FACTORS DETERMINING CHANGES IN SELF-RATED HEALTH IN THE POLISH COMMUNITY-DWELLING ELDERLY

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SUMMARY

Changes in self-rated health and its determinants have been analyzed in the group of 551 community-dwelling older age citizens of Krakow during the 12-year interval observation.

Multidimensional model showed that changes in self-rated health between the studies have been significantly determined by such variables like age and self-evaluation of health status in the Ist study. Self-rated health was also less markedly decreased in men, who continued professional activity in the Ist study. Among variables analyzed in the IInd study it was age-related functional disability reported by men and reported chronic conditions that deteriorated self-rated health significantly.

Changes in self-rated health between the Ist and the IInd study among women were determined by the same variables as in men (except for the continuation of professional activities in the Ist study). Significantly diminished scores were found in women with higher level of functional activity in the Ist study and greater independence in performing daily activities in the IInd study. Analysis of the summary effect of chronic diseases on self-rated health has shown significantly greater deterioration of self-rated health between the first and the second study related to the number of diseases reported in the Ist study.

Key words: changes in self-rated health, determinants of health, Polish community-dwelling elderly

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INTRODUCTION

Numerous studies show that self-rated health (SRH) is correlated with other health indicators, especially mortality (1–8). This global health status measure principally reflects physical health problems (e.g. limitation in physical functioning and chronic and acute conditions) and to the lesser extent mental health problems (9). Manderbacka (10) concluded that self-evaluation of health status seems to be a summary of relevant information that individuals possess about their health.

There has been a shift over time in approach describing relation between self-rated health and other indicators of health status. Earlier studies were concentrated on somatic determinants of self-rated health and suggested that the following studies should be directed toward psycho-social factors which were known to have an impact on perception of health (11–14). At present SRH is perceived as a complex construct and various physical, mental and social events appear to play an important role in shaping health perception (15–17).

Examining the validity of self-rated health as a measure of health status, a substantial correlation has been found between subjective health status and self-reported chronic conditions and symptoms and thus SRH might be a more accurate indicator of actual physical health than other more objective measures (1, 11, 18, 19). The interrelation between self-rated health and objective health status has been confirmed by a number of investigators, who demonstrated that serious chronic diseases affect self-evaluation of health status without similar effect found for short-term health problems (14, 20–22).

Smith (23) mentioned that studies of self-rated health generally fall into two categories: those that categorize SRH as good or excellent versus poor for purpose of predicting survival and those that consider SRH as a continuum and compare it to a range of predictors.

Self-evaluation of health status can depend on the expectation of the individuals or the tasks imposed on them by the environment (family, co-workers, friends), perception of the occurring symptoms, etc. (7, 12, 24).

Gender-related differences in the perception of health status bring about question whether the same criteria are used by men and women in assessing their health, and whether their reference idea of health is similar (7). Results of studies on the determinants of subjective health assessment are inconsistent and not all of them confirm gender-related differences in self-evaluation of health status (25–27).

As it is established in literature, self-rated health is not only gender-related but also depends on the social and economic position, and it is a significant intervening variable in the relationship between objective health determinants and life satisfaction (20, 28, 29).

Self-rated health as a measure of health has been also criticized for the "subjective approach" and for the relativity of underlying concepts by which people assess their health and attribute it specific rank on a scale. The relationship between "subjective" evaluation and "objective" assessment by professionals and the correlation between these two perspectives has been questioned many times. Discrepancies in the assessment of health status between professionals and older people can be attributed to the

diagnosis based on specific age-related diseases established by professionals, detecting all departures from norms; while for older people a standard is their health status at a given time in their life, and they score their health using this approach (10). Discussion focuses also on the role of the individual determinants of self--evaluation of health, i.e. changes of health (disease symptoms, pain tolerance, and disease-related limitations in performing the activities of daily living).

