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ORIGINAL RESEARCH

Relation of the Psychological Constructs of Resilience, Mindfulness, and Self-Compassion on the Perception of Physical and Mental Health

Ángela Asensio-Martínez[1–3]
Bárbara Oliván-Blázquez[1–3]
Jesús Montero-Marín[1,2]
Bárbara Masluk [1–3]
Ricardo Fueyo-Díaz[2,3]
Santiago Gascón-Santos [1–3]
Francisco Gudé [1,4]
Arturo Gónzalez-Quintela[1,5]
Javier García-Campayo [1,2,6]
Rosa Magallón-Botaya[1,2,6]

[1]Research Network on Preventive Activities and Health Promotion (RedIAPP), Zaragoza 50009, Spain; [2]Health Research Institute of Aragon, Zaragoza 50009, Spain; [3]Department of Psychology and Sociology, University of Zaragoza, Zaragoza 50005, Spain; [4]Clinical Epidemiology Unit, Santiago de Compostela Hospital, Santiago de Compostela 15706, Spain; [5]Departamento de Medicina Interna, Santiago de Compostela Hospital, Santiago de Compostela 15706, Spain; [6]Department of Medicine, Psychiatry and Dermatology, University of Zaragoza, Zaragoza 50009, Spain

Correspondence: Bárbara Oliván-Blázquez
Department of Psychology and Sociology, University of Zaragoza, Violante de Hungria 23, Zaragoza 50009, Spain
Tel +34 876554547
Fax +34 976 254006
Email barbaraolivan@gmail.com

Purpose: Health factors that enhance an individual's ability to perceive and maintain health and well-being are referred to as "health assets". Of these assets, resilience, mindfulness and self-compassion are considered to be of special importance. The objective of this study was to analyze the association between these psychological constructs on the perception of physical and mental health in a general population.

Patients and methods: A descriptive and analytical cross-sectional study was conducted with 845 participating subjects. The outcome variable was the individual´s perception of physical and mental health, measured using the SF-36 questionnaire. The independent variables were: sociodemographic variables, medical information, physical activity performance (using the International Physical Activity Questionnaire), tobacco and alcohol consumption, anxiety and/or depression (using the Goldberg Anxiety and Depression Scale), resilience (using the Connor-Davidson Resilience Scale), mindfulness (with the Five Facets of Mindfulness Questionnaire Short Form) and self-compassion (using the Self-compassion scale-short form). A correlation analysis, simple linear regression and multiple linear regression were carried out, controlling for the influence of the distinct independent variables.

Results: The constructs of resilience, mindfulness and self-compassion are significant, in the perception of both physical and mental health. Other factors appearing in the multiple regression are gender, age, educational level, physical activity and tobacco consumption, in a positive or negative sense.

Conclusion: The study of these associations is fundamental for the understanding of underlying regulation processes of healthy lifestyles in the general population.

Keywords: perception of physical and mental health, resilience, mindfulness, self-compassion

Introduction

Establishing a definition for the concept of complete and globally accepted health is clearly a challenge since societal changes have modified the concept of health and wellbeing over recent decades based on current knowledge, beliefs, and values. The 1946 WHO definition, which considers health to be the state of physical, mental, and social wellbeing and not only the absence of disease or infirmity,[1] began the movement of change towards a psychological, multifaceted, and holistic conceptualization of health that is not exclusively biological.[2,3]

Based on the concept of health, its determinants have been studied. These health determinants may be defined as the set of personal and social, economic and

environmental factors that determine the state of health of individuals or populations.[4] One of the most widely used models for the analysis of these health determinants was created by Dahlgren and Whitehead[5] and it presents the main determinants of health as a range of concentric hierarchical layers in which each of the outer layers determines the successive central layers. Here, individuals are located, with modifiable markers such as age, gender, and genetic predisposition, while remaining sensitive to the influence and interactions (positive or negative) of a series of modifiable factors. Of these factors, those that enhance the ability of the individual, community and population to perceive and maintain health and wellbeing are defined as "Health Assets", according to the theory of salutogenesis.[6] These factors may include resilience,[7,8] conscious attention[9] or mindfulness, and self-compassion.[10] Resilience has been studied as a health asset,[7,11–13] and diverse studies have specified its action mechanism which is related to stress management.[14,15] Mindfulness and self-compassion, which may also be considered health assets,[16] are based on stress management. Furthermore, diverse studies have described a link between resilience, mindfulness and self-compassion.[17,18]

