

ORIGINAL ARTICLE

# Tracing the relationship between wisdom and health

Veronika ROHÁRIKOVÁ<sup>1</sup>, Marián ŠPAJDEL<sup>1,2</sup>, Viera CVIKOVÁ<sup>3</sup>, Fedor JAGLA<sup>1</sup>

<sup>1</sup> Laboratory of Cognitive Neuroscience, Institute of Normal and Pathological Physiology, Slovak Academy of Sciences, Bratislava, Slovakia; <sup>2</sup> Department of Psychology, Faculty of Philosophy and Arts, University of Trnava, Slovakia; <sup>3</sup> Department of Psychology, Faculty of Philosophy, Comenius University, Bratislava, Slovakia.

*Correspondence to:* Veronika Roháriková, Mgr., Institute of Normal and Pathological Physiology, Slovak Academy of Sciences, Sienkiewiczova 1, 813 71 Bratislava, Slovak Republic. TEL.:+421-2-32296022, FAX: +421-2-52968516, E-MAIL: veronika.roharikova@savba.sk

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## Abstract

**BACKGROUND:** Wisdom is a highly appreciated positive personality trait. Therefore, psychology and psychiatry begin to acknowledge favorable influence of wisdom on mental health. As wisdom constitutes a high-level complex phenomenon, several multidimensional models have been suggested to explain its structure.

**OBJECTIVES:** The relation of wisdom – and especially its dimensions (according to the concepts of: Ardel, Webster and Levenson) – to psychological resilience (according to the concept hardiness of Kobasa) and psychopathological symptoms was studied.

**METHODS:** 46 adult volunteers: 20 healthy controls and 26 psychiatric patients with psychosomatic symptoms served as subjects. We quantified wisdom using different assessment tools: Three-Dimensional Wisdom Scale (3D-WS), Self-Assessed Wisdom Scale (SAWS) and Adult Self-Transcendence Inventory (ASTI) and compared the scores in these scales between groups of subjects. Furthermore, we investigated the relationship of wisdom scores to scores of psychological resilience (hardiness) using Personal Views Survey (PVS) and to scores of psychopathological symptoms using the Symptom Checklist-90 (SCL-90).

**RESULTS:** We identified five wisdom dimensions in which psychiatric patients with psychosomatic symptoms scored significantly lower compared to healthy subjects. The same wisdom dimensions were significantly negatively associated with severity of psychopathological symptoms and except one dimension they were significantly positively related to psychological resilience. In addition, two of these dimensions have proved their negative predictive value towards psychopathological symptoms and positive predictive value towards psychological resilience.

**CONCLUSION:** Our results suggest that specific wisdom dimensions, which are positively related to psychological resilience and negatively to psychopathological symptoms may have preventive, therapeutic and/or rehabilitative potential.

## INTRODUCTION

Wisdom is a unique psychological feature highly valued not only in antique Greece but some centuries before that also in ancient India and China. It has been

a long-term focus of the humanities, mainly in the areas of philosophy and theology. Nowadays, researchers in the fields of psychology and sociology are trying to operationalize the term wisdom for the purpose of empirical investigation. Since a multidisciplinary

approach is required, there is also a potential for its further research using conventional scientific methods, e.g. in the field of psychiatry (Meeks & Jeste 2009).

A query whether wisdom can positively influence not only one's psychological resilience but also one's health, life expectancy and the quality of life has become topical. This search runs along with the trend of the holistic approach to the human being and with the current trend in psychiatry, positive psychology, and since the 1970s in health psychology, shifting the focus from illness to health, from treatment to prevention and from risk factors to prevention factors (Renneberg & Hamelstein 2006; Meeks & Jeste 2009).

As wisdom is often considered to be a resilience factor (Baumann & Linden 2008) and since over the past forty years it has attracted increased academic interest, we decided to list the known facts concerning the correlation between wisdom and health. In this endeavor we used information about some current multidimensional concepts of wisdom, new trends and application possibilities. The present study includes also results of our research focused on wisdom dimensions mostly involved in the relationship to mental health. We compared the scores in wisdom dimensions between a group of psychiatric patients with psychosomatic symptoms and healthy subjects and correlated these wisdom dimensions to psychological resilience (hardiness), psychopathological symptoms and age.

