

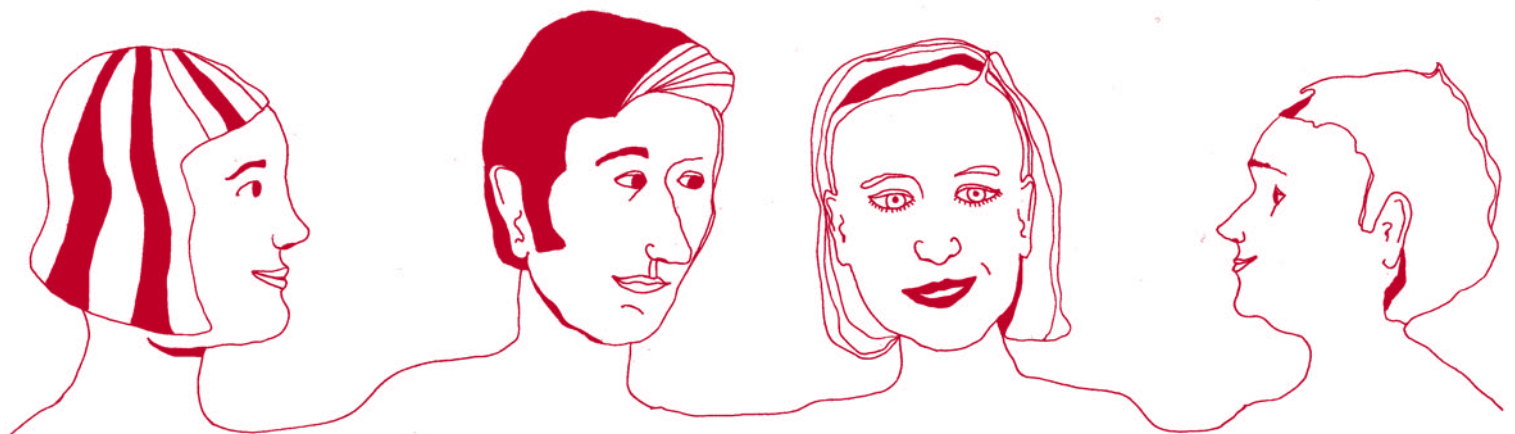
Sense of coherence and awakening
Evidence from the population survey
in Lithuania

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– Essay –

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Abstract

Lithuania has one of the highest suicide rates for men in the world (81.7 per 100,000 men). 21.7% of the population feels depressed.

A salutogenic model of health developed by Antonovsky provides new knowledge for better understanding of the behaviour of individuals and explains why some individuals fall ill under stress and why some do not.

The study is focussed on the analysis of sense of coherence (SOC) on the population sample of Lithuania (n=3390) using a simplified way of measuring SOC developed by Lundberg and Nyström Peck at the Swedish Institute for Social Research of Stockholm University.

The data of the study showed that people with low SOC (60.1%) predominate among the Lithuanian population. A strong correlation between low SOC, depression and stress was found.

Additional studies, preferably longitudinal, are needed to identify possible relationships between cognitive processes (SOC) and biological mechanisms, causing adverse effects on mental health.

Key words

Sense of coherence (SOC), mental health, population survey

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Introduction

Health Status of the Population in Lithuania

In recent years Lithuania has experienced numerous economic, political and social changes having a negative influence on the health status of the population. For the first time in the country's history the natural population increase is negative in peacetime (1). The rate of deaths from cardiovascular diseases is twice as high as in the European Union (Table 1).

Table 1. The main health status indicators in Lithuania (LT) and the average in the European Union (EU) and in European (E) countries (Sources: WHO database, 2002; Health Statistics of Lithuania, 2002).

Main health status indicators	LT	EU	E
Birth rate (per 1,000 population)	8.9	10.7	10.8
Mortality rate (per 1,000 population)	11.9	9.7	11.1
Infant mortality rate (per 1,000 live births)	6.8	4.7	9.7
Life expectancy at birth in years:			
Men	66.5	75.6	69.9
Women	77.9	81.7	78.0
Standardized mortality (per 100,000 population) caused by:			
cardiovascular diseases			
Total	528.8	249.0	469.0
Men	702.5	309.1	594.0
Women	416.4	190.6	380.4
injuries and poisoning			
Total	149.7	39.5	89.8
Men	259.8	57.6	149.2
Women	55.9	22.7	39.9
suicide			
Total	44.0	10.2	18.0
Men	81.7	16.0	31.5
Women	11.5	5.1	6.4
Incidence of tuberculosis (per 100,000 population)	65.1	10.8	42.4
Incidence of AIDS (per 100,000 population)	0.23	2.4	1.4

Such important public health indicators as life expectancy and suicide level among men are especially threatening. The average life expectancy for women is 77.9 years and is close to the European average (78 years). The same indicator for men is 66.5 years while in the EU – 75.6 years (Table 1). Lithuania has one of the highest suicide rates in the world (44.0 per 100,000 people, while the European average is 18.0 per 100,000). The suicide rate per 100,000 men is 81.7, and for women – 11.5 (Table 1).

Coronary heart disease mortality among 50-year-old Lithuanian men is four times as high as that of 50-year-old Swedish men (2). The difference cannot be explained by standard risk factors. A possible alternative explanation is psychosocial strain and oxidative stress (2).

The data obtained from the National Survey (3) revealed that 5.9% of the adult Lithuanian population (n=3362) evaluate their health status as very good, 29.2% as reasonably good, 37.0% as medium, 20.2% as not very good and 7.7% as very bad. 21.7% of the population feel depressed; almost one-third of the respondents stated having used sleeping pills (3). Epidemiological studies show that almost 500,000 Lithuanians (15% of the total population) need psychological, psychotherapeutic or psychiatric counselling (4).

