Sense of coherence and its connections with BMI and weight-related beliefs and attitudes

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Abstract

Background: Several previous researches have tried to connect the sense of coherence (SOC), as stress coping resources measurement, with the nutritional status and food choices of a person. They gave mixed results regarding the relation SOC/BMI, but showed the real potential of SOC in the filed of healthy nutrition promotion.

Aim and Objectives: The aim of this paper was to evaluate the sense of coherence (SOC) score in Romania and to investigate its eventual connections with the weight status evaluated by the body mass index, and other related attitudes and believes.

Methods: a cross sectional study investigating by means of correlation tests and regression the links of the sense of coherence score with demographical characteristics, BMI, weight variation, weight perception, self evaluated health and other items related with weight and diet control. The participants were a random selected sample of 970 Romanians

Results: The SOC score is correlated significantly with gender, socio-economical status, self perceived health, the preoccupation for having a normal weight, the perception of the relation health-normal weight and with the perceived difficulty in maintaining a constant weight. The regression shows that the body mass index is a positive determinant of the SOC score (B =0.051)

Conclusions: The SOC score has close relations with healthy conceptions regarding body weight and healthy eating, but also shows a surprising connection with BMI, higher weights leading to small SOC rises. SOC confirms its health promotion utility in the nutrition field.

Keywords: sense of coherence, body mass index, health promotion, eastern europe

Introduction

Overweight and obesity are serious health problems threatening personal well being and creating huge problems for health systems world wide. Several explanations have been given for the present trend of weight ascension that had led to an "epidemics" of obesity ("Globesity").[1] From sedentary lifestyle, to caloric concentrated food and continuous stress, there are many reasons for the increasing body mass index of modern man. Food ingestion is driven by a multitude of factors and stress or mood can exert an important influence. Food can be perceived as a de-stressor factor. The influence of stress on food choice is complex not least because of the various types of stress one can experience. The effect of stress on food intake depends on the individual, the stressor and the circumstances. Food intake is frequently high in depressive and anxious patients. [2,3,4] Mood can also influence food intake. For example, depressed mood appears to influence the onset and severity of food cravings.[5,6,7]

Taking in account the obvious links between stress and mood on one hand and food consumption and body weight on the other hand, we tried to find possible links between the Antonovsky`s sense of coherence and BMI (body mass index) together with other weight-connected attitudes. The sense of coherence (SOC) theory has been put in place in the last decades of the XX-th century by Aaron Antonovsky. [8,9] The calculated SOC score is generally viewed as a measure of stress coping capacities of an individual. In addition, earlier research has demonstrated that SOC has a strong negative correlation with anxiety and depression and a strong positive correlation with optimism. [10,11] A person with a strong SOC is less likely to perceive many stressful situations as threatening and anxiety provoking than one with a weak SOC.[12, 13] There are not given figures defining a high or a low SOC score, but the general rule is that higher the score, the bigger the stress coping attitudes. A great number of studies showed that a high SOC score is also connected with healthier behavior choices and the present study wanted to investigate if this is true regarding the weight conceptions and attitude of a person.

Since SOC can be raised by appropriate measures, [14,15,16,17] its eventual links with food intake and body weight could be a useful tool in the continuous fight of preventing obesity and diminishing the consequences of overweight. Several previous research have tried to connect SOC with the nutritional status and food choices and gave mixed results regarding the relation SOC/BMI. [18,19,20] However, persons with higher SOC make healthier food choices for themselves and for their children, [21,22] the sense of coherence being seen as an useful tool for health promotion. [23]

Although the SOC score was evaluated in a great number of countries,[12] in Romania, no research based on Antonovsky`s sense of coherence has been carried out, either related with nutrition, or with other problems of interest. In the present study we had in target to evaluate the SOC score in Romania and to investigate its eventual connections with the weight status and other related attitudes and believes.