## WISDOM AS A COMPLEX CONSTRUCT

Despite the fact that psychological research has been exploring the topic of wisdom for several decades, no generally applicable definition of wisdom has so far been provided. There is a general agreement that wisdom represents a complex construct consisting of individual culture or history dependent components. We distinguish the "western" and "eastern" understanding of wisdom. The "western" understanding is based on the classical Greek philosophy emphasizing the role of rationality. In contrast, the "eastern" understanding of wisdom, represented by ancient Indian and Chinese conceptualizations of wisdom, regards emotional stability as the core of wisdom. The model of wisdom based on non-cognitive aspects was introduced by Levenson *et al* (2005). Webster (2003) postulated that a synthesis of at least intellect and pro-social values would be required for wisdom to emerge. On defining wisdom, Ardel (2004) considers both the "western" and "eastern" understanding of wisdom. For our research, we selected these three concepts allowing quantitative evaluation of wisdom and will introduce them in the following section.

Ardelt (2004) is the author of the three-dimensional concept of wisdom. She describes wisdom as a personal feature characterized by *cognitive, affective, and reflective dimensions* in equilibrium. The cognitive component represents deep understanding of life conditions, tolerating ambiguity in making important life decisions.

Ardelt uses the term affective component to describe sympathetic and compassionate love towards others. The reflective component, which is the premise of the cognitive and affective dimensions, is characterized by the ability to see things from different points of view and requires self-examination, self-awareness and self-insight. Ardel (2003) suggests to measure wisdom by a self-administered Three-Dimensional Wisdom Scale (3D-WS) covering the above mentioned dimensions.

Webster (2003) brings forth a multidimensional model of wisdom consisting of the following five mutually interdependent elements: *experience, emotional regulation, reflexiveness, openness and humor*. Each of these dimensions is indispensable but not a sufficient precondition of wisdom in itself. The dimension of experience supposes successful dealing with critical life changes. The result is adaptation to one's conditions and a deeper understanding of these. The dimension of reflexiveness and constructive emotional regulation are the key components of wisdom. Reflexiveness means evaluative reflection on one's past and present life that serves many psychological functions, such as identity formation, maintenance, self-understanding, problem-solving and coping. Emotional regulation involves an exquisite sensitivity to gross distinction, subtle nuances, complex blends of the full range of human affects and employing emotions in a constructive way. Openness to alternative perspectives, information and possible problem-solving strategies are involved in the efforts of a wise person to optimally overcome obstacles. Wise people recognize and actively use humor in different contexts and for many purposes. Webster introduces a new definition of wisdom which he operationalizes thanks to the Self-Assessed Wisdom Scale (SAWS).

The concept of wisdom by Levenson *et al* (2005) and the methodology of its measurement are based on the conceptualization of wisdom as *self-transcendence*. Self-transcendence involves the ability to gain control over one's self-centered cautiousness. This skill also helps to abandon one's habitual ways of thinking, feeling and doing things and to develop an empathic connectedness with the experience of others. At the same time, it decreases dependence on social definition of self and correlates negatively with neuroticism. Levenson *et al* (2005) developed the Adult Self-Transcendence Inventory (ASTI) to assess wisdom as self-transcendence.

## WISDOM AND HEALTH

Considering wisdom in the context of health, inevitably the question concerning the causality of this relationship arises. Is wisdom a factor positively influencing health or is health a prerequisite for developing wisdom? The relationship here is most likely mutual. If we consider the influence of wisdom on health, the results may be reflected on the psychological as well as the physical level. It may be short-term, i.e. increased psychological resilience, e.g. the concept hardiness pro-

posed by Kobasa (1979), or long-term, i.e. elimination of reactive conditioned psychopathological symptoms. Wise people have reflective and perspective-taking abilities, which enable them to conserve feelings of self-efficacy, satisfaction, general well-being, meaning and purpose in life (Webster *et al* 2012) as have been shown using the 3D-WS (Ardelt 2003) and the SAWS (Webster 2011). Levenson *et al* (2005) suggest also protective mental health effects of self-transcendence because of its relation to hope, emotional well-being and a sense of coherence.