The majority of studies confirmed that self-rated heath in older adults is more reliable than objective measures based on data from cross-sectional studies (11, 30). Few studies to date have examined changes in SRH over time (21, 31). In the older adults self-evaluated health has been found to be a sensitive and significant predictor of mortality, independent of objective health status and other confounders (1, 4, 13, 20). The results of the conducted studies confirmed two- or even three-fold higher mortality in the old persons who rated their health status as poor, as compared with those who perceived it as very good, equally for men and for women and for younger and older members of elderly samples (1, 13, 18, 32, 33). Still fewer have assessed socio-demographic, psychosocial and behavioral determinants of health (6, 25, 29, 34).

The question remains open regarding the pattern of subjective evaluation of health in various stages of old age, assuming heterogeneity of this particular life period that may be divided into early old age up to 75 years and advanced old age over 75 years. It would be interesting to find explanation and justify highly positive SRH in the advanced old age persons in spite of the high grade functional disability, mental limitations or existing threat to life (25). Bailis (31) has developed two alternative interpretations of self-rated health: as a spontaneous assessment and enduring self-concepts (distinction between these views lies in the construct that each take self-rated health to represent: health status and self-concept).

Aim of the study

Having in mind the value of subjectively evaluated health by the elderly people for the assessment of general quality of life in this age group, the efforts have been made to identify health and social determinants of self-rated health comparing results of two studies, covering various stages of old age and concentrating on the determinants of the changing attitudes performed 12 years apart.

MATERIAL AND METHOD

Presented results relate to the data obtained from 551 community--dwelling older age citizens of Krakow, participants of two survey studies performed in the interval of 12 years.

The questionnaire used in base-line study consists of questions concerning socio-demographic data (gender, age, marital status, family status), education, history of professional activity, early retirement, continuation of professional activity during retirement period, living arrangements, leisure activity, system of values (health, family, work, religion, wealth), and attitudes toward health in the past. The data collected from both studies cover information about self-rated health and specify present acute and chronic conditions. In the Ist study following conditions were analyzed: chronic and acute respiratory diseases, asthma, hypertension, ischemic heart disease, myocardial infarction, other heart diseases, gastric and duodenal ulcer, diabetes and rheumatoid diseases. In the follow up study such conditions as hypertension, cardiovascular diseases, asthma, liver and pancreas diseases, rheumatoid diseases, musculo-skeletal disorders, disorders of nervous system, depression and other psychiatric disorders, independence/or level of dependency in daily living activities according to the Activity of Daily Living (ADL) and Instrumental Activity of Daily Living (IADL) such as: eating, toileting, getting out of bed, dressing, washing, taking shower, bathing, going out, walking to the physician, walking to church, going for a walk, preparing breakfast, dinner or supper were questioned. Leisure time activities (listening to the radio, watching TV, reading newspapers or books) as well as quantity and quality of social interactions were also calculated. Self-rated health in the Ist study was analyzed in relation to: age, education level, level of functional independence and level of mobility, continuation of professional activity, on-going treatment for chronic conditions or number of chronic conditions.

Self-rated health was based on a question "How do you generally evaluate your health status" with five possible answers ranging from very good (score 5) through good (4), fair (3) and bad (2) to very bad (score 1). Two different models describing determinants influencing SRH in the first study and in the second study as well as changes between the Ist and the IInd study have been developed. Model I considered, besides demographical data and information on the activity of respondents (functional, mobility, continuation of professional work), the effect of individual chronic diseases on SRH in the Ist study. Model II did not analyze the role of the individual diseases, but their summary influence measured by the number of chronic diseases, due to which respondents received treatment in each phase of the study.