Resilience may be defined as the process of overcoming the negative effects of risk exposure, successful coping with traumatic experiences, and avoiding negative trajectories associated with risk.[19] Health resilience has been conceptualized as the ability to maintain good health amidst great adversity.[7,8] Research studies carried out on patients with various pathologies, both physical[20–27] and mental[28–32] have demonstrated the positive effects of resilience in the prevention, treatment, and quality of life.

The concept of mindfulness refers to attention or awareness and being present.[33] In the current psychology, mindfulness is considered a psychological resource to improve awareness, and to effectively respond to mental processes that contribute to psycho-emotional stress and maladaptive behaviors.[9] Sternberg[34] interprets mindfulness as a cognitive style, rather than a personality trait or skill. It is considered to be a trainable skill, with this training being associated with the regulation of "top-down" emotions over the short term, and "bottom-up" emotions over the long term.[35] Ample scientific evidence has confirmed the efficacy of various therapies that are based on mindfulness for the treatment of different aspects of health as well as physical and mental disorders.[36–48]

Compassion may be defined as a psychological construct that involves cognitive, affective, and behavioral[49] characteristics, in acknowledgment of one's own anguish or that of

others, and as an attempt to alleviate it. It has been studied in terms of receiving the compassion of others, and as compassion for oneself (self-compassion).[50] Self-compassion involves offering oneself the same care, comfort, and serenity that one naturally gives to a loved one who is suffering. Self-compassion and compassion for others are relevant in the field of emotional development, specifically in coping and emotional regulation. Instead of substituting negative thoughts for positive ones, new emotions are generated that accept the negative, permitting a clearer understanding of the situation, and implementation of effective and appropriate actions.[10] Various studies have analyzed the efficacy of self-compassion in the improvement of different aspects of health and physical and mental diseases,[51,52] including behaviors that promote health,[53] quality of life,[54] self-esteem,[55,56] and well-being.[57] Compassion is considered to be a trainable skill that facilitates change.[58]

The study of the relation of these psychological constructs on the perception of physical and mental health has not been examined in depth in a non-clinical population, but the main interest when studying these psychological constructs and their relationship with perception of physical and mental health lies in their relation with stress management,[14–16] and coping, based on an increase in positive emotions,[59,60] and, therefore, their relationship with health-promoting behaviors. It should be noted that these constructs are trainable,[13,58,61] and thereby, may be relevant when developing lifestyle modification programs.[62] Therefore, the objective of this study was to analyze the relationship of psychological constructs such as resilience, mindfulness, and self-compassion on the perception of physical and mental health in the general population.

Materials and Methods
Design: Cross-Sectional Study
Sample and Sample Size
This study was conducted in the municipality of A Estrada, Galicia (Spain), with an adult population (18 years and older) of 18,897 residents at the onset of the study in 2012. The inclusion criteria were: 1) population aged 18 years and older; 2) proficiency in spoken Spanish or ability to communicate; 3) provide informed consent. The exclusion criterion was the presence of severe chronic disease (dementia, mental retardation, cerebrovascular disease, terminal cancer, etc.).

The sample size required to make inferences for each construct was calculated. In this type of study, given that the correlations are average-high between the instruments,

the sample size is not very large. However, based on past studies,[28,63–65] using a 95% confidence level, an estimation precision of 3.5 points and assuming estimation rates of 50% (a value that maximizes the sample size), a total of 784 individuals are needed. However, we believe that the incomplete data rate from incomplete questionnaires would be quite high, approximately, 50%, and therefore, the required sample size would increase to 1568 individuals. So, a very large number of consent forms were signed, resulting in a sample of 845 participants. The effect size, measured using Cohen's d, in these cases, is for all of the analyzed variables over 0.8.