Although in our study we focused more on the correlation between wisdom and mental health, we shall also mention the proposed neural background involving corresponding brain structures and neurotransmitter systems. Key components of wisdom should according to Meeks & Jeste (2009) involve several common regions such as the prefrontal cortex (emotional regulation, decision-making and value relativism), above all the dorsolateral (calculated, ration-based decision-making and competitiveness), and the ventromedial prefrontal cortex (prosocial attitudes and behavior), the orbito-frontal cortex, as well as some subcortical structures, in particular the amygdala and striatum. The proposed model of wisdom should include monoamine systems (dopamine and especially serotonin components).

An example of applied theoretical research of wisdom in the domain of mental health is a psychotherapeutic approach called "Wisdom Therapy" (Schippan *et al* 2004), based on the principles of cognitive therapy. This approach is intended for therapy of a newly described clinically relevant concept of an adjustment disorder called Posttraumatic Embitterment Disorder (PTED) (Linden *et al* 2007). The wisdom therapy originates in a 12-component model of wisdom and primarily encompasses working with special strategies of problem solving which activate wisdom by developing its twelve competencies (Baumann & Linden 2008). Wisdom therapy has proven to be far more effective when treating PTED than standard procedures (Linden *et al* 2011), which confirms the positive influence of wisdom on mental health.

## WISDOM AND AGE

Since wisdom, health and their mutual relationship are influenced by age, we shall summarize the available but conflicting findings about the relationship between wisdom and age in the following section. According to Sternberg (2005), there is no direct correlation between wisdom and age. Wisdom may increase, decrease or stagnate with age. According to Scobel (2009) there is often an unjustified expectation that wisdom is a matter of age and it automatically develops with age. Baltes & Staudinger (1996), for example, based on experiments found that between the ages of 15–25 there is a sharp increase in skills relevant to wisdom, performance and the ability to reason and that the development of what

we understand under the term of wisdom is completed by the age of approximately 25. Later on, it is only possible to further maintain, hone and cultivate wisdom skills. Sternberg (2005) also found that wisdom of younger men was more often a subject to intelligence, while that of older men was more or less unrelated. It can thus be deduced that cognitive mechanics as described by Baltes & Staudinger (1996) (analogy to fluid intelligence) play an important role in achieving cognitive pragmatics (comparable to crystallized intelligence), which they identify with wisdom. Hence wisdom represents declarative and procedural knowledge and its values do not change with age as it is in the case of crystallized intelligence. Theoretical knowledge pertaining to wisdom is most likely available before the actual skill to act wisely (Scobel 2009; Baumann & Linden 2008).

The paradox of aging according to Jeste (2011) is the fact that although physical health is on a decline along with certain cognitive skills (reaction time, information processing, etc.), mental health together with psychosocial functioning and social judgment have the tendency to improve. The reason behind this is the fact that one's reasoning consists of multiple perspectives, allows for compromises and acknowledges the limits of one's own knowledge. The decline in wisdom linked to age may be attributed to neurodegenerative diseases, while a possible increase in wisdom can be explained by neuroplasticity of the brain, especially the compensating mechanisms which use the neural network more effectively, a lasting neuro- and synaptogenesis available thanks to a stimulating environment and a decrease in negative emotionality due to lowered reactivity of the amygdala (Jeste 2011). In contrast, the reflective and executive processes necessary for controlling affectivity increase up to midlife, yet later on they tend to decrease due to loss of cognitive resources (Webster *et al* 2012).

Despite the fact that research of wisdom as a protective measure for health and a resilience factor is under way (Baumann & Linden 2008), it requires further examination (Webster *et al* 2012). In this pilot study, we thus decided to investigate how wisdom is related to mental health. To this aim, we quantified wisdom using different assessment tools and compared wisdom dimensions in healthy subjects and psychiatric patients with psychosomatic symptoms. Furthermore, we investigated the relationship of different dimensions of wisdom to psychological resilience (hardiness), psychopathological symptoms and age.

Our first hypothesis was that psychosomatic patients will reach significantly lower scores in all wisdom dimensions in 3D-WS, SAWS and ASTI than healthy subjects. The second hypothesis was that there is a positive relationship between scores in dimensions of wisdom and hardiness (PVS) and that scores in wisdom dimensions will positively predict the total hardiness score. In the third hypothesis, we expected

that there would be a negative relationship between scores in wisdom dimensions and scores in dimensions of psychopathological symptoms (SCL-90), along with the assumption about the negative predictive value of scores in wisdom dimensions concerning scores in dimensions of SCL-90. Furthermore, we wanted to explore the relationship between the different dimensions of wisdom and age.