Level of functional independence was calculated as a summary of scores covering such activities as: shopping (3 scores), light house chores (1 score) and heavy house chores (clearing floor, cleaning windows) (4 scores), preparing meals (2 scores), activity outside household (mobility) (0 score – lack of out household activity in spite of living on the first floor, 4 scores – 2 times mobility in spite of living on 5th floor or higher (lack of elevator in city centre) and walking (1 score when a flat is located on first floor, to 2,5 when a flat is located on the 5th floor or higher). Mobility scale evaluated level of difficulties walking on ground level and climbing stairs: 3 scores – lack of fatigue, 2 scores – mobility on ground level was related with fatigue without need to relax and when climbing stairs need to relax on 2 floor or higher, 1 score – relaxation was needed during walking on ground level and while climbing stairs on every floor. Finally both scores were summarized.

Self-rated health in the IInd study was analyzed in relation to: age, education level, self-rated health in the Ist study, independence in activity of daily living (study II), continuation of professional activity during the Ist study, on-going treatment for chronic conditions during Ist and IInd study or number of chronic conditions (respectively in model I and II) and number of cultural activities. This variable described level of independence in cultural needs and was calculated as a number of ability to follow such activities as reading newspapers or books, listening to the radio or watching TV.

Self-rated health assessed in the Ist and in the IInd study has

Table 1. *Pearson correlation coefficients between self-rated health in study I and II and relation between change in self-rated health and other variables*

	Self-rated health in study I	Self-rated health in study II	Change in self-rated health between study I and II
Self-rated health in study II	0.14*	1	
Change in self-rated health between study I and II	-0.45*	0.83*	1
Age	-0.01	0.03	0.03
Mobility	0.34*	0.14*	-0.07
Activity in study I	0.01	0.09*	0.07
Activity in study II	0.10*	0.47*	0.37*
Change in activity between study I and II	0.09*	0.43*	0.34*
Independence in ADL	0.09*	0.33*	0.25*
Independence in IADL	0.12*	0.43*	0.32*
Number of chronic conditions in study I	-0.38*	-0.25*	-0.01
Number of chronic conditions in study II	-0.05	-0.10*	-0.06
Number of cultural activities	0.11*	0.33*	0.23*

*values statistically significant

been compared. Changes over 12 year in self-rated health have been analyzed in relation to such determinants as: age, education level, SRH in the Ist study, level of functional activity (study I), independence in activity of daily living, continuation of professional activity after retirement, on-going treatment for mentioned above chronic conditions or number of chronic conditions (respectively in model I and II) in the Ist and the IInd study, suffering from psychosocial consequences of chronic conditions, disability associated with ageing and number of activities associated with cultural participation.

Statistical Analysis

Distribution of variables determining SRH and its changes between the studies were not normal, and therefore, non-parametric Wilcoxon test for paired samples and Mann-Whitney tests for independent samples were used in the statistical analyses. To find independent determinants of SRH and its changes, two multidimensional models of linear regression were developed. For the purpose of analysis statistical software package SPSS 10 PL for Windows was used.

RESULTS

The study group consisted of 551 community-dwelling citizens of Cracow, with the prevalence of women (66.8%). In the Ist study mean age of the respondents was 70.1 years and in the IInd study mean age of the respondents was 81.3 years. Over 50% of study participants had secondary school and higher education (56.8%). In the Ist study 25.4% respondents were living alone, compared with 38.1% in the IInd study.

In the Ist study 3.8% of respondents reported very good SRH, 78.4% good and 14.7% fair. Two and a half percent of respondents reported bad self-rated health in Ist study and 0.5% reported very bad SRH. In the IInd study 5.8% of respondents reported very good SRH, 27.6% reported good health and 49.2% fair. 13.6% of respondents reported in Ist study bad self-rated health and 3.8% very bad.

Mean self-rated health in the Ist study (3.82) was higher in comparison with the IInd study (3.18) (statistically significant according to the Wilcoxon test $p<0.05$). The difference was statistically significant for each gender group. In the Ist and IInd study no significant gender-related differences in the mean score of SRH (Ist study: 3.83 for women vs. 3.84 for men) were observed, though it was scored lower by women in the IInd study as compared with men (3.14 vs. 3.26, respectively). Also deterioration of SRH between the studies was deeper among women in comparison with men (-0.68 vs. -0.58, respectively).