Methods

The present cross sectional study was carried out in 2008-2010. We randomly selected, during regional conferences, 45-50 family doctors from each great province (Ardeal, Moldova, Muntenia) of Romania and asked them to participate. Only 35 doctors per province accepted in

the end to participate to the investigation. Each doctor then randomly selected from his (hers) private practice registers 10 persons asking for collaboration, the sample finally formed having 970 members. They were asked to answer to a questionnaire either by phone or email, or on paper, during a current visit to their MD. The questionnaire was structured in 2 parts: the first with demographical, anthropometrical and weight perception/importance questions; the second evaluating the SOC score. This was assessed using the 13-item version of the Orientation to Life Questionnaire devised by Antonovsky, [13,24] professionally translated into Romanian. The questions ask the respondents to check their level of agreement with items on a seven- point semantic differential scale with two anchoring phrases

a. The questionnaire and the variables

The questions related to body weight and weight/food intake subjective importance concerned: the subjective perception of body weight, the degree of preoccupation for having a healthy diet, the preoccupation of having a normal weight, the perceived influence of a normal weight on health, the perception of the eat-weight connection ("do you think that your weight accurately reflects how much you eat?"), the perceived difficulty in maintaining a constant weight through time (all of them measured on a 5-item Likert scale). In the final analysis, a new variable, the "weight perception" was computed by calculating the difference between the self evaluation of the BMI category and the actual BMI category. Individuals were divided in 2 categories: "0", were there is a concordance between perception and reality and "1" were there are differences between the two (either an over, or an under evaluation). The socio-economical status answers, originally having 5 levels, were collapsed into two categories: "SES 1-0", meaning the medium socio-economical level versus the low and "SES 2-0", meaning the upper level versus the low one.

The BMI of each person was calculated by the family doctors, from data existing in personal files. The BMI variation through time was evaluated by direct answer and/or by the figures from the personal file.

b. Statistics

By means of the SPSS ver. 14.0, there have been carried out: a description analysis of the SOC score, detailed on age group, gender and BMI group, correlation tests between the SOC score and each other variable and linear multivariate regression (forced enter method) having as dependent variable the SOC score and as independents, all those taken in account in the previous correlation tests. The threshold for the statistical significance was considered .05.

Results

The mean values of the SOC score for women and men, on each age group and each level of BMI are presented in table 1.

(insert table 1)

The average value of the SOC score was 59,1, with a standard deviation of 10,72, a minimal value of 29 and a maximal, of 88. The values are similar than those found in other countries. [12] The average value of the BMI was 24, with a standard deviation of 4,3, a minimal value of 16 and a maximal, of 38. The highest percents of underweighted and normally weighted are in the 18-24 years group, of overweighed, in the "35-44" group and of the obese, in the "45-54" group. We cannot draw conclusions, since this is a cross sectional study, but we can observe

that the ascension of weight is closely and positively related to age (correlation coefficient age-BMI = .566).

The correlation coefficients of the SOC score and the other variables taken in account and their significance are figured in table 2.

(insert table 2)

Table 3 presents the results of the multiple linear regression ("enter" method).

(insert table 3)

The results of the initial linear regression analysis showed that there was multicollinearity between age and weight variation, and BMI, and between the two levels of SES (resulting from the analysis of the tolerance and variance inflation factors (VIF)). Because age, weight variation and SES 1-0 were not correlated in the previous analysis (table 2) with SOC, we dropped the above variables and kept in regression just the BMI value. The problems of multicollinearity were thus solved.

Discussions

The SOC value shows no direct correlation with age. Our evaluation, as other studies, shows rather heterogenic values during life-time, contradicting what other authors have found [25,12], that during lifetime SOC has the tendency to grow. Maybe the explanation lies in the rather agitated and changeable history of the last decenies of Romania, which has, for sure, influenced the resilience of people belonging to different generations.

A significant correlation of SOC is with gender. Women have a significant lower value than men, finding present also in other studies carried out in other countries.[25-28] The finding comes in contrast with studies showing non important gender differences in the SOC score.[29] It deserves a further analysis, since the discrepancy can be the result of deep diverse level inequities between men and women in the Romanian society. It also rises questions regarding differences in stress coping, in adopting health preventive behaviors, in the general relation with life and family, essential questions taking in account that women play in Romania the main role in carrying and educating children.

As confirmed by Antonovsky himself and by studies carried out through time, the SOC score is higher when the socio-economic status is high. [30] But the difference is noticeable in our group just between persons with high SES and those with a low SES, and not between persons with a medium SES and those with a low SES. This shows in a rather clear matter that the socio-economical status becomes important only after reaching a certain level of wealth and education and that the Romanian middle class is not very different in its sense of coherence as the lower class. Indeed, the reality in Romania, a former communist country, is that the middle class is a rather fluctuant group and is still undergoing forceful outside influences. Even those declaring themselves in their answers as being "middle class" are, if compared with other countries, rather under this status. A certain sense of control of life, of its manageability and meaning, is acquired only after gaining strong and consistent control over the material aspects of every day existence.