## METHODS

The study included 46 adult volunteers: 20 healthy controls (ranging in age from 17 to 61 years [ $M_{age}=33.35$ ;  $SD=11.42$ ]) and 26 inpatients from the Psychosomatic Department, Pinel Psychiatric Hospital, Pezinok, Slovakia (ranging in age from 21 to 61 years [ $M_{age}=44.42$ ;  $SD=10.9$ ]). The subjects signed the informed consent to participate in the study. For each individual we collected demographic data and responses in the following questionnaires: 1) Three-Dimensional Wisdom Scale (3D-WS, Ardeli 2003) inclusive the affective, cognitive and reflective dimensions; 2) Self-Assessed Wisdom Scale (SAWS, Webster 2003) consisting of the dimensions of: experience, emotional regulation, reflexiveness, openness, and humor; 3) Adult Self-Transcendence Inventory (ASTI, Levenson *et al* 2005); 4) Hardiness Questionnaire (PVS, Kobasa 1985) containing the dimensions of: control, commitment and challenge; 5) Symptom Checklist-90 (SCL-90, Derogatis *et al* 1973; Boleloucký 1993). The following six of nine SCL-90 dimensions were selected: somatization, hypersensitivity, depression, anxiety, hostility, and paranoia. For evaluation of the results we used the statistical program SPSS 18.0 and the following statistical methods: the differences between groups in the scores in 3D-WS, SAWS and ASTI were compared using the t-test and

in the next step, the associations between these scores and the scores in PVS and SCL-90 were analyzed using the Pearson correlation coefficient  $r$  and multiple linear regression. We considered the  $p$ -value ( $p<0.05$ ) as statistically significant and the presented  $p$ -values were two-sided.

## RESULTS

### *Hypothesis 1*

Scores in Levenson's concept of wisdom, in reflective and cognitive dimensions of Ardeli's concept of wisdom and in dimensions of humor, openness, and emotional regulation of Webster's wisdom concept were significantly lower in the group of psychiatric patients with psychosomatic symptoms compared to healthy subjects. On the other hand, the scores for Webster's dimension of experience were significantly higher in the patients compared to controls (Table 1).

### *Hypothesis 2*

As seen in Table 2, a significant relationship exists between Ardeli's cognitive and reflective dimensions and Webster's dimensions of humor to all subscales of hardiness. Openness is significantly related to challenge. All of these wisdom subscales are also significantly related to the total score of hardiness.

In the next step, we decided therefore to use multiple linear regression (Table 3) with the dependent variable of hardiness and with the independent variables of Ardeli's affective, cognitive and reflective dimensions, as well as with Webster's dimensions of experience, emotional regulation, reflexiveness, humor and openness, and Levenson's concept of wisdom as self-transcendence. On using the stepwise approach, the best predictors of the hardiness score appeared to be

**Tab. 1.** The differences between group of psychiatric patients with psychosomatic symptoms (psychosomatic group) and healthy controls (control group) in the scores of Ardeli's, Webster's and Levenson's wisdom dimensions.

Wisdom dimensions		Mean (SD)		
		Control group (n=19)	Psychosomatic group (n=24)	p-value
ARDELT	affective	45.9 (4.4)	45.1 (4.7)	0.589
	cognitive	49.3 (7.3)	42.958 (8.3)	0.012*
	reflective	44.0 (6.1)	36.8 (5.9)	0.000**
		Control group (n=19)	Psychosomatic group (n=26)	p-value
WEBSTER	experience	35.2 (4.8)	39.2 (4.9)	0.010**
	emot. regul.	35.1 (5.5)	31.4 (5.8)	0.040*
	reflexiveness	32.5 (5.9)	35.5 (4.9)	0.075
	humor	36.4 (4.6)	29.7 (8.1)	0.002**
	openness	34.8 (5.2)	31.0 (6.8)	0.041*
		Control group (n=20)	Psychosomatic group (n=26)	p-value
LEVENSON	self-transcendence	92.2 (8.5)	86.4 (10.5)	0.51

\* Correlation is significant at the 0.05 level; \*\* Correlation is significant at the 0.01 level.

Ardelt's reflective and cognitive dimensions, which can significantly predict the level of the dependent value [ $F(2,12)=28.92$ ;  $p=0<0.001$ ;  $D-W=1,42$ ]. The values of the model's coefficients are in Table 3. The value of the coefficient of determination  $R^2=0.828$ , meaning that 83% of the diffusion in the hardiness score can be explained by this model.