Salutogenic Model of Health

A new paradigm for health research, explaining why people stay healthy in spite of extreme circumstances has been developed by Antonovsky (5). Antonovsky introduced the salutogenic model based on two concepts: general resistance resources (GRRs) and sense of coherence (SOC). The general resistance resources are both of external and internal character and help people manage their lives. The ability to use one's GRRs is based on one's sense of coherence (SOC). The perception of coherence is based on cognitive, behavioural and motivational factors. SOC is strongly developed if a person sees the world as comprehensible, manageable and meaningful. According to theoretical prerequisites of Antonovsky (5) SOC is fully developed by the age of 30 and remains rather stable, with only major life events upsetting and altering it.

The term salutogenesis, coined as the antonym of pathogenesis, is meant to emphasise health promotion and disease prevention rather than the pathogenic origins of disease (5). Health in the salutogenic model is conceptualised as a continuum in which health – ease is at the optimal end of the continuum and disease at the unfavorable end. An individual's position and direction of movement along the continuum are determined by the interplay of opposing forces of environmental threat (e.g., stressors), one's resistance (e.g., GRRs), and the strength of one's SOC (6).

In theory, SOC is hypothesised to be a salutogenic resource influencing the aetiology of and recovery from disease through effective coping. This coping may include avoidance of habits that directly interfere with health (smoking, excessive drinking, unhealthy diet, sedentariness) and adaptive behaviours that can lessen the severity of illness (transactions with health professionals, seeking early treatment, compliance). In

addition, SOC is thought to decrease the likelihood of perceiving the social environment as stressful. This reduces susceptibility to health-damaging effects of chronic stress by lowering the probability of repeated adverse neurophysiological reactions and negative emotions related to stress perceptions (5).

In empirical studies, SOC has been found to be inversely associated with diseases, disabilities and symptoms including health complaints, dysfunction and distress, physical symptoms and illnesses, burn out, sickness absence frequency, and self-related health (7). In addition, SOC has been linked with various indicators of mental health including, e.g., anxiety, depression, subjective well-being, happiness and self-esteem (7). A strong negative correlation was found between SOC and depression (8). Takayama et al. (9) discovered that SOC was positively related to psychological health, having a buffering effect on psychological health while dealing with stressful life events.

The state of research to date shows that SOC and mental health are closely related (8,10). These relationships were confirmed on a representative population sample (11,12). The relationship between SOC and measures of physical health or the subjective general state of health proved to be less clear (10).

The empirical foundation of the salutogenic model is limited to cross-sectional studies, which measure the relation between SOC and diverse parameters of psychological and physical health. These correlations do not allow conclusions to be drawn about causal relationships. If significant relationships between high SOC and a health variable are established, it cannot be regarded as proof that SOC is a causal factor, i.e. a prerequisite or a cause for health and health maintenance (10). According to Geyer (8), the extent to which SOC predicts health and the extent to which health affects SOC remain open to debate. Further studies are necessary to clarify this question .

Many authors seem to feel (10) that putting the salutogenic model into practice in the field of prevention is equal to implementing the WHO concept of health promotion. The basic premises of Antonovsky's model for health promotion and prevention imply the need to create an environment which offers children and adolescents enough resources to build strong SOC. SOC does dominate as a personal resource in the model of salutogenesis; however, in order for it to develop, health-promoting and preventive measures must aim at fostering a broad spectrum of individual, social and cultural factors, such as intelligence, education, coping strategies, social support, financial opportunities and cultural stability (10). According to Wolf and Ratner (6), with further comprehension of the concept of SOC, improved health states may be achieved.

New information is needed for better understanding and preventing mental health problems among the Lithuanian population. The study was the first attempt to measure the SOC level of the Lithuanian population and to determine the relationship between SOC and mental health issues. Such data have not been presented in any form before.

Purpose and Objectives

Purpose

The purpose of the study was to determine the relationship between SOC and health in a nation-wide representative sample of the Lithuanian population.

Objectives

1. To measure the distribution of SOC over social classes, age groups and between men and women using the simplified SOC scale.
2. To determine the relationship between low SOC and self-reported health indicators.

Ethical Considerations

This study was a part of the National Survey on health related behaviour of the adult population of Lithuania. Participation in the study and answering the questionnaire was voluntary. The questionnaire informed the participants that their input would contribute to better understanding and management of health behaviour of the population. The study was approved by the Ministry of Health of Lithuania.

Method

The sample of the target population, 4,300 individuals 18-95 years old in 2001, was randomly selected from the register of the Lithuanian population. Quantitative research design using an anonymous questionnaire was applied. The questionnaire for the National Survey was developed and distributed through the local public health network. 3,390 questionnaires were returned; the response rate being 78.8%.

Such variables as age, gender, social class, stressful life events, experienced stress, depression, and self-characterised health status were used (Appendix 1). The respondents were divided into six age groups (from 18 to 65 and older). The CINDI questionnaire was used to assess health status (13). A five-point response scale ranging from one (very good) to five (very bad) was used. Stressful events which greatly changed a respondents' life in the last 12 months were recorded from the reports of the respondents. Social status was based on the occupation and educational level of the respondents.

During the study SOC was measured in a simplified way developed by Lundberg and Nyström Peck at the Swedish Institute for Social Research of Stockholm University (14). The simplified SOC measure is based on the questionnaire having three items – one question for each of the three dimensions: manageability, meaningfulness and comprehensibility.

The following three questions were used:

- Do you usually see a solution to problems and difficulties that other people find hopeless? (A question concerning manageability).
- Do you usually feel that your daily life is a source of personal satisfaction? (A question concerning meaningfulness).
- Do you usually feel that the things that happen to you in your daily life are hard to understand? (A question concerning comprehensibility).