These patients were randomly selected from the Healthcare Registry. A computer program (sample function in R) generated a random sample of an equal number of subjects, stratified by age group (in 7 categories, every 10 years). Of the initially selected sample of 3500 subjects, 639 could not be contacted, 134 lived outside of A Estrada, 19 did not have healthcare coverage, and 84 were deceased. Of the remaining eligible subjects (n=2624), 394 were excluded due to failure to meet the inclusion criteria. The exclusion criteria were cognitive deterioration, immobility, ambulatory problems, active neoplasia, addiction, terminal diseases, cerebrovascular disease, severe psychiatric diseases, social disorders, pregnancy, Parkinson's, and sensory problems. 714 subjects refused to participate and 1516 signed the informed consent form, of which 845 participants completed the questionnaire.

Variables and Instruments Used

The outcome variable of the study was the perception of individual physical and mental health, measured by the SF-36 questionnaire. This questionnaire is self-administered and includes 36 items[66] measuring 8 aspects of health: physical function, physical problems, pain, general health, vitality, social function, emotional problems and mental health. In addition, it includes an item termed Declared Evolution of Health. The 8 dimensions define 2 main health components: general physical and general mental aspects, in which scores above or below 50 indicate higher or lower health statuses, respectively, as compared to the average population. The items are scored on a Likert scale ranging from 1 to 3, 5, or 6, depending on the type of item. The 8 scales range from 0 to 100, and higher scores indicate better health. The Spanish version of the questionnaire was used, having a maximum Cronbach's alpha of 0.7 on all of the dimensions, except for social function

(α=0.45).[67] The Cronbach's alpha obtained in this study was 0.860; therefore, the reliability may be considered to be good.

The independent variables of the study are:

- Demographic and social data: gender, age, civil status, education level, and work history. These were collected through prepared questions.[68]

- Medical History: Information on previous illnesses was collected by reviewing the patient's medical history.[69]

- Physical Activity: The International Physical Activity Questionnaire (IPAQ) was used in its abridged form (9 items), translated and validated in Spanish.[70] Subjects answered questions about their physical activity over the past 7 days. In the reliability analysis of the short version of IPAQ, 75% of the correlation coefficients observed were approximately 0.65, with a range of 0.88 and 0.32.[71] When classifying the subjects in order to obtain continuous results, the data were converted to METS (measurement unit of metabolic index) adding the duration (in minutes) and the frequency (in days). The IPAQ divides subjects into 3 levels or categories of physical activity: low, moderate, and high.

- Smoking: This was measured as the number of cigarettes regularly consumed every day. Subjects who smoked at least one cigarette a day were considered smokers, and subjects who had given up smoking for at least 1 year were considered ex-smokers.[69]

- Alcohol consumption: This was measured in Standard Drinking Units (UBE) consumed weekly, and the grams of alcohol consumed per week was subsequently calculated. Individuals were classified in 4 alcohol consumption risk groups: 0–9 grams/week, 10–139 gr/wk, 140–279 gr/wk, and 280+ gr/wk.[72] This variable was analyzed in this way for the entire sample, regardless of gender.

- Depression and Anxiety: The Goldberg Anxiety and Depression Scale was used in its Spanish version, validated by Montón et al[73] having a sensitivity of 83.1% and a specificity of 81.8%. The Cronbach's alpha obtained in this study was 0.568 for the depression subscale, and 0.503 in the anxiety subscale; therefore, the reliability may be considered to be poor. It consists of two self-administered scales of 9 items each. The options for each answer are yes or no. Scores above 2 on the depression scale, and above 4 on the anxiety scale were considered probable cases of depression and anxiety, respectively.[74]

- Resilience: This variable was evaluated using the Connor-Davidson Resilience Scale (CD-RISC), which is a self-administered questionnaire consisting of 10 items.

These items correspond to a Likert-type scale of 5 answer choices, ranging from 0 (never) to 4 (almost always). The final score is the sum of the answers from each item (ranging from 0 to 40) with higher scores indicating higher resilience levels. In this study, the Spanish version of this scale created by Soler Sánchez et al[75] was used, which has an adequate internal consistency (α=0.87). The Cronbach's alpha obtained in this study was 0.860; therefore, the reliability may be considered to be good.