Self-rated health in the Ist study was significantly determined by the mobility of respondents, more markedly in women than in men, and by the number of reported chronic diseases, where the correlation was slightly stronger for women than for men (tab. 1–3).

Self-rated health in the IInd study significantly correlated with this measure in the Ist study, where the correlation was stronger for men than for women and with the level of functional activity of the respondents in the IInd study (less markedly with the level of functional activity in the Ist study: statistically significant correlation between these variables was observed only in women). Self-rated health in the IInd study correlated also with changes of activity of respondents between the studies and with the number of chronic diseases, for which the respondents received treatment in the Ist study – correlation between SRH and the number of chronic diseases in the IInd study was significant in men only. Self-rated health in the IInd study was significantly related to functional status measured by ADL and IADL scales, as well as to the level of satisfying cultural needs (tab. 1–3).

The changes in SRH between the studies were determined by the score in the Ist study (elderly who scored higher their health status in the Ist study lowered their score more in the time period between studies) and by the score in the IInd study (the changes in scoring were less marked in persons, who scored higher their health status in the IInd study). This change was also related to the level of functional status in the IInd study and to the change of level of activity between studies – more marked decrease of

Table 2. *Pearson correlation coefficients between self-rated health in study I and II and relation between change in self-rated health and other variables in men*

	Self-rated health in study I	Self-rated health in study II	Change in self-rated health between study I and II
Self-rated health in study II	0.18*	1	
Change in self-rated health between study I and II	-0.48*	0.78*	1
Age	-0.09	0.07	0.01
Mobility	0.28*	0.13	-0.06
Activity in study I	0.10	0.02	-0.04
Activity in study II	-0.01	0.48*	0.44*
Change in activity between study I and II	-0.06	0.43*	0.42*
Independence in ADL	0.12	0.35*	0.31*
Independence in IADL	0.04	0.42*	0.34*
Number of chronic conditions in study I	-0.35*	-0.22*	0.02
Number of chronic conditions in study II	-0.01	-0.18*	-0.16*
Number of cultural activities	0.06	0.36*	0.28*

*values statistically significant

Table 3. *Pearson correlation coefficients between self-rated health in study I and II and relation between change in self-rated health and other variables in women*

	Self-rated health in study I	Self-rated health in study II	Change in self-rated health between study I and II
Self-rated health in study II	0.11*	1	
Change in self-rated health between study I and II	-0.43*	0.85*	1
Age	-0.06	0.01	0.05
Mobility	0.39*	0.14*	-0.08
Activity in study I	-0.05	0.15*	0.16*
Activity in study II	0.16*	0.46*	0.34*
Change in activity between study I and II	0.19*	0.42*	0.29*
Independence in ADL	0.14*	0.32*	0.22*
Independence in IADL	0.16*	0.43*	0.31*
Number of chronic conditions in study I	-0.40*	-0.25*	-0.01
Number of chronic conditions in study II	-0.08	-0.06	-0.14
Number of cultural activities	0.13*	0.31*	0.21*

*values statistically significant

functional activity correlated with deterioration of self-rating health status. Changes in SRH significantly correlated with ability to cope with daily activities measured by the ADL and IADL and with the ability to satisfy cultural needs – in each case diminishing capability was manifested by more pronounced deterioration in scoring SRH (tab. 1–3).

The results show that in both models used for the Ist study, men with secondary or higher education rate their health status better. In the model I SRH was significantly deteriorated in men by the ongoing treatment due to the following chronic diseases: arthritis, myocardial infarction, ischemic heart disease, and other heart diseases. In the model II the number of chronic diseases was an independent predictor of SRH in men, however, also influence of mobility of the respondents reflecting escalation of difficulties with moving was statistically significant (R^2 equal 0,21 for model I and 0,23 for model II, respectively).