The response alternatives to these questions were:

- 1) Yes, usually; 2) Yes, sometimes; 3) No.

On the basis of these three questions a summed index was compiled where “usually” scored zero, “sometimes” scored one and “no” scored two points. The comprehensibility question was scaled in reverse order. The index ranged from zero points, indicating extremely high SOC, to six points, indicating extremely low SOC. The index, according to the methodology of simplified measurement of SOC elaborated by Lundberg and Nyström Peck (14) was evaluated so that three points or more constituted the category with low SOC.

These three questions from the Lundberg and Nyström Peck questionnaire were translated into the Lithuanian language and tested for reliability by using a test-retest procedure (n=107, men – 25.2%, women – 74.8%, mean – 43 years, SD – 15.9, the time-span between the interview and reinterview varied from 35 to 37 days). Kappa for manageability was found to be 0.64; meaningfulness – 0.64; comprehensibility – 0.49; for the evaluation of one’s own health status – 0.66; for reporting about feeling depressed – 0.72; reporting on occupational and social status – 0.93; reporting on educational level – 0.84.

The data obtained from the questionnaires were analysed using the EPIINFO 6.0 and SPSS 8.0 software. The conventional methods of statistics were used to assess the differences between the sample groups.

The logistic regression model was used to assess the relationships between low SOC and self-reported health indicators. When we are measuring event rates, the correct approach is to use logistic regression models which work in terms of odds, and report effects as odds ratios. Logistic regression analysis was chosen because the dependent variable (low SOC) is dichotomous. It may have only two meanings: either “yes” or “no”. No other meaning exists. Logistic regression is a mathematical modeling method which may be used to describe interrelation among different independent variables (x) and a dichotomous (two-valued) variable. We calculated OR which is an association measure. We purported to identify interrelation among SOC and different variables (different age groups, professions, education, health condition). A reference group was selected within each group, against which respective groups were compared to identify the interrelation (OR and its confidence intervals). Each category of the predictor variable (age, occupation, education, perceived health), except the reference category, was compared to the overall effect.

For practical needs of prevention and taking advantage of the population surveys in Finland and Sweden (7,11) that low SOC predicted significantly more adverse health prospects than high SOC, analysis of the findings of the study was focussed on the adverse health effects of low SOC rather than the health promoting effects of high SOC. Nevertheless, it is not difficult to reverse the results and argue that not having low SOC increases the possibility of being healthy.

Results

Data on background variables

The distribution of the sample between men and women was equal except for the fact that women (23%) prevailed among respondents aged 65 years and more (men accounted for 15%). The mean age of the sample was 46.7 years, SD=18.1 years, minimum – 18 years, maximum – 95 years. The share of men accounted for 43.8%, and the share of women – 56.2%.

24.2% of the respondents were blue-collar workers (lower working class), 21.9% – white-collar workers (civil servants or upper working class), 3.9% – self-employed, 12% – unemployed, 24.6% – pensioners. 12.2% of the respondents had primary school education, 59.7% – secondary school education (including vocational and technical school), 28.1% of the respondents graduated from universities, institutes or colleges.

Most of the respondents perceived their health status as medium (37.0%) and reasonably good (29.2%), 5.9% of the respondents evaluated their health status as very good, 20.2% as not very good and 7.7% as very bad.

Data on Measuring Sense of Coherence

The data on measuring sense of coherence (SOC) in Lithuania are presented in Tables 2-4. According to the methodology of simplified measurement of SOC (14), scores in a summed SOC scale range from zero points, indicating extremely high SOC, to six points, indicating extremely low SOC. During later analysis a summed index according to Lundberg's and Nyström Peck's methodology (14) was divided in such a way that three points or more constituted the category with low SOC, and less than three points indicated a high SOC level.

Table 2. Proportion of the respondents by SOC dimensions on manageability, meaningfulness and comprehensibility.

SOC indicator	Gender	Response alternatives			Total
		Yes, usually	Yes, sometimes	No	
Manageability	Men	22.6 (312)	66.3 (917)	11.1 (154)	43.2 (1383)
	Women	22.4 (408)	66.6 (1213)	11.0 (200)	56.8 (1821)
	Total	22.5 (720)	66.5 (2130)	11.0 (354)	100 (3204)
Meaningfulness		1			
	Men	9.6 (270)	64.3 (885)	16.1 (222)	43.1 (1377)
	Women	19.1 (347)	62.8 (1140)	18.1 (329)	56.9 (1816)
Total	19.3 (617)	63.4 (2025)	17.3 (551)	100 (3193)	
Comprehensibility		3			
	Men	12.0 (158)	57.1 (751)	0.9 (407)	43.0 (1316)
	Women	12.8 (223)	60.4 (1054)	26.8 (468)	57.0 (1745)
Total	12.4 (381)	59.0 (1805)	28.6 (875)	100 (3061)	

The proportion of the respondents on each level in the summed SOC scale presented in Table 3 demonstrates that the highest SOC (i.e. a zero score on the scale) was found among 3.8% of the respondents (4.3% men and 3.5% women). SOC of the majority of the respondents ranged between two and four points (79.9%).

Table 3. Proportion of the respondents on each level in the summed SOC scale
(N=2942).