- Mindfulness: The shorter Dutch version of the Five Facets of Mindfulness Questionnaire (FFMQ-SF) was used. This version includes 24 items[76] and is validated for the clinical population (with anxiety and depression symptomatology). However, for a general population of Europeans having good psychometric properties (α>0.70) in all dimensions, a direct translation of the items from the original FFMQ validated in Spanish by Cebolla et al[77] was used. The Cronbach's alpha obtained in this study ranged between 0.65 ("Observing" factor) and 0.80 ("Acting with awareness" factor); therefore, the reliability may be considered good and acceptable.[78] The items are responded to on a scale from 1 (never or very rarely) to 5 (very often or always). The five facets of mindfulness were subsequently evaluated: observation, description, act aware, not judging internal experiences, and not reacting to internal experiences. A summative general score of items from 24 to 120 was obtained, taking into the account the presence of items scored in an inverse manner, and an individual score was obtained from each subscale of items 5 to 25, except for the "observe" dimension ranging from 4 to 20. Higher scores indicate greater capacities for mindfulness.

- Self-compassion: This was evaluated using the Self-compassion scale-short form (SCS-SF), which is a self-administered questionnaire consisting of 12 items. It is responded to using a Likert-type scale, from 1 (almost never) to 5 (almost always). Six subscales are also evaluated, including kindness to oneself, common humanity, and mindfulness, and a high score suggests a high level of self-compassion. On the other hand, on the subscales of self-judgment, isolation, and over-identification, a high score refers to a low level of self-compassion. The Spanish version validated by García-Campayo et al[79] was used, having an internal consistency of (α=0,85). The Cronbach's alpha obtained in this study was 0.768; therefore, the reliability may be considered to be acceptable.

Procedures

The recruitment of subjects took place between November 2012 and March 2015. All of the randomly selected subjects were initially contacted by mail and subsequently by telephone to explain the study and refer them to the health center. If they decided to participate, they were assigned an appointment at which they filled out a paper data collection notebook in the presence of a research assistant who also explained the study, obtained informed consent, answered questions, and collected the questionnaires. Physicians were asked to complete a questionnaire based on the subject's clinical history. Each patient was then assigned a random anonymous identification number, to ensure data confidentiality.

Statistical Analysis

First, a descriptive analysis of the sample was conducted to obtain the mean and standard deviation for the quantitative variables, and the frequency and percentages for the qualitative variables. Due to the large sample size, parametric tests were deemed appropriate, since in large samples even if the data distribution is not normal, statistics tend to be normal.[80] To analyze the relationship of the psychological constructs on the dependent variables of physical and mental health perceptions, a correlation between the quantitative variables was performed using the Pearson Correlation Coefficient. Based on the significant correlations found, a simple linear regression was carried out with the variables, to parse out the significance and potential predictor capabilities of the independent variables. Finally, a multiple linear regression was performed, controlling for the influence of the various independent variables,[81] including the interaction between the variables of gender and alcohol consumption, since it was considered that they may be of relevance in the model if consumption differs based on gender. The following variables were categorized into two categories to be included in a multiple regression:[81] Civil status (with and without partner), education level (with and without studies), Tobacco (non-smoker/smoker), IPAQ (low physical activity and high physical activity), alcohol (abstinent and intense consumer). All of the variables were simultaneously introduced in the regression models to obtain a better fitting result upon statistical analysis. Standardized slopes were used in order to compare the explanatory power of the different variables introduced in the regression models since these variables do not always use the same unit of measure. The subscales of the measures of mindfulness and self-compassion were used in the analyzed models.

Data from the questionnaire were statistically analyzed with the SPSS20 and AMOS v20 statistical packages. All

significance levels were established at 0.05. Scales without data were eliminated.

Ethical Considerations

The study was approved by the Ethical Research Committee of Santiago de Compostela, Spain (2012–025), and by the Ethical Research Committee of Aragon, Spain (15/2017). The study was performed in accordance with the Helsinki Declaration. All of the subjects completed an informed consent form, and their data were anonymized.

Results

Tables 1 and 2 present the sample characteristics based on various sociodemographic variables, and physical and mental health, respectively. Table 3 presents the values of the analyzed psychological constructs. It is evident that the sample presents average values on resilience and the facets of observe, and not reacting to the mindfulness paradigm (evaluated by FFMQ-SF), and high-average values on the remaining mindfulness facets and on self-compassion.