Self-rated health among women was determined by the same chronic diseases as in men (model I) and also by the number of chronic diseases (model II). In both models the level of mobility was of statistical significance (R^2 equal 0,24 for model I and 0,23 for model II, respectively).

In the IInd study higher scores of self-rated health estimated by two models in men were determined by the age of respondents (older persons scored their health status slightly higher than younger), higher level of functional activity at the time of the study, and continuation of professional activity in the Ist study. Self-rated health in men in the IInd study was diminished by the age-related deterioration of physical condition of the respondents and by the on-going chronic diseases, while the fact of on-going treatment due to chronic diseases reported in the study (model I) and their number (model II) had no effect on SRH (tab. 4).

In women, SRH (independently of the model) was significantly influenced by the same determinants as in men (except for the continuation of professional activity in the Ist study). Women

Table 4. *Factors determining self-rated health in study II – men – linear regression model*

	Model I			Model II		
R^2	**0.49**			**0.44**		
Factor	**B**	**95% CI**		**B**	**95% CI**	
Age*	0.04	0.02	0.07	**0.04**	**0.02**	**0.07**
Education secondary or higher	0.16	-0.10	0.42	0.16	-0.10	0.41
Self-rated health in study I*	0.15	-0.03	0.34	0.16	-0.02	0.34
Level of activity in study II*	0.10	0.05	0.14	**0.09**	**0.05**	**0.14**
Independence in ADL*	-0.01	-0.09	0.08	-0.01	-0.09	0.08
Continuing professional activity in study I	0.27	0.02	0.52	**0.29**	**0.05**	**0.54**
On-going treatment for ischemic heart disease in study I	-0.01	-0.24	0.23	–	–	–
On-going treatment for rheumatic arthritis in study I	-0.15	-0.36	0.07	–	–	–
Number of chronic conditions in study I*	–	–	–	-0.03	-0.13	0.06
The main problem in everyday life is age-related physical limitation	-0.35	-0.58	-0.13	**-0.36**	**-0.58**	**-0.14**
The main problem in everyday life are diseases respondents suffered from in study II	-0.27	-0.50	-0.05	**-0.24**	**-0.48**	**-0.01**
On-going treatment for mobility disorders in study II	-0.12	-0.34	0.10	–	–	–
Number of chronic conditions in study II*	–	–	–	-0.04	-0.12	0.04
Number of cultural activities*	0.09	-0.03	0.20	0.09	-0.03	0.20

B = regression coefficient with 95% confidence interval; *variables considered in the analysis as continuous. Regression coefficients significantly different from zero are in **bold** print

Table 5. *Factors determining self-rated health in study II – women – linear regression model*

	Model I			Model II		
R^2	**0.46**			**0.36**		
Age*	0.03	0.01	0.05	**0.03**	**0.02**	**0.05**
Education secondary or higher	0.05	-0.11	0.20	0.05	-0.10	0.21
Self-rated health in study I*	-0.13	-0.29	0.04	-0.14	-0.31	0.02
Level of activity in study II*	0.07	0.04	0.10	**0.07**	**0.04**	**0.10**
Independence in ADL*	0.07	0.01	0.14	**0.07**	**0.01**	**0.14**
Continuing professional activity in study I	-0.19	-0.51	0.14	-0.21	-0.53	0.11
On-going treatment for ischemic heart disease in study I	-0.17	-0.33	-0.01	–	–	–
On-going treatment for rheumatic arthritis in study I	-0.11	-0.26	0.05	–	–	–
Number of chronic conditions in study I*	–	–	–	**-0.09**	**-0.15**	**-0.02**
The main problem in everyday life is age-related physical limitation	-0.23	-0.41	-0.06	**-0.26**	**-0.43**	**-0.09**
The main problem in everyday life are diseases respondents suffered from in study II	-0.44	-0.60	-0.28	**-0.42**	**-0.58**	**-0.25**
On-going treatment for mobility disorders in study II	-0.12	-0.28	0.04	–	–	–
Number of chronic conditions in study II*	–	–	–	0.00	-0.05	0.05
Number of cultural activities*	0.00	-0.07	0.08	0.01	-0.06	0.08