Category	Gender	Age						Total
		18-24	25-34	35-44	45-54	55-64	≥65	
0	Men	6.7 (12)	6.3 (15)	3.2 (9)	1.7 (4)	4.2 (7)	4.0 (7)	4.3 (54)
	Women	5.2 (9)	4.6 (13)	3.3 (11)	2.5 (7)	3.4 (8)	3.0 (11)	3.5 (59)
	Total	6.0 (21)	5.4 (28)	3.3 (20)	2.1 (11)	3.8 (15)	3.3 (18)	3.8 (113)
1	Men	15.1 (27)	13.5 (32)	10.7 (30)	8.2 (19)	6.0 (10)	8.6 (15)	10.5 (133)
	Women	9.9 (17)	16.3 (46)	9.3 (31)	13.0 (37)	6.4 (15)	7.9 (29)	10.5 (175)
	Total	12.5 (44)	15.0 (78)	10.0 (61)	10.8 (56)	6.3 (25)	8.1 (44)	10.5 (308)
2	Men	24.6 (44)	32.9 (78)	26.4 (74)	28.3 (66)	24.1 (40)	19.0 (33)	26.4 (335)
	Women	29.7 (51)	26.2 (74)	29.7 (99)	21.1 (60)	26.5 (62)	19.3 (71)	24.9 (417)
	Total	27.1 (95)	29.3 (152)	28.2 (173)	24.3 (126)	25.5 (102)	19.2 (104)	25.6 (752)
3	Men	36.3 (65)	32.1 (76)	42.1 (118)	39.9 (93)	41.1 (68)	42.5 (74)	38.9 (494)
	Women	34.3 (59)	41.1 (116)	39.0 (130)	42.1 (120)	42.3 (99)	37.6 (138)	39.6 (662)
	Total	35.3 (124)	37.0 (192)	40.5 (248)	41.1 (213)	41.8 (167)	39.2 (212)	39.3 (1156)
4	Men	10.1 (18)	11.0 (26)	14.6 (41)	16.3 (38)	18.7 (31)	20.7 (36)	15.0 (190)
	Women	15.1 (26)	10.3 (29)	15.0 (50)	15.1 (43)	15.4 (36)	18.5 (68)	15.1 (252)
	Total	12.5 (44)	10.6 (55)	14.8 (91)	15.6 (81)	16.8 (67)	19.2 (104)	15.0 (442)
5	Men	6.1 (11)	3.4 (8)	2.1 (5)	3.9 (9)	4.8 (8)	3.4 (6)	3.7 (47)
	Women	5.2 (9)	0.7 (2)	2.4 (8)	3.9 (11)	4.3 (10)	7.9 (29)	4.1 (69)
	Total	5.7 (20)	1.9 (10)	2.1 (13)	3.9 (20)	4.5 (18)	6.5 (35)	3.9 (116)
6	Men	1.1 (2)	0.8 (2)	1.3 (3)	1.7 (4)	1.2 (2)	1.7 (3)	1.3 (16)
	Women	0.6 (1)	0.7 (2)	1.2 (4)	2.5 (7)	1.7 (4)	5.7 (21)	2.3 (39)
	Total	0.9 (3)	0.8 (4)	1.1 (7)	2.1 (11)	1.5 (6)	4.4 (24)	1.9 (55)

The data of the study showed that 39.9% of the respondents were in the category with high SOC and people with low SOC (60.1%) predominated among the Lithuanian population (Table 4). There were no significant gender differences ($p=0.2226$) among men and women (58.9% of men and 61.1% of women had a low SOC level).

Table 4. Proportion of the respondents with high and low SOC levels by gender and age (three points or more constitute the category with low SOC).

SOC level	Gender	Age						Total
		18-24	25-34	35-44	45-54	55-64	≥ 65	
High SOC	Men	46.4 (83)	52.7 (125)	40.4 (113)	38.2 (89)	34.3 (57)	31.6 (55)	41.1 (522)
	Women	44.8 (77)	47.2 (133)	42.3 (141)	36.5 (104)	36.3 (85)	30.2 (111)	38.9 (651)
	Total	45.6 (160)	49.7 (258)	41.4 (254)	37.3 (193)	35.5 (142)	30.7 (166)	39.9 (1173)
Low SOC	Men	53.6 (96)	47.3 (112)	59.6 (167)	61.8 (144)	65.7 (109)	68.4 (119)	58.9 (747)
	Women	55.2 (95)	52.8 (149)	57.7 (192)	34.9 (181)	63.7 (149)	69.8 (256)	61.1 (1022)
	Total	54.4 (191)	50.3 (261)	58.6 (359)	62.7 (325)	64.5 (258)	69.3 (375)	60.1 (1769)

The logistic regression model was used to assess the relationships between low SOC and self-reported health indicators.

The results of logistic regression (Table 5) demonstrate that age, socio-economic status (based on occupation and education), perceived health status and experienced stress or depression increased the risk of having a low SOC level. The elderly, respondents of lower social groups (blue-collar workers, unemployed, less educated individuals) had significantly higher risk of having low SOC. A strong correlation between low SOC and perceived health status, including such mental health issues as depression and stress, was found. A significantly higher risk of having low SOC was characteristic of the respondents having a poor health status, more often feeling depressed and stressed.

Table 5. Determinants of low sense of coherence (n=2531) (respondents who reported stressful life events that greatly changed their life were excluded).

Predictor	OR	95% CI	p-value
Age			0.0000
18-24	Refer.		
25-34	0.68	0.56; 0.82	
35-44	0.95	0.79; 1.15	
45-54	1.09	0.89; 1.34	
55-64	1.28	1.01; 1.61	
≥ 65	1.45	1.18; 1.78	
Occupation			0.0000
Self-employed	Refer.		
White collar worker	0.69	0.54; 0.89	
Blue collar worker	1.28	1.00; 1.63	
Unemployed	1.93	1.44; 2.60	
Education			0.0000
University	Refer.		
College	0.66	0.53; 0.84	
Secondary	1.12	0.90; 1.38	
Primary school	1.79	1.37; 2.34	
Perceived health			0.0000
Very good	Refer.		
Reasonably good	0.69	0.58; 0.82	
Medium	1.19	1.00; 1.42	
Not very good	1.56	1.26; 1.92	
Very bad	2.37	1.67; 3.36	
Feeling depressed			0.0000
No depressed	Refer.		
No often	0.84	0.73; 0.98	
Often	1.53	1.18; 1.84	
More often	1.55	1.17; 2.05	
Experienced stress			0.0000
No	Refer.		
A little	0.91	0.78; 1.06	
More than others	1.47	1.19; 1.81	
Very often	1.56	1.11; 2.19	

Discussion

This study was focussed on two issues: to measure SOC on the population sample using a simplified SOC scale and to determine relationships between low SOC and self-reported health indicators.