Table 4 presents the significant correlations from the bivariate analysis, and from the simple linear regression between the psychological constructs of resilience,

Table 1 Sociodemographic Sample Characteristics[a]

Age[b] (range: 18–88)	49.16 (16.97)
Gender, male*	386 (43.8)
Civil Status*	
Married	558 (63.3)
Widowed	63 (7.1)
Separated/Divorced	58 (6.6)
Single	203 (23.0)
Education Level*	
No education	146 (16.6)
Primary Education	382 (43.4)
Secondary Education	225 (25.5)
College Education	129 (14.5)
Work Status*	
Working	382 (43.4)
Temporary disability	15 (1.7)
Unemployed	150 (17.0)
Housekeeper	65 (7.4)
Retired	212 (24.1)
Student	43 (4.9)
Other	15 (1.7)
Working, for at least one year*	744 (84.4)

Notes: [a]n=882; [b]mean (SD); *Frequency (percentage).

Table 2 Physical and Mental Health Characteristics of the Sample[a]

Physical Health	
SF-36[b,c]	46.42 (9.74)
Smoker*	
No	457(51.8)
Ex-smoker	235(26.6)
Yes	190(21.5)
Alcohol*	
0–9 gr/week	328(37.2)
10–139 gr/week	355(40.2)
140–279 gr/week	120(13.6)
280+ gr/week	79(9.0)
Physical Activity*	
Low	328(37.2)
Moderate	327(37.1)
High	227(25.7)
Comorbidity*	
Obese or overweight	261 (29.5)
Hypertension	230 (26.1)
Diabetes mellitus (type 2)	85 (9.6)
Hyperlipidemia	224 (25.4)
Myocardial ischemia	32 (3.6)
Heart failure	14 (1.6)
Renal failure	13 (1.5)
Hepatic disease	43 (4.9)
Asthma	55 (6.2)
Chronic obstructive pulmonary disease	11 (1.2)
Rheumatic disease	12 (1.4)
Cardiovascular disease	13 (1.5)
Osteoporosis	23 (2.6)
Cancer	36 (4.1)
Psoriasis	33 (3.7)
Thyroid disease	65 (7.4)
Migraines	50 (5.7)
Mental Health	
SF-36[b,c]	48.65 (11.61)
Anxiety, yes*	193 (22.0)
Depression, yes*	219 (24.9)
Previous episode of depression, yes*	123 (13.9)

Notes: [a]n=882; [b]Mean (SD); [c]Summative standardized component of SF-36; *Frequency (percentage).

mindfulness, and self-compassion, with the perception of physical and mental health. As previously mentioned, a linear association exists between the changes in the scores between physical and mental health perception, and the subsequent psychological constructs: higher values in resilience; the dimensions "describe", "act aware", and "non-react" of mindfulness; are related to better physical health perception. Higher values in the "self-judgment"

Table 3 Psychological Characteristics of Sample

	N	Mean (SD)	Range[a]
Resilience	828	26.87(7.21)	0–40
Mindfulness			
FFMQ-SF			
Observe	778	13,20 (3.59)	4–20
Describe	795	16.47(4.31)	5–25
Act Aware	744	20.00(3.71)	5–25
No judgment	773	16.57 (4.07)	5–25
No reaction	733	12.98(3.31)	5–25
Self-Compassion			
Kindness to oneself	791	3.20(0.99)	1–5
Common Humanity	778	3.08(1.00)	1–5
Mindfulness	797	3.60(1.05)	1–5
Self-judgment	781	2.95(1.11)	1–5
Isolation	791	2.83(1.19)	1–5
Over-identification	792	3.16(1.72)	1–5

Note: [a]Range: minimum to maximum of questionnaires.

dimension implying lower levels of compassion, since they had a negative Pearson value, are related to a poorer physical health perception. As for mental health perception, a linear association exists for the following psychological constructs: higher values in resilience; the dimensions "describe", "act aware", "non-judgment", and "non-react" of mindfulness; and the dimensions of "self-kindness", "mindfulness" of self-compassion are related to better mental health perception. While higher values in "self-judgment" "isolation", and "over-identification" of self-compassion, which imply lower levels of compassion, given that they have a negative Pearson value, are related to a poorer mental health perception. There is no apparent significant correlation between the remaining variables.