Another significant relation is the one with the subjective state of health. In many researches evaluating SOC, a strong sense of coherence has been associated with better self reported health. [27, 31-36]

No statistically consistent correlation were found with the BMI, with the weight variation span (ΔW) or with the discrepancy between the actual weight and its subjective perception ("weight perception"). Moreover, some of the highest scores of the SOC were noticed in the obese and overweight classes, at different ages (Table 1). This finding is contradicting one of the premises we had, that obesity is, among other, a consequence of the difficulties one has in coping with stress, measured by the SOC score, leading to food overconsumption. Obese men and women with ages of 25-34 and 55-64 have a higher value of the SOC score than other groups with lower weight and overweighed females of 18-24 have the highest value of SOC score among all age and BMI classes (score 71).

The mechanisms involved in body weight regulation in humans include genetic, physiological, and behavioral factors. Stability of body weight requires that energy intake matches energy expenditure and that nutrient balance is achieved. High variations in weight are the mirror of energy imbalance, on rather longer than shorter periods of time. [35] Obesity and overweight are a result of a positive energy balance, due to a multitude of causes, providing different level of contribution to the weight variation and gain. The correlation analysis between the two factors, BMI and SOC, in the sample we worked on shows that the link of SOC (as a marker of stress coping capacity) with BMI is apparently too small to be statistically significant. The implication of the stress coping power seems to have no significant consequences on the body weight.

Regarding the weight variation span, even if it cannot be connected with the sense of coherence, it has a strong positive correlation with the BMI (Pearson's r =.637). Individuals with a high present BMI had, during their life, the highest weight variation, showing difficulties in adjusting the energy intake to the real energetic needs. Other researches have shown that maintenance of stable weight through life is beneficial to different health risk factors, and to the prevention of morbidity, and death. [38]

There are, though, items concerning the health/weight attitude linked with SOC (table 2). The highest correlation coefficient is with the perceived difficulty in maintaining a constant weight through time.

In the regression analysis, some of the independent variables have changed their link with SOC, compared with what we found in the correlation analysis, either becoming significant, or loosing the significance. Gender becomes statistically insignificant. This shows that among the demographical determinants of the sense of coherence gender plays no predictive role, even though non-causal links may be found. An unexpected finding is the importance of BMI, which becomes a statistically significant determinant of SOC. Indeed, as it could already be seen in table 1, some of the higher SOC scores were found at higher BMI. The other significant determinants are the same as in the correlation tests: the high SES, the perceived state of health, the perceived difficulty in maintaining a constant weight, the perception of the health-normal weight relation and the preoccupation of heaving a healthy diet. Though this model can explain only 16,9 %(R square=.169) of the SOC score, it brings to light some aspects that deserve to be taken in consideration, when evaluating the sense of coherence of a person. Indeed, individuals with a stronger SOC had in many studies healthier behavior choices, independently of social class and education. If one is aware of the link between health and a normal weight, and of the necessity to have a healthy diet, it shows good premises for being a health preventive oriented person. We confirm here that assuming a healthy diet and being aware of the importance of the nutritional status, as source of health and disease prophylaxis, are conceptions and behaviors that can be included in the frame of coherence, as described by the SOC score.

One expected finding is the negative relationship with the perceived difficulty in staying at a certain, stable weight. Generally, individuals with a high SOC score have a high sense of manageability (a component of the sense of coherence), meaning that they feel like having resources available for meeting the demands that they face. [11,12,39] So it is clear that they are finding easier to stay in control of their weight, as they are for any other existential challenge. In other studies, [20,21,23,30] individuals with a weak SOC showed the potential to engage in less healthy behaviors—for example cigarette smoking, poor dietary habits, drinking alcohol—because they were less able to deal with everyday stress, less able to meet potential or real challenges of life .