Methodological issues

The original measuring instrument “Orientation to Life Questionnaire” (OLQ) elaborated by Antonovsky constitutes 29 items which each had a corresponding seven-point assessment scale (5,15). The 29-item SOC-scale is too long and difficult to use for the multipurpose National Survey; therefore, the simplified SOC scale developed by Lundberg and Nyström Peck (14) was chosen. Since we have used another instrument than that originally developed by Antonovsky (5) we may of course be measuring a phenomenon that is similar but not identical to Antonovsky’s concept (11). The reliability of three items of the simplified SOC scale according to Lundberg and Nyström Peck (11,14) seems to be satisfactory (weighted Kappa for manageability found to be 0.49; meaningfulness – 0.55; comprehensibility – 0.61). The simplified measure of SOC seems valid in the sense that three items used from a single factor, which is then likely to be SOC, relates to health and gender in a way that should be expected from studies based on the original scale (11,14). These three questions from the Lundberg and Nyström Peck questionnaire were translated into the Lithuanian language and tested for reliability. Kappa for the manageability and meaningfulness was found to be 0.64 and might be interpreted as good agreement, for comprehensibility – 0.49, and might be interpreted as moderate agreement (16).

Discussion of the study results

The results of the study showed that age, type of occupation and degree of education significantly influenced the differences of SOC levels, but gender did not. Independence of the SOC value from gender supports Antonovsky’s assumption and results of other population studies (11,17-19). Contrary to Antonovsky’s assumption our study revealed SOC differences in relation to age. Older people had significantly lower SOC and these findings were consistent with the previous Lundberg and Nyström Peck study of the Swedish population sample (14) and Harri’s study of Finish nurse educators (20). In contrast to our findings some other studies indicated that the strength of SOC increases with age (12,18). Our findings are in accordance with the large body of previous studies that confirmed the relationship between SOC and social class (11,17,18,21). SOC had a salutogenic effect among white-collar workers in studies of Poppius et al. on Finnish middle-aged working men of different occupations (22).

Results of simplified measurement of SOC demonstrate that more than a half of the respondents (60.1%) in Lithuania have a low SOC index while, for instance, in Sweden only 19.0% (14). A correlation was found between low SOC and health status, which

was perceived as bad. This finding was also confirmed in other population studies in Denmark, Finland and Sweden (18,23,24). On the contrary, a high level of SOC correlated with health perceived as good (21,25). The research shows a less clear relationship between SOC and perceived general health status than between SOC and mental health issues (12,19,25). The above-mentioned Lundberg and Nyström Peck study (11) made the conclusion that the relationship between SOC and physical illness could be understood in terms of the complaints made by the patient. Respondents with low SOC values might tend to complain more than those with higher SOC values.

This study, as many previous researches on SOC, found relationships between SOC and mental health issues such as depression and stress. Respondents who were depressed and stressed more often had a significantly higher risk of having low SOC. The correlation was confirmed in other representative population samples in Sweden (11,12), Finland (21), and Canada (6). For instance, data from the population survey in Sweden (11) show that the risk of having psychological problems for persons with low SOC was more than three times higher than for persons with high SOC. This relationship is independent of the variables of age and gender. Various other studies show high correlation coefficients between SOC and anxiety, SOC and appraisal of a situation as stressful, as well as SOC and depression (8,10,25) and SOC and suicidal ideation (26,27). The high correlation between SOC and stress and SOC and depression are striking and raises the question as to whether SOC can be characterised as a new dimension of mental health, or whether the known constructs as well as tried and true instruments can be obtained. However, this question cannot be answered completely on the basis of the current state of research (10).

The study results relate to those reports of differences in mental health of men and women in Lithuania expressed as suicide rates, and with findings that low SOC may initiate a suicidal ideation (26). There has been some debate as to whether SOC, as a general resistance resource (GRR), has a direct effect on health or acts as a buffer variable that moderates the relationship between stress and health. Some researches have found that SOC acts as a GRR with a direct effect on health. Other researches have found that SOC acts as a buffer variable, moderating the influence of stress on the development of illness (25). Antonovsky hypothesised that the strength of SOC has direct physiological consequences and affects health status through the central pathways of the neuroimmunological and endocrine systems (5). Other studies are needed in order to identify a possible relation between cognitive processes (SOC) and biological mechanisms causing adverse mental health effects.

The basic premises of Antonovsky's model for health promotion and prevention imply the need to create an environment which offers children and adolescents enough resources to build strong SOC because health promoting interventions in adulthood require more intensive measures to achieve a change due to the stability of SOC in adulthood (10).

The possibilities of using the findings of the latter study in preventive work among the general population and especially among young men will depend on further public health development in Lithuania and the challenges it will meet. Nevertheless, the

promotion of mental health of young men in such arenas as the educational system or the armed forces should include measures enhancing and developing the individual's ability to perceive and comprehend each situation he finds himself in, to adapt or to change the situation in question and to develop a repertoire of flexible responses and behaviours, instead of repeating maladaptive patterns. We should also remember that high SOC does not necessarily create better people, but it creates people who are more capable of dealing with difficult life conditions. People with high sense of coherence do not necessarily have any interest in concepts like humanity, empathy or solidarity. It is much more important to create societies and living conditions where we do not need people with high sense of coherence (28). The salutogenic approach should be taken considering the development of healthy public policy and designing the National Strategic Action Plan.