The results of the multiple linear regression may be seen in Tables 5 and 6. The results presented in Table 5 reveal that the obtained model explains 21% of the variability in the physical health perception. Controlling for the influence of the variables with regards to one another, the influence is significantly positive for the variables of gender ($p<0.01$), education ($p<0.01$), physical activity ($p<0.05$), for the psychological construct of resilience ($p<0.05$), the dimension "act aware" in the psychological construct of mindfulness ($p<0.01$), and it is significantly negative relation with the variables of age ($p<0.01$), and the "mindfulness" dimension of the psychological construct of self-compassion ($p<0.01$).

The results presented in Table 6 show that the obtained model explains 30% of the variability of the mental health perception. Controlling for the independent variables, the influence is significantly positive for the psychological construct of resilience ($p<0.05$), the dimension "act aware" of the psychological construct of mindfulness ($p<0.05$), the dimension "no judgment" of the psychological construct of mindfulness ($p<0.01$), the dimension "kindness to oneself" of the psychological construct of (self) compassion ($p<0.01$), and it is significantly negative relation with the variables of smoking ($p<0.05$) and the dimension "describe" of the psychological construct of mindfulness ($p<0.05$).

The gender-alcohol consumption interaction does not appear in either of the tables since it is not significant in any of the models. In the case of Table 5, the coefficient was 0.480 (p value = 0.857) and for Table 6, the interaction coefficient was −0.179 (p value = 0.965).

Discussion

The results of this study support the idea that the perception of one's health is a multidimensional concept[82] that is associated with variables such as age, educational level, physical exercise, smoking, and also with the psychological constructs of resilience, mindfulness and self-compassion, supporting the belief that they may be considered "health assets".[7,11–13,16] However, more research is necessary in order to determine their role as health assets and in the adoption of healthy lifestyles. Resilience has been the most consistent factor in terms of its direct relationship with the perception of physical and mental health in all of the analyses carried out, while the relationship with all of the mindfulness and (self) compassion dimensions of perceived physical and mental health has not been fully demonstrated. The relevant role of resilience may be explained by its being fostered by internal factors such as acceptance (simultaneously related with the capacity of mindfulness and compassion), active coping, perspective-taking, optimism, and spirituality,[83] which may be related to both health perception and the adoption of healthy lifestyles.

Upon analysis of the correlational data on physical and mental health perception, to increase in resilience levels is linked to an increase in perceived physical and mental health. These results correspond with those from other studies such as those of Farber et al,[26] Beutel et al[28] Haddadi and AliBesharat[32] and Hjemdal et al.[84] These similar results were obtained with respect to all of the dimensions of mindfulness, with the exception of the "observe" dimension. Aguado et al[85] claimed that the "observe" dimension is

Table 4 Bivariate Correlation and Simple Linear Regression Between Physical and Mental Health Perception and Psychological Constructs

Variable	N	Mean	Standard Deviation	r	P-value
Physical Health (SF-36)					
Resilience	828	26.87	7.21	0.18**	0.03
Self-Compassion					
Kindness to oneself	791	3.20	0.99	0.04	
Common humanity	778	3.08	1.00	0.02	
Mindfulness	797	3.60	1.05	−0.00	
Self-judgment	781	2.95	1.11	−0.07*	0.00
Isolation	791	2,83	1.19	−0.04	
Over- identification	792	3.16	1.72	−0.04	
Mindfulness					
Observe	778	13.20	3.59	0.04	
Describe	795	16.47	4.31	0.14**	0.02
Act aware	744	20.00	3.71	0.07*	0.00
No judgment	773	16.57	4.07	0.01	
No reaction	733	12.98	3.31	0.10*	0.01
Mental Health (SF-36)					
Resilience	828	26.87	7.21	0.34*	0.11
Self-Compassion					
Kindness to oneself	791	3.20	0.99	0.30**	0.09
Common humanity	778	3.08	1.00	0.05	
Mindfulness	797	3.60	1.05	0.31**	0.09
Self-judgment	781	2.95	1.11	−0.16**	0.02
Isolation	791	2.83	1.19	−0.34**	0.11
Over-identification	792	3.16	1.72	−0.36**	0.13
Mindfulness					
Observe	778	13.20	3.59	−0.03	
Describe	795	16.47	4.31	0.18**	0.03
Act aware	744	20.00	3.71	0.30**	0.09
No judgment	773	16.57	4.07	0.33**	0.11
No reaction	733	12.98	3.31	0.25**	0.06