B = regression coefficient with 95% confidence interval; *variables considered in the analysis as continuous. Regression coefficients significantly different from zero are in **bold** print

more independent in performing their daily activities measured on the ADL scale rated their health status better. Among variables that deteriorated self-evaluation of health status were also significant: on-going treatment for ischemic heart disease in the Ist study (model I) and the number of chronic diseases (model II). Similarly as in men, neither on-going treatment due to chronic diseases considered in the IInd study (model I), nor their number (model II) had an effect on SRH (tab. 5).

To the variables significantly determining changes in SRH between the studies (according to both models) belong: age – the score was less markedly deteriorated in older men – and self-evaluation of health status in the Ist study – the respondents

Table 6. *Factors determining change in self-rated health between study I and II – men – linear regression model*

	Model I			Model II		
R^2	0.46			0.49		
Factor	**B**	**95% CI**		**B**	**95% CI**	
Age*	**0.03**	**0.01**	**0.06**	**0.03**	**0.01**	**0.06**
Education secondary or higher	0.14	-0.13	0.41	0.20	-0.07	0.46
Self-rated health in study I*	**-0.89**	**-1.09**	**-0.69**	**-0.84**	**-1. 03**	**-0.65**
Level of activity in study I*	-0.03	-0.09	0.03	-0.01	-0.07	0.04
Independence in ADL*	0.07	-0.01	0.15	0.06	-0.03	0.14
Continuing professional activity in study I	**0.32**	**0.06**	**0.59**	**0.32**	**0.07**	**0.58**
On-going treatment for ischemic heart disease in study I	0.03	-0.22	0.28	–	–	–
On-going treatment for diabetes in study I	-0.08	-0.50	0.34	–	–	–
On-going treatment for rheumatic arthritis in study I	-0.18	-0.41	0.06	–	–	–
On-going treatment for cardiac infarction in study I	-0.18	-0.52	0.16	–	–	–
Started treatment for cardiac infarction in study I	**-1. 86**	**-3.32**	**-0.40**	–	–	–
On-going treatment for other heart diseases in study I	-0.11	-0.35	0.14	–	–	–
Started treatment for peptic ulcer disease in study I	-0.11	-0.54	0.32	–	–	–
On-going treatment for peptic ulcer disease in study I	**-0.43**	**-0.83**	**-0.03**	–	–	–
Number of chronic conditions in I study*	–	–	–	-0.03	-0.13	0.07
The main problem in everyday life is age-related physical limitation	**-0.44**	**-0.67**	**-0.21**	**-0.44**	**-0.67**	**-0.22**
The main problem in everyday life are diseases respondents suffered from in study II	**-0.25**	**-0.50**	**-0.01**	**-0.28**	**-0.52**	**-0.04**
On-going treatment for mobility disorders in study II	-0.07	-0.31	0.16	–	–	–
On-going treatment for nervous system diseases study II	-0.09	-0.35	0.17	–	–	–
Number of chronic conditions in study II*	–	–	–	-0.06	-0.14	0.02
Number of cultural activities*	**0.14**	**0.03**	**0.26**	**0.14**	**0.02**	**0.25**

B = regression coefficient with 95% confidence interval; *variables considered in the analysis as continuous. Regression coefficients significantly different from zero are in **bold** print

scoring lower in the Ist study less markedly decreased the scores between studies as compared to those, who scored it higher. Self-rated health was also less markedly decreased in men, who continued professional activity in the Ist study. The variable that significantly increased deterioration in SRH in model I was the on-going treatment for myocardial infarction in the Ist study and for peptic ulcer. Among variables analysed in the IInd study it was age-related functional disability reported by men and age-related diseases that more markedly deteriorated SRH. Another variable that substantially lowered rating of health status in men was incapability to satisfy their cultural needs (tab. 6).

