i>	<i><math>\beta</math> for ISK</i>	
<i>General population (n = 103)</i>						
Type 2 interpersonal reaction style	.097**	-.31**	.099**	-.10	-.38**	-3.89**
Subjective stress	.135**	-.37**	.209**	-.06	-.55**	-4.85**
Anxiety	.133**	-.36**	.230**	-.04	-.58**	-4.94**
Depression	.141**	-.38**	.153**	-.11	-.47**	-4.54**
<i>CHD sample (n = 101)</i>						
Type 2 interpersonal reaction style	.051*	-.23*	.017	-.16	-.15	-1.98*
Subjective stress	.047*	-.22*	.143**	-.03	-.42**	-3.43**
Anxiety	.062*	-.25*	.065**	-.12	-.29**	-2.88**
Depression	.046*	-.22*	.044*	-.11	-.23*	-2.50*

\* $p < 0.05$ ; \*\* $p < 0.01$ .



increased the variance explained for all health-related variables in the general population sample, and for all health-related variables except Type 2 interpersonal reaction style in the CHD sample. In all cases, the beta for mindfulness was no longer significant after ISK had been added to the prediction equation. In all cases except Type 2 interpersonal reaction style in the CHD sample, the beta for ISK in Step 2 was significant. Sobel statistics indicated that after ISK had been added in Step 2, there was a significant reduction in the variance that mindfulness accounted for in these health-related variables in both samples. This pattern of results fulfilled all the criteria for full mediation of the relationship between mindfulness and most health-related variables by ISK (Baron & Kenny, 1986). The single exception was Type 2 interpersonal reaction style in the CHD sample. In contrast, when ISK was entered in Step 1 of the regression, it was negatively correlated with all health-related variables in both samples, but adding mindfulness in Step 2 failed to increase the variance explained in any health-related variable in either sample (all  $R^2 < .015$ , all  $p > .21$ ). Thus, after ISK had been accounted for, mindfulness was redundant in predicting all health-relevant variables in the general population sample, and in predicting all health-relevant variables except Type 2 interpersonal reaction style in the CHD sample.

The exploratory analysis showed that the general population sample had higher levels of mindfulness and ISK, and lower levels of Type 2 interpersonal reaction style, subjective stress, and nonsomatic symptoms of anxiety and depression than the CHD sample (Wilks' lambda = .850;  $F(6, 158) = 4.66$ ,  $p < 0.001$ ;  $F = 11.04$ ,  $p < .001$ ;  $F = 5.87$ ,  $p < .05$ ;  $F = 17.68$ ,  $p < .001$ ;  $F = 14.63$ ,  $p < .001$ ;  $F = 13.55$ ,  $p < .001$ ;  $F = 15.59$ ,  $p < .001$ ; respectively) (see also Table 1).

Despite these differences in the mean scores for all variables, the two samples did not differ in the valence or strength of the relationships between the criterion variables and mindfulness ( $|z| < 1.3$  in all cases) or ISK ( $|z| < 1.9$  in all cases) (see also Table 3).

## DISCUSSION

The relationship between self-awareness and health has recently been an area of interest for researchers and clinicians. However, the relationships between different domains of self-awareness remain poorly understood and there have been few attempts to identify the domain that is most strongly related to health. This study addressed this gap in knowledge for two domains of self-awareness: mindfulness and ISK.

There was only a moderate association between mindfulness and ISK in both samples. This confirms

the single previous relevant finding (Ghorbani et al., 2010) and is consistent with the conclusion that mindfulness and ISK are empirically as well as theoretically related but distinct domains of self-awareness.

Mindfulness and ISK are believed to promote physical and mental health through different mechanisms. Therefore, the study also compared the associations between these two domains of self-awareness, three aspects of mental health (subjective stress, anxiety, and depression) and Type 2 interpersonal reaction style. Both domains of self-awareness showed negative associations with all criterion measures in both samples. This finding is consistent with previous research concerning the association between mental health and mindfulness (e.g., Brown & Ryan, 2003) and ISK (e.g., Ghorbani et al., 2010). (No previous published research has examined the relationship between self-awareness and Type 2 interpersonal reaction style.) However, only one of the self-awareness variables explained independent variance in the criterion variables. Mindfulness was largely redundant after the association between ISK and criterion variables had been accounted for. In contrast, ISK continued to account for independent variance in criterion variables after variance attributable to mindfulness had been accounted for. While this suggests that reflective self-awareness contributes to health, it will be important to determine whether the present finding, based on a unidimensional measure of mindfulness, can be replicated using multidimensional measures of mindfulness (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006).

The study also examined whether the relationships between variables differed between the general population and a health-impaired population. There were no between-sample differences in either the relationship between mindfulness and ISK or the relationships between self-awareness variables and criterion variables, despite between-sample differences in the mean scores for all variables.

Consistent with previous research (Grossman et al., 2004), men with CHD had poorer self-awareness and greater mental health problems and Type 2 interpersonal reaction style than men who had no diagnosis of a chronic health condition. However, any attempt to draw clinical implications from this finding is limited by the cross-sectional design of the research, and the subsequent lack of information about direction of effect. It is possible that low levels of self-awareness contribute to poorer mental health and to a Type 2 interpersonal reaction style. Such a direction of effect is consistent with previous experimental research on the effects of self-awareness on health-related variables (e.g., Carmody et al., 2008; Reibel et al., 2001; Witkiewitz & Bowen, 2010) and with

theoretical arguments about the mechanisms underlying the association between self-awareness and health (e.g., Brown & Ryan, 2003). However, it is also plausible that mental health problems and particular interpersonal reaction styles limit self-awareness, or that a third variable accounts for relationships between self-awareness and the criterion variables.

Despite these shortcomings, this study added to existing knowledge in several ways. First, it confirmed that mindfulness and integrative self-knowledge are empirically as well as theoretically related, but that they show only partial overlap. Second, it confirmed the relevance of self-awareness to health by showing that both mindfulness and integrative self-knowledge are associated with a variety of health-related variables. It extended previous research by directly comparing the relationships between two domains of self-awareness and these health variables. The findings suggest that reflective self-awareness may make a unique contribution to individual differences in these variables. This may have important implications for the direction of research, which has thus far focused on experiential self-awareness, and for the design of interventions. Third, the study showed that relationships between the variables were robust across samples drawn from populations likely to be targeted for disease prevention (general population) and rehabilitation (CHD) and which have different mean distributions of scores. Finally, the findings confirmed previous studies showing that self-awareness is lower in health-impaired samples than in the general population.

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