Notes: *p<0.05; **p<0.01; P value obtained by simple linear regression. The higher the score on the resilience scales, the five facets of mindfulness and the compassion subscales of kindness, common humanity and mindfulness, the higher the score on the psychological construct. Higher values in the compassion subscales of self-judgment, isolation, and over-identification imply lower scores on the psychological construct of compassion.
Abbreviation: r, Pearson Correlation.

sensitive and measures the construct correctly when using a sample of meditators, so it may not be useful in evaluating mindfulness in individuals without meditation experience. The obtained results concur with previous studies on therapies based on mindfulness,[86–90] that emphasize emotional regulation as an explanatory element.

With respect to the self-compassion construct, the results obtained in this study reveal that only the "self-judgment" dimension is related to the variation in physical health perception. This is why being hostile, degrading, and critical to oneself or with aspects of oneself, is

associated with a lower perceived physical health status, in accordance with the study of Hall et al[91] Meanwhile, the remaining dimensions are related to the variation in the mental health perception, with the exception of the "common humanity" dimension. These findings are consistent with prior studies conducted on compassion-based therapies[10,22,57,63,92,93] which explain the results based on the generation of new positive emotion. However, some studies have related common humanity with positive emotions such as happiness;[94] therefore, additional studies are necessary.

Table 5 Potential Explanation of Independent Variable of Study with Regards to Physical Health Perception (SF-36)

Independent Variables	$R_{y.123}$	$R^2_{y.123}$	F (Df$_1$/Df$_2$)	P^a
	0.45	0.21	7.83(19/577)	<0.001
	R	Beta	t	p^b
Intercept		38.03	7.41	<0.001
Age	−0.35	−0.24	−5.10	<0.001
Education	0.32	0.20	4.37	<0.001
Physical Activity	0.13	0.09	2.28	0.023
Resilience	0.17	0.12	2.56	0.011
Mindfulness				
Act aware	0.11	0.12	2.72	0.007
Self-compassion				
Mindfulness	−0.01	−0.13	−2.70	0.007

Abbreviations: $R_{y.123}$, Multiple correlation coefficient; $R^2_{y.123}$, Coefficient of multiple determination; p^a, P value for associated variance with regression; R, raw correlation; Beta, standardized slope; p^b, Wald test results P value.

Table 6 Potential Explanation of Independent Variables of Study with Regards to Mental Health Perception (SF-36)

Independent Variables	$R_{y.123}$	$R^2_{y.123}$	F (Df$_1$/Df$_2$)	P^a
	0.55	0.30	13.10 (19/577)	<0.001
	R	Beta	t	p^b
Intercept		26.39	4.62	<0.001
Smoking	−0.06	−0.09	−2.39	0.017
Resilience	0.38	0.21	4.66	<0.001
Mindfulness				
Describe	0.17	−0.09	−1.98	0.048
Act aware	0.31	0.10	2.41	0.016
No judgment	0.34	0.18	3.98	<0.001
No reaction	0.21	0.08	1.90	0.058
Self-Compassion				
Kindness to oneself	0.30	0.13	2.89	0.004

Abbreviations: $R_{y.123}$, Coefficient of multiple correlation; $R^2_{y.123}$, Correlation of multiple determination; p^a, P value for the associated variance with regression analysis; R, raw correlation; Beta, standardized slope; p^b, P value for Wald test result.