### Hypothesis 3

Ardelt's reflective and cognitive dimensions of wisdom and Webster's dimensions of humor, openness and emotional regulation were significantly negatively associated with severity of psychopathological symptoms assessed by the Symptom Checklist-90 (SCL-90) (Table 4). In general, subjects with high values in wisdom

**Tab. 2.** Pearson's correlation coefficient  $r$  of associations between (Ardelt's, Webster's, Levenson's) wisdom dimensions and hardiness.

Wisdom dimensions		KOBASA'S hardiness dimensions			
		Challenge	Commitment	Control	Total score
<b>ARDELT</b> (n=16)	affective	0.161	0.184	-0.027	0.114
	cognitive	0.709**	0.646**	0.847**	0.815**
	reflective	0.6092*	0.651**	0.514*	0.650**
<b>WEBSTER</b> (n=42)	experience	-0.233	-0.005	-0.248	-0.168
	emot. regul.	0.036	0.096	0.259	0.153
	reflexiveness	-0.062	0.015	-0.141	-0.098
	humor	0.488**	0.482**	0.335*	0.531**
	openess	0.364*	0.293	0.256	0.415**
<b>LEVENSON</b> (n=45)		0.220	0.285	0.180	0.265

\* Correlation is significant at the 0.05 level; \*\* Correlation is significant at the 0.01 level.

**Tab. 3.** Multiple linear regression of all wisdom dimensions as hardiness predictors.

Model	Unstandardized Coefficients		Standardized Coefficients	t-value	p-value	
	B	Std. Error	Beta			
1	(Constant)	-13.506	14.215		-0.950	0.361
	Ardelt's cog. dim.	1.413	0.264	0.679	5.357	0.000
	Ardelt's refl. dim.	0.886	0.267	0.421	3.318	0.006

\* Correlation is significant at the 0.05 level; \*\* Correlation is significant at the 0.01 level.

**Tab. 4.** Pearson's correlation coefficient  $r$  of associations between (Ardelt's, Webster's, Levenson's) wisdom dimensions and psychopathological symptoms.

Wisdom dimensions		SCL-90						Total score
		Somatiz.	Hypersen.	Depr.	Anx.	Host.	Par.	
<b>ARDELT</b> (n=17)	affective	-0.173	-0.200	-0.301	-0.239	-0.442	-0.338	-0.248
	cognitive	-0.662**	-0.575*	-0.584*	-0.710**	-0.419	-0.580*	-0.600*
	reflective	-0.534*	-0.598*	-0.688**	-0.683**	-0.693*	-0.421	-0.759**
<b>WEBSTER</b> (n=45)	experience	0.465**	0.260	0.325*	0.302*	0.231	0.334*	0.387**
	emot. regul.	-0.319*	-0.324*	-0.413**	-0.425**	-0.396*	-0.199	-0.270
	reflexiveness	0.259	0.265	0.186	0.201	0.189	0.304*	0.285
	humor	-0.267	-0.333*	-0.436**	-0.367*	-0.280	-0.344*	-0.409**
	openess	-0.352*	-0.273	-0.414**	-0.368*	-0.205	-0.240	-0.362*
<b>LEVENSON</b> (n=46)		-0.032	-0.066	-0.175	-0.261	-0.225	-0.060	-0.181

\* Correlation is significant at the 0.05 level; \*\* Correlation is significant at the 0.01 level.

**Tab. 5.** Multiple linear regression of all wisdom dimensions as predictors of psychopathological symptoms.

Model		Unstandardized Coefficients		Standardized Coefficients	t-value	p-value
		B	Std. Error	Beta		
1	(Constant)	131.474	17.495		7.515	0.000
	Ardelt's kog. dim.	-1.489	0.335	-0.639	-4.447	0.001
	Ardelt's refl. dim.	-0.937	0.328	-0.411	-2.858	0.013

\* Correlation is significant at the 0.05 level; \*\* Correlation is significant at the 0.01 level.

**Tab. 6.** Pearson's correlation coefficient *r* of associations between (Ardelt's, Webster's, Levenson's) wisdom dimensions and age.