Conclusions

1. Data of the study showed that among the Lithuanian population people with low sense of coherence (SOC) predominate: 39.9% of the respondents had high SOC and 60.1% were in the category with low SOC.
2. The study findings were consistent and partly differed from the previous studies of SOC measurement of the population sample. Age, type of occupation, level of education, perceived health status including mental health issues, significantly affected differences of SOC levels. There were no significant gender differences.
3. Correlation between low SOC and depression and between low SOC and stress was found.
4. To identify possible relationships between cognitive processes (SOC) and biological mechanisms causing adverse mental health effects, additional studies – preferably longitudinal – are required.
5. There is a need to create an environment which offers children and adolescents enough resources to build strong SOC, because health promotion interventions in adulthood require more intensive measures to achieve a change due to the stability of SOC in adulthood.

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Questionnaire

1. Your gender:

Men..... 1
Women.... 2

2. Your age: years

3. Education (educational institution graduated):

Primary school..... 1
Secondary school..... 2
College (higher school)..... 3
University (high school)..... 4
Other (please indicate) 5

4. Occupation:

Self-employed (entrepreneur)..... 1
White collar (civil servant, office) worker..... 2
Blue collar (industrial) worker..... 3
Unemployed..... 4
Other (please indicate)..... 5

5. Do you usually see solutions to problems and difficulties that other people find hopeless?

Yes, usually..... 1
Yes, sometimes..... 2
No..... 3

6. Do you usually feel that your daily life is a source of personal satisfaction?

Yes, usually..... 1
Yes, sometimes..... 2
No..... 3

7. Do you usually feel that the things happen to you in your daily life are hard to understand?

Yes, usually..... 1
Yes, sometimes..... 2
No..... 3

8. Have you experienced radical changes and stressful life events which greatly changed your life during the last 12 months?
 (e.g. moving to a new community, changes in marital status or employment, the birth of a child, funeral or disease of close relative, winning a lot of money in lottery, and etc.)
- Yes, describe the event..... 1
 No..... 2
9. Did you feel depressed (very bad mood) during the last 12 months?
- Never felt depressed..... 1
 No often..... 2
 Often..... 3
 More often..... 4
10. Did you experience any stress or tension during the last 12 months?
- Very often 1
 More than others 2
 A little 3
 No 4
11. What do you think your present state of health is? Is it:
- Very good..... 1
 Reasonably good..... 2
 Medium..... 3
 Not very good..... 4
 Very bad..... 5

Article

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Sense of coherence and awakening pattern. Evidence from the population survey in Lithuania

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Summary

A salutogenic model of health developed by Antonovsky and findings of the Psychophysiology and Stress Research Group of University of Westminster provide new knowledge for better understanding of physiological consequences and their effects on individual's behaviour and explain why some individuals fall ill under stress and why some do not.

The study was focussed on determining relationship between sense of coherence (SOC) and awakening pattern as stable behaviour pattern using a simplified way of measuring SOC developed by Lundberg and Nyström Peck at the Swedish Institute for

Social Research of Stockholm University. 3390 persons aged 18-95 participated in the National Survey. Data of the study showed that among Lithuanian population predominate people with low SOC: 39,9% of the respondents had high SOC and 60,1% made the category with low SOC. Significant relationship of having a low SOC for early risers men workers, educated at vocational schools and perceived health status as very bad was found.

The hypothesis that early wakers have lower SOC compared to those who wake up late was right for men but did not for women.

Findings of the study may be considered as one of possible explanations of differences in mental health of men and women in Lithuania and provides new information for better understanding and preventing mental health problems of the Lithuanian population.

Key words: sense of coherence (SOC), awakening, mental health, population survey.

Introduction

New information is needed for better understanding and preventing possible causal factors of mental health problems in the Lithuanian population [1-3].

Antonovsky's concept of sense of coherence (SOC) has been introduced as a protective personality factor [4]. A strong relationship was found between SOC and mental health problems [5-15].

Psychophysiology and Stress Research Group of University of Westminster determined the difference between the physiology of normal people who tend to wake up early and those who wake up late [16]. It was found that early awakening is associated with higher levels of cortisol, the main stress hormone of the body. The study

showed that such single and stable behavioural characteristic as awakening is related to trait cortisol levels throughout the entire day, not just at the time of awakening. These differences may be important in other aspects of physical and mental well being, and as a SOC of Antonovsky could help answering the question why some individuals fall ill under stress and why some do not.

The purpose of the study was to verify the hypothesis that early wakers have lower SOC compared to those who wake up late using a simplified way of measuring SOC of the Lithuanian population.

Objectives and methods of the study

The study had the intention for the first time to measure the sense of coherence (SOC) on the population level in Lithuania and to determine relationship between SOC and awakening as behaviour pattern in correlation with sex, age, social status, and health.

3390 persons aged 18-95 randomly selected from the register of the Lithuanian population participated in the National Survey (the response rate being 78,8%). The distribution of the sample between males and females was equal except for the fact that females (23%) prevailed among the respondents of 65 years and more (males accounted for 15%). The mean age of the sample was 46,7 years, SD=18,1 years, minimum – 18 years, maximum – 95 years. The males accounted for 43,8%, the females – 56,2%. Such variables as age, sex, perceived health status, stressful life events, a social class and awakening pattern were used. The respondents themselves evaluated the awakening pattern as stable behavioural characteristic (biological clock).