Dynamics of changes between the Ist and the IInd study with regard to SRH among women was determined by the same variables as in men (except for the continuation of professional activities in the Ist study). Less markedly lowered scores were in women with higher level of functional activity in the Ist study (measured by the index of functional activity) and greater independence in performing daily activities in the IInd study (ADL scale). None of the chronic diseases had significant effect on the changes in SRH (model I), however, the analysis of the summary effect of chronic diseases on their health (model II) has shown more marked lowering of the rating between studies related to the number of diseases reported in the Ist study (tab. 7).

DISCUSSION

Several studies have shown that objectively measured health and functional status decline with age whereas self-rated health seems to remain relatively stable, but when asking older people directly about change in their health status over time, high proportion of elderly report worsening of health (19, 31, 35). Our data confirm that self-rated health significantly declined during 12 year period. Statistically significant changes in SRH in 12 year follow-up might be the effect of a length of follow-up period. With regard to other longitudinal studies the time of observation was not as long (1 year observation, 3 years, 5 years observation) as in this Cracow study, where the interval between base-line study, and second study was relatively long. Individual transitions in SRH were highest among those participants who rated their health as very good at base-line study and those with poor SRH at base-line had lower decline in self-evaluation of health at follow-up. Lower changes in SRH in participants with poor self-evaluation of health status at the beginning of the observation supported Leinonen's suggestion that adaptation to worsening health plays very important role in elder's evaluation of their health. Explanation has been based on continuity theory which focuses on the role of adaptation to ageing and decrease in aspiration level (also in different dimensions

Table 7. *Factors determining change in self-rated health between study I and II – women – linear regression model*

	Model I			Model II		
R^2	0.53			0.44		
Factor	**B**	**95% CI**		**B**	**95% CI**	
Age*	**0.03**	**0.01**	**0.04**	**0.03**	**0.01**	**0.05**
Education secondary or higher	0.08	-0.08	0.24	0.09	-0.07	0.24
Self-rated health in study I*	**-1.15**	**-1.33**	**-0.97**	**-1.11**	**-1.28**	**-0.94**
Level of activity in study I*	**0.05**	**0.01**	**0.10**	**0.05**	**0.01**	**0.10**
Independence in ADL*	**0.11**	**0.05**	**0.17**	**0.11**	**0.05**	**0.16**
Continuing professional activity in study I	-0.08	-0.41	0.25	-0.13	-0.45	0.19
On-going treatment for ischemic heart disease in study I	-0.15	-0.32	0.01	–	–	–
On-going treatment for diabetes in study I	-0.24	-0.61	0.12	–	–	–
On-going treatment for rheumatic arthritis in study I	-0.15	-0.31	0.01	–	–	–
On-going treatment for cardiac infarction in study I	-0.04	-0.34	0.26	–	–	–
Started treatment for cardiac infarction in study I	-0.75	-2.33	0.83	–	–	–
On-going treatment for other heart diseases in study I	-0.10	-0.27	0.06	–	–	–
Started treatment for peptic ulcer disease in study I	-0.28	-0.59	0.02	–	–	–
On-going treatment for peptic ulcer disease in study I	-0.04	-0.39	0.32	–	–	–
Number of chronic conditions in study I*	–	–	–	**-0.11**	**-0.17**	**-0.04**
The main problem in everyday life is age-related physical limitation	**-0.34**	**-0.51**	**-0.18**	**-0.38**	**-0.55**	**-0.22**
The main problem in everyday life are diseases respondents suffered from in study II	**-0.47**	**-0.63**	**-0.31**	**-0.47**	**-0.63**	**-0.31**
On-going treatment for mobility disorders in study II	-0.12	-0.29	0.05	–	–	–
On-going treatment for nervous system diseases study II	0.14	-0.05	0.32	–	–	–
Number of chronic conditions in study II*	–	–	–	0.01	-0.04	0.06
Number of cultural activities*	**0.07**	**0.01**	**0.14**	**0.07**	**0.01**	**0.14**

B = regression coefficient with 95% confidence interval; *variables considered in the analysis as continuous. Regression coefficients significantly different from zero are in **bold** print

of health) in advanced age. Leinonen examined determinants of objective health and functioning in relation to the subjective measurements of decline in health over 5 year period: self-rated health (SRH) and also self-assessed changes in health. He assumed that with increasing age, adaptation would occur and a decline in the objective indicators of health and functional performance would not result in decreasing SRH (35).