The inherent limitations of a cross sectional study give us not the possibility to understand correctly the relation BMI - SOC, because we are not allowed to see in the perspective of time the succession of changes. A rise of SOC score is determined by the rise of BMI, namely a rise with 0.513 Kg/m^2 of the BMI can lead to a unit rise of the BMI score. It is mandatory to follow the dynamics of these changes, both regarding BMI, and SOC, throughout a longitudinal study. However, previous studies regarding the stability of SOC confirmed that it can vary through time under the influence of different factors.[25] And presumably getting more weight is one of them.

SOC is a way of seeing the world, which facilitates successful coping with the innumerable, complex stressors that confront individuals in their daily lives.[9,10,37] Antonovsky said that, "SOC is very explicitly not a substantive coping strategy, as mastery orientation or an internal locus of control". [13] Individuals with a strong SOC perceive the world as predictable, manageable and meaningful and view environmental stressors as challenges worth facing. Such a person is very flexible, which enables him/her to find successful solutions to conflicts. The SOC was always correlated with a global orientation to oneself and one's environment, to life stressors, health, illness and wellbeing and with attitudes and behavior. [13] The present study shows the positive link of SOC with healthy beliefs regarding weight and with the importance of eating healthy, and an inverse relation with the perceived difficulty of maintaining the weight constant. It also brings to light a surprising positive determinacy of BMI on SOC, with a little rise of the score, determined by weight gain. Overall, it is clear that the sense of coherence covers also the nutritional status of an individual and his/hers conceptions in this field, aspect that has to be taken in account in further investigations in the health promotion domain.

Key points

- The sense of coherence shows a small but significant link with the body mass index, a small rise of BMI leading to a higher SOC score
- The sense of coherence is linked with healthier conceptions and believes regarding the importance of weight and diet.

Acknowledgements

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Table 1. The SOC score on age-groups and BMI-categories

	Age group(years)													
	18-24		25-34		35-44		45-54		55-64		65-74		≥75	
	f	m	f	m	f	m	f	m	f	m	f	m	f	m
Underweighted	58.8 (10.11)	67 (0)	55 (9.7)	-	51 (0)	-	57 (0)	-	-	-	65 (0)	-	-	-
Normally	58.7 ( )	62 (10.2)	57.4 (10.7)	61 (8.9)	59.6 (10.6)	56.5 (10.3)	57.1 (14)	59.7 (12.5)	59.9 (12.3)	59.5 (12.7)	54 (11.5)	-	64 (14.8)	63 (15.5)
Over	71.5 (0.7)	60.6 (12.7)	62.9 (11.89)	61 (8.9)	59.2 (10)	64.2 (9.4)	57.7 (10.1)	58.6 (9.0)	57.2 (11.3)	59.9 (9.4)	54.7 (16.7)	68 (7.7)	64.5 (2.12)	61 (0)
Obese	53.6 (24.5)	63 (4.2)	64 (7.0)	62.5 (13)	61.3 (12.5)	65.2 (13.3)	54.2 (13.3)	55.1 (10.2)	62.7 (10.5)	64 (5.3)	52.1 (18.1)	65.5 (11.7)	57.5 (17.3)	67 (0)

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Table 2. Correlation coefficients between the SOC score and demographical/nutritional items

Soc 13 SCORE		
Variables	Correlation coefficient	Sig(2-tailed)
Age	-.047	.175
BMI	.014	.971
ΔW	-.042	.162
Weight perception	-.037	.310
SES1-0	-.044	.235
SES 2-0	.174	.000**
Gender	.119	.001**
Perceived present health	.243	.000**
Preoccupation healthy food	.152	.000**
Weight preoccupation	.066	.071
Health- normal weight	.132	.000**
Eat-weight	.011	.766
Perceived difficulty constant weight	-.210	.000**

 **Correlation is significant at the 0.01 level (2-tailed).

Table 3. The significant determinants of the SOC score in a linear regression model

Independent variables	B	SB	β
Gender	1.23	.85	.05
SES 2-0	2.24	.76	.10*
BMI	0.51	.10	.21**
Weight perception	-0.93	.78	-.04
Perceived present health	2.4	.44	.20**
Preoccupation healthy food	1.52	.51	.12*
Weight preoccupation	0.16	.43	.01
Health- normal weight	1.35	.54	.10*
Eat-weight	-0.53	.39	-.05
Perceived difficulty constant weight	-2.3	.37	-.25**

* Correlation is significant at the 0.05 level (2-tailed).
**Correlation is significant at the 0.01 level (2-tailed).