The 29-item scale elaborated by Antonovsky is too long for the multipurpose National Survey, therefore the simplified SOC indicator developed by Lundberg and Nyström Peck [17] at the Swedish Institute for Social Research of Stockholm University was used. The simplified SOC measure is based on the Questionnaire having 3 items – one question for each of the 3 dimensions: manageability, meaningfulness and comprehensibility. The index ranged from 0 points, indicating an extremely high SOC, to 6 points, indicating extremely low SOC. The index was evaluated so that 3 points or more constituted the category with low SOC. The simplified SOC indicator according to Lundberg and Nyström Peck is reasonably valid in relation to the theoretical propositions given by Antonovsky and highly valid in an expected way [17]. These 3 questions from the Lundberg and Nyström Peck questionnaire were translated into the Lithuanian language and tested for reliability (n=107, males – 25,2%, females – 74,8%, mean – 43 years, SD – 15,9). The Kappa indicator showed that the questionnaire was reliable (Kappa>0,4): for the manageability – 0,64; meaningfulness – 0,64; comprehensibility – 0,49, for the awakening pattern – 0,78.

The data obtained from the questionnaires were analysed using the EPIINFO 6.0 and SPSS 11.0 software. The conventional methods of statistics were used to assess the differences between the sample groups. The univariate analysis and logistic regression were used to assess the relationships.

Results

47,9% of the respondents assessed themselves as early wakers and 52,1% as late wakers. A correlation between the awakening pattern and age was found (Table 1). There was a significant difference by the awakening pattern between younger

respondents and elderly. One third of the 18 – 34 years old respondents reported themselves as early wakers according to the awakening pattern while among elders (55 years and more) about 2/3 of respondents stated being early wakers. The distribution of the middle aged respondents (35 – 54 years old) according the awakening pattern was almost equal.

Table 1. Percentage of self-characterised awakening pattern by sex and age.

Awakening pattern	Gender	Age			Total
		18 - 34	35 - 54	≥ 55	
Early wakers	Men	17,6 (95)	39,8 (215)	42,6 (230)	46,8 (540)
	Women	16,5 (121)	34,2 (251)	49,3 (361)	48,7 (733)
	Total	17,0 (216)	36,6 (466)	46,4 (591)	47,9 (1273)
Late wakers	Men	45,5 (279)	39,6 (243)	14,9 (91)	53,2 (613)
	Women	36,9 (285)	38,9 (300)	24,2 (187)	51,3 (772)
	Total	40,7 (564)	39,2 (543)	20,1 (278)	52,1 (1385)

For practical needs of prevention and taking advantage of the population survey in Sweden [17] and Finland [18] and the fact that low SOC predicted significantly more adverse health prospects than high SOC the study was focussed on the adverse health effects of a low SOC rather than the health promoting effects of a high SOC. The data of the study showed that people with low SOC predominated among the Lithuanian population: 39,9% of the respondents had high SOC and 60,1% made the category with low SOC. A comparison of data from simplified measurements of SOC in Sweden [17] and Lithuania are presented in Table 2.

Table 2. Proportion of cases on each level in summed SOC scale in Sweden and Lithuania.

SOC category	Percentage		Number of observations	
	Sweden	Lithuania	Sweden n=4266	Lithuania n=3061
0 (very strong SOC)	21,1	3,8	899	113
1	32,6	10,5	1391	308
2	27,3	25,6	1165	752
3 (low SOC)	13,7	39,3	583	1156
4	4,3	15,0	184	442
5	0,9	3,9	39	116
6 (the lowest SOC)	0,1	1,9	5	55

Differences in SOC levels among early and late risers are presented in Tables 3-6.

Early wakers had significantly higher risk of having low SOC than late risers (Table 3).

Table 3. Distribution of SOC by levels among early and late risers (in %)

SOC level	Awakening pattern		p
	Early wakers	Late wakers	
High SOC	44,2 (545)	55,8 (689)	0,000759
Low SOC	50,7 (775)	49,3 (753)	

A statistically significant association between SOC level and awakening pattern was found for men, but not for women (Table 4).

Table 4. Determinants of low sense of coherence. Awakening as predictor variable.

Predictor variable	OR	95% CI	p	Men			Women		
				OR	95% CI	p	OR	95% CI	p
Early awakening	1,17	1,06; 1,29	0,0011	1,28	1,11; 1,98	0,0004	1,06	0,93; 1,22	0,3447
Late awakening	0,72	0,59; 0,88	0,0011	0,77	0,67; 0,89	0,0004	0,93	0,81; 1,07	0,3447

In order to control possible confounding (age, health status are linked with awakening pattern) logistic regression procedure was used to identify relationship of SOC level to awakening pattern in association with gender, age, occupation and perceived health status (Tables 5, 6). The respondents who reported about stressful life events were excluded (according to the theoretical prerequisites of Antonovsky's the SOC is fairly stable and only major life events can upset and alter it).

Regression analysis of determinants confirmed the difference in having low SOC for early and late riser's men, but did not for early and late risers women. Significant correlation between early riser's men having low SOC and occupation (workers), education (vocational schools) and perceived health status as very bad was found. A significant higher risk of having low SOC was found for late riser's men with education of uncompleted secondary school, late riser's elderly women, late riser's women with primary school education and late riser's women perceiving health status as very bad. A significantly lower risk of having low SOC was found for late risers men employed as civil servants.

Table 5. Determinants of low sense of coherence in association with awakening (Men).