In the model obtained for physical health perception in the general population, which explains 21% of the variance, the significant variables (age, education level, physical activity, resilience, mindfulness) ("act aware dimension", and self-compassion (mindfulness dimension)) agree with the existing literature. Age has a highly negative influence on physical health perception, reflected in the universal processing of natural aging,[95,96] and is accepted in the literature.[97,98] Previous studies have confirmed the positive relation between an individual's physical health perception and education level,[99] as well as with those who engage in physical activity since people who are physically active fare better than those who are not.[95,100] The psychological construct of resilience is positively related to perceived physical health and can be explained by the improvement of self-care and healthy living habits.[23,101] Mindfulness has an explanatory capacity, in a positive sense, through its "act aware" dimension which can also offer explanations through the non-mechanization of activities, the improvement of healthy living habits and behaviors.[102] In other words, this means being conscious and present in the moment, as opposed to merely going through the motions. Similarly, self-compassion has an explanatory capacity through its "mindfulness" dimension, but negatively influences physical health perception which contradicts the existing literature on mindfulness-based therapies for physical pathologies. However, Hall et al[91] found that the "over-identification" and "mindfulness" dimensions were not predictors of physical wellbeing. This may be due to the characteristics of the SCS-SF since the internal consistencies were low in the original version of Raes et al[103] and in the validated Spanish version of García-Campayo et al.[79]

In the explanatory model on mental health perception, which explains 30% of the variance, the significant variables (in a positive sense) were resilience, mindfulness (dimensions "act aware", "no judgment", and "no reaction"), and self-compassion (dimension "kindness to oneself"). Smoking and the "describe" mindfulness dimension were the variables that negatively relate to the perception of mental health. The role of smoking corresponds with that found in the existing literature.[104,105] Resilience presents an elevated explanatory capacity on mental health perception, as corroborated by previous studies[82] which reflect the protective capacity of resilience on perceived mental health. As for the mindfulness construct, prior studies have also supported programs based on mindfulness in the general population.[106,107] However, the negative association with the "describe" dimension indicates that individuals who describe or label their internal experiences with words have a poorer perceived mental health, suggesting that labelling thoughts does not always lead to

a positive mental status. Finally, only through the "kindness to oneself" dimension does self-compassion explain that individuals capable of demonstrating kindness to themselves without judgment have a better perceived mental health. This is in line with US studies conducted by Hall et al[91] Terry and Leary[63] and Van Damm et al[108] which analyzed mental well-being, autoregulation and compliance with medical recommendations, and quality of life, respectively.

This study can be considered to have high external validity since its sample size is representative of a Spanish population in the analyzed parameters, smoking, alcohol, physical exercise, and past depression history.[72] However, it does have certain limitations. The primary limitation is its cross-sectional design, which does not permit the establishment of causal relationships between the variables, but does allow for the study of linear relationships and the association of the studied variables. Another limitation is the fact that the variables of civil status, education level, physical activity level, tobacco use and alcohol consumption have been categorized into two categories so as to introduce them into the regression analysis. This was done to maintain the power of the statistical analysis, by introducing a large number of variables, and to focus on the confluence relationship with the psychological variables. Another limitation is the use of the evaluation scales for mindfulness and self-compassion, which can be difficult to understand if the subjects are not fully aware of their ability to experience the present[109] or able to analyze their emotions. Experience in meditation can influence not only the results of the used scales but also the health-related measures. Ultimately, it recommended that future studies use these variables in their analysis.

Conclusions

In conclusion, the perception of one's health, both in physical and mental terms, may be correlated to age, educational level, physical exercise, smoking and other constructs such as resilience, mindfulness, and self-compassion. In each of the explanatory models, these dimensions were significant; therefore, they may be considered to be health assets. Resilience was found to be the most consistent factor in terms of its direct relationship with the perception of physical and mental health in all of the analyses carried out.

Abbreviations

IPAQ, International Physical Activity Questionnaire; CD-RISC, Connor-Davidson Resilience Scale; FFMQ-SF, Five Facets of Mindfulness Questionnaire short form; SCS-SF, Self-compassion scale-short form.

Ethics Approval and Consent to Participate

The study was approved by the Ethical Research Committee of Santiago de Compostela, Spain (2012-025), and by the Ethical Research Committee of Aragón, Spain (15/2017). The study was performed in accordance with the Helsinki Declaration. All of the subjects completed an informed consent form, and their data were anonymized.

Availability of Data and Material

Data supporting the findings presented in the current study will be available from the corresponding author upon request.

Disclosure

The authors report no conflicts of interest in this work.

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