Wisdom dimensions	Age	
<b>ARDELT</b> (n=17)	affective	-0.015
	cognitive	-0.339
	reflective	-0.122
	experience	0.352*
<b>WEBSTER</b> (n=38)	emot. regul.	0.124
	reflexiveness	0.301
	humor	-0.191
	openness	-0.316*
<b>LEVENSON</b> (n=39)		-0.023

\* Correlation is significant at the 0.05 level; \*\* Correlation is significant at the 0.01 level.

dimensions reported less mental problems. In contrast, Webster's dimension of experience was significantly positively associated with some subscales of SCL-90.

In order to detect the predictive value of wisdom dimensions in relationship to SCL-90, we used the multiple linear regression (Table 5) with the dependent variable SCL-90 and with the independent variables of Ardelt's affective, cognitive and reflective dimensions, as well as with Webster's dimensions of experience, emotional regulation, reflexiveness, humor and openness, and Levenson's concept of wisdom as self-transcendence. On using the stepwise method, the best predictors of SCL-90 score appeared to be Ardelt's reflective and cognitive dimensions, which can significantly predict the level of the dependent variable [ $F(2,13)=21.35$ ;  $p<0.001$ ;  $D-W=2,10$ ]. The values of the model's coefficients are in Table 5. The value of the coefficient of determination  $R^2=0.767$ , meaning that 76% of the diffusion in the SCL-90 score can be explained by this model.

#### Hypothesis 4

As seen in Table 6, only the dimension of experience is significantly positively related to age and a borderline significant negative relationship with age can be found in the dimension of openness.

## DISCUSSION

Based on previous findings (Roháriková & Cviková 2011), we found a significantly lower mean value of the total score of wisdom according to Ardelt ( $p=0.001$ ) and Levenson ( $p=0.051$ ) in the group of psychiatric patients with psychosomatic symptoms in comparison to the healthy controls. There was a significant positive correlation of the total score of Webster ( $p=0.049$ ), Ardelt ( $p=0.000$ ) to the total score of hardiness and a significant negative correlation of the total score of Ardelt ( $p=0.000$ ) to the total score of SCL-90. The aim of the present study was to investigate what role do the individual dimensions of wisdom play in the relationship of wisdom to psychological resilience, psychopathological symptoms and so to mental health in general.

First, the comparison of the scores in Ardelt's wisdom dimensions between groups suggested that the significant difference of the wisdom score between the two groups in this concept was caused by the reflexive and cognitive dimension. We found the greatest difference in the reflective dimension which, according to Ardelt, influences the affective and cognitive dimensions. Based on these results, we suggest some possible gaps and opportunities for the development of reflective and cognitive wisdom dimensions as they are defined by Ardelt in patients with the above described results.

Based on the findings derived from comparing the dimensions of wisdom according to Webster (2003), we assume that humor, as defined by Webster, is a sign of wisdom which may have salutoprotective character, especially in concurrence with other components of wisdom. Humor is not a sufficient warranty of wisdom and it may be rather different in nature. The factors distinguishing these two groups turned out to be also their members' openness towards new experiences and their emotional regulation.

A certain discrepancy in significant differences between the groups of patients in the dimension of emotional regulation and insignificant differences in Ardelt's affective dimension can be explained by the fact that this affective dimension involves compassionate love of other people and without emotional regulation it is most probably not a satisfactory protective factor. Similarly, different results were recorded also between Ardelt's and Webster's reflective dimensions.

While with the former it was the control group which received the higher score, with the latter the psychosomatic patients scored higher. These results call attention to the different nature of the given dimensions and represent a challenge for future research on the methodology of wisdom assessment.

The considerably higher values in the dimension of experience in the group of psychosomatic patients can be explained either by a greater amount of significant life experiences with a pathogenic influence in this group or by the attitude of patients towards these life experiences. Ardel (2003, 2005) as well as Webster (2003) and Webster *et al* (2012) agree on the fact that it is the life experiences and crises which are an indispensable but not a sufficient precondition to the development of wisdom. The factors that enable the individual not only to grow as a person but also to contribute to the common good involve successful dealing with certain types of life lessons characterized by mental distancing, active coping, ability to learn from advices and life events themselves via evaluative reflection, acceptance of life's unpredictability, optimistic faith in the future and doing the morally right thing.

The difference found in self-transcendence values between the groups is on the borderline of significance and thus points to a potential positive character of desisting undue fixation to own stance, needs, problems and social self-definition as proposed by Levenson *et al* (2005).