Predictor variable	Early awakening			Late awakening		
	OR	95% CI	p-value	OR	95% CI	p-value
Age			0,7540			0,4279
18-24	Refer.					
25-34	0,71	0,41; 1,22		0,69	0,47; 1,01	
35-44	0,86	0,55; 1,33		1,12	0,76; 1,64	
45-54	1,07	0,66; 1,75		0,96	0,60; 1,54	
55-64	0,96	0,59; 1,55		1,32	0,67; 2,57	
≥ 65	1,16	0,74; 1,81		1,21	0,63; 2,32	
Occupation			0,0479			0,0032
Businessman	Refer.					
Civil servant	0,55	0,25; 1,19		0,42	0,19; 0,93	
Homeworker	1,22	0,78; 1,89		0,68	0,37; 1,22	
Worker	1,94	1,04; 3,61		1,87	0,41; 8,48	
Farmer	0,94	0,58; 1,51		0,95	0,54; 1,65	
Housewife	1,10	0,66; 1,84		0,52	0,18; 1,46	
Unemployed	1,44	0,76; 2,74		1,87	0,23; 15,04	
Education			0,0479			0,0001
University	Refer.					
Higher school	0,55	0,25; 1,19		1,10	0,64; 1,90	
Techn. school	1,22	0,78; 1,89		0,90	0,58; 1,42	
Vocat. school	1,94	1,04; 3,61		0,81	0,52; 1,28	
Secondary	0,94	0,58; 1,51		0,66	0,41; 1,06	
Not comp. sec.	1,10	0,66; 1,84		1,91	1,12; 3,22	
Primary school	1,44	0,76; 2,74		2,66	1,00; 7,06	
Perceived health			0,0009			0,0000
Very good	Refer.					
Reason. good	0,90	0,57; 1,41		0,84	0,56; 1,25	
Medium	1,07	0,70; 1,65		1,26	0,83; 1,92	
Not very good	1,30	0,78; 2,14		1,36	0,74; 2,49	
Very bad	3,39	1,24; 9,30		2,37	0,80; 6,98	

Table 6. Determinants of low sense of coherence in association with awakening (Women).

Predictor variable	Early awakening			Late awakening		
	OR	95% CI	p-value	OR	95% CI	p-value
Age			0,2211			0,0236
18-24	Refer.					
25-34	0,58	0,34; 1,01		0,75	0,51; 1,10	
35-44	1,32	0,84; 2,06		0,72	0,49; 1,07	
45-54	1,35	0,84; 2,18		1,04	0,68; 1,59	
55-64	1,02	0,67; 1,55		1,40	0,77; 2,54	
≥ 65	1,24	0,86; 1,78		1,91	1,13; 3,21	
Occupation			0,0055			0,1184
Businessman	Refer.					
Civil servant	3,43	0,14; 81,62		0,77	0,45; 1,31	
Homerworker	3,00	0,09; 98,37		1,59	0,35; 7,19	
Worker	4,80	0,20; 114,9		1,51	0,83; 2,75	
Farmer	0,004	0; 530322,5		0,53	0,10; 2,58	
Housewife	2,00	0,08; 48,10		1,04	0,50; 2,14	
Unemployed	4,93	0,20; 119,8		1,81	0,84; 3,85	
Education			0,0035			0,0036
University	Refer.					
Higher school	0,50	0,30; 0,82		0,66	0,44; 1,01	
Techn. school	0,88	0,56; 1,37		0,93	0,60; 1,43	
Vocat. school	2,80	1,20; 6,51		1,08	0,63; 1,84	
Secondary	1,05	0,65; 1,69		1,45	0,89; 2,34	
Not comp. sec.	0,87	0,54; 1,41		1,03	0,55; 1,90	
Primary school	1,54	0,98; 2,43		2,01	1,06; 3,78	
Perceived health			0,0305			0,0000
Very good	Refer.					
Reason. good	0,64	0,41; 0,98		0,49	0,33; 0,74	
Medium	1,33	0,92; 1,92		0,99	0,65; 1,49	
Not very good	1,47	0,97; 2,21		1,51	0,91; 2,48	
Very bad	1,18	0,69; 2,02		4,23	1,58; 11,36	

Discussion

Results of simplified measurement of SOC demonstrate that more than a half of the respondents (60,1%) in Lithuania have low SOC index while Swedish only 19,0% [17].

The obtained data demonstrate a correlation between the SOC level and awakening pattern and prove the hypothesis that late risers have a significantly higher SOC score than early risers. The gender difference was found. The hypothesis was valid for men but was not for women.

One limitation of this study is the reliance on awakening pattern self-reports. There is a possibility that some of the respondents did not know their behaviour pattern and were likely to underestimate.

Our results comply with those reports of differences in mental health of men and women in Lithuania expressed as suicide rates and with findings that low SOC may initiate a suicidal ideation (1,14).

Antonovsky hypothesised that the strength of the SOC has direct physiological consequences and affects health status through the central pathways of the neuroimmunological and endocrine systems [4]. Findings of the study may be considered as one of possible explanations for mental health problems of the Lithuanian population. The study supports a potential relation between cognitive processes (SOC) and biological mechanisms causing adverse mental health effects. Other studies are needed to identify possible mechanisms of such relation.

The possibilities to use the findings of the study in preventive work among general population and especially among young male will depend on the further public health development in Lithuania and the challenges it will meet. Nevertheless the

promotion of mental health of young males in such arenas as the educational system or the armed forces should include measures to enhance and develop the individual's ability to perceive and comprehend each situation he finds himself, to adopt to it and to develop a repertoire of flexible responses and behaviours instead of repeating maladaptive patterns.

Conclusions

1. Data of the study showed that among Lithuanian population predominate people with low sense of coherence (SOC): 39,9% of the respondents had high SOC and 60,1% made the category with low SOC.
2. A strong correlation between low SOC, depression and stress was found. The hypothesis that early wakers have lower SOC compared to those who wake up late was right for men but did not for women.
3. The study findings make one of possible explanations of differences in mental health of men and women of the Lithuanian population and support a potential relation between cognitive processes (SOC) and biological mechanisms (awakening) causing adverse mental health effects.
4. The study provides new information for better understanding and preventing mental health problems of the Lithuanian population, especially promotion of mental health of young males in such arenas as the educational system.

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