Bailis et al. (31) compares two interpretations of self-rated health which may be reflected in either a spontaneous assessment of one's health status and related practices or in an aspect of changes with regard to one's enduring self-concept. Presented data also suggest that dynamic of changes in SRH over time is not only a spontaneous assessment of one's health status but like a self-concept, self-rated health may be regulated by efforts to continue one's relatively important health-related goals but also predictors of SRH in base-line study and follow-up remained different. Fylkesnes (20) showed the direct positive effect of educational achievement on self-rated health in both men and women. Gender-related differences in self-rated health have been confirmed in the most of performed studies. Study performed in Estonia found no differences between men and women in their evaluation of health (34), and we arrived to the same conclusions as mentioned in our study as well.

Maderbacka noted that slope differences in self-rated changes in health between men and women did not reach statistical significance (although they come close to significant at 5% level). Manderbacka demonstrated that both men and women tend to base their general health ratings on a number of health dimensions. Among men all illness variables are strong predictors of general self-rating of health (7).

Smith (23) contrary to other studies confirmed the positive association between increasing age and better health. The oldest people have been found to have a relatively favourable perception of their health compared to the younger elderly (10) Similar relation between self-rated health status and age has been confirmed in our study.

Groundy (5) found that the odds of poor or fair health increased with age (although this was not significant for women, for men the odds of poor or fair health were associated with average lifetime social class – higher odds with lower social class; having no qualification (women), having no academic qualification (men) have been found as factors associated with increased probability of fair/poor rated health.

The stability observed in self-rated health over time indicates that older people adapt to the limitations that are found in their objective health and functional capacity with increasing age (35).

Krause (12) showed that the global health item may be interpreted in different ways by different people and use different frame of reference (specific health problems, more general physical functioning or health behaviours). Older people are more likely to experience chronic health problems in comparison with younger age groups, therefore it is not surprising to find out that older people think in terms of health problems when answering the global health item (9).

The interrelation between self-rated health and objective health status has been confirmed by numerous investigators, who demonstrated that serious chronic diseases affect SRH without similar effect found for short-time health problems. The studies in the Norwegian population showed that physical disabilities, i.e. pain in various localizations and disability negatively influenced self-evaluation of health; however the intervening variable in this relationship was the fear of unemployment. Still other studies also carried out in Norway demonstrated that individual perception of skeletal system-related problems is the strongest predictor of SRH (20).

Our results correspond with other studies showing that individual's perception of somatic symptoms and diseases regarding musculo-skeletal system were found to be the best predictor of SRH among aged. (20). Presented data confirmed in men inverse association between SRH and social position, higher level of education and continuation of professional activity related to lower dynamic of negative changes in SRH.

As expected, SRH was also related to the functional ability, it was determined by coping with daily activities and the level of mobility in the study subjects. It should be underlined that in spite of the advanced age, the participants of the study scored their health status relatively high. It has been observed that on--going treatment for chronic diseases and subjective perception of chronic conditions (complaints on these diseases and a lack of professional home care in the surroundings) had significant effect on self-rated health, however these health determinants seemed to lose their key importance later on at the advanced old age.

In conclusion, presented results described mechanism of changes in self-rated health in advanced age and show the different outcomes of various medical and social determinants in self-assessment of health by the elderly.

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Received February 8, 2005
Received in revised form and accepted May 20, 2005