Within the scope of our second hypothesis, we were researching the relationship between the dimensions of wisdom and hardiness as the concept of psychological resilience. We found a significant positive correlation between Ardel's cognitive as well as reflective dimension and Webster's dimension of humor to all hardiness dimensions and also to the hardiness total score. These results demonstrate the complexity of the resilience potential of these wisdom dimensions. Webster's dimension of openness towards new stimuli and solutions, significantly related to the dimension of challenge and to the total score, also seems to contribute to psychological resilience.

Similarly, Webster *et al* (2012) shows the link between wisdom and the broad measure of mental health (social, emotional and psychological well-being). Furthermore, Taylor *et al* (2011) found in their study that both the total score in 3D-WS and the SAWS scales predicted equally well psychological well-being. In our study, we focused therefore on the predictive value of individual wisdom dimensions in relationship to hardiness and also to psychopathological symptoms. An important predicting factor of hardiness as psychological resilience proved to be Ardel's cognitive and reflective dimension.

Thirdly, negative correlations of reflective and cognitive dimensions of Ardel's concept of wisdom and emotional regulation, humor and openness of Webster's concept of wisdom with dimensions in the

Symptom Checklist-90 suggest that these wisdom dimensions may play a protective role in psychopathological occurrences. The most significant negative correlation lay between the dimensions of SCL-90: depressivity, anxiety and somatization on the one hand and wisdom dimensions concerning emotional regulation, humor, openness, cognitive and reflective dimensions on the other hand. Thus the development of these wisdom dimensions in patients with the given symptoms could play an important role. The positive relationship between Webster's dimension of experience and reflectivity and the SCL-90 dimensions can probably be explained in a similar manner as their connection to hardiness. Ardel's cognitive and reflective dimensions turned out to be predictive factors of psychopathological symptoms. Both dimensions combined predicted 82% variance in hardiness and 76% variance in psychopathological occurrences. It is thus safe to assume that deep understanding of life situations and relationships as well as the ability to perceive these from various perspectives play an important role not only in coping with immediate difficult situations but also as protection from developing reactive conditional psychopathologies.

Finally, as the relationship of overall wisdom and its individual dimensions to age still remains open, we analyzed the correlations of these dimensions to age. We found a significant increase in scores of Webster's dimension of experience and a borderline significant decrease in the dimension of openness related to age. Webster *et al* (2012) found similar results, based not on simple bivariate correlations but on a curvilinear model. Experience increases till midlife and then stays stable or decreases slightly, while in contrast, openness was relatively stable up to midlife and declined thereafter. There was no evidence to link the other dimensions to age. This finding was consistent with other questionnaire measures of wisdom (Taylor *et al* 2011, Ardel 2003). But all these analyses as simple bivariate correlations are perhaps missing the real curvilinear development of wisdom. Wisdom, as predicted by Sternberg's model of wisdom as a combination of fluid and crystalized intelligence, peaks in midlife (Webster *et al* 2012). According to this curvilinear model, Webster found the same trend for humor as for openness and reflectiveness to be at the same level almost in each age category. Emotional regulation reached its peak in midlife.

The limits of the present study were that the mean age in the group of psychosomatic patients was higher than in the group of healthy subjects. In order to minimize this influence, we propose to equalize the age range in both groups. Further exploration of the age-related trend in the dimensions of wisdom and the verification of results found in this study would require a greater number of subjects. This paper represents a pilot study and further research is needed and is to be expected.

To summarize, in light of our research, the reflective and cognitive dimensions of Ardel's wisdom concept, Webster's dimensions of humor, openness and emotional regulation are the key components of wisdom separating the group of healthy controls from the group of psychiatric patients with psychosomatic symptoms and are operative as preventive factors of psychopathological occurrences. At the same time, the reflective and cognitive components of Ardel's concept and Webster's components of humor and openness also proved to be resilience factors. Ardel's reflective and cognitive dimension showed positive predicting value of psychological hardiness and a negative one in connection with the psychopathological symptoms. Besides the experience and openness dimensions we have not registered any correlation of other components to age in our study. These results point to the validation of researching wisdom and its components which may have preventive, therapeutic and/or rehabilitative potentials (Meeks & Jeste 2009; Webster *et al* 2012).

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