

## DETERMINANTS OF SELF-RATED HEALTH OF WARSAW INHABITANTS

UWARUNKOWANIA SAMOOCENY STANU ZDROWIA MIESZKAŃCÓW  
WARSZAWY

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## STRESZCZENIE

**Wprowadzenie.** Samoocena stanu zdrowia jest jednopozycyjnym miernikiem powszechnie stosowanym w celu rozpoznania zdrowia postrzeganego subiektywnie i obejmującym szeroki zakres aspektów zdrowia jednostki.

**Cel badań.** Celem naszych badań było określenie, w jakim stopniu samoocena stanu zdrowia odzwierciedla różnice wynikające z cech demograficznych, samopoczucia fizycznego, psychicznego i społecznego, zaburzeń zdrowia, wystąpienia choroby przewlekłej i negatywnych zdarzeń życiowych w polskich warunkach społecznych i kulturowych.

**Material i metoda.** Dane zebrano metodą ankiety nieadresowanej od 402 mieszkańców Warszawy. Ankieta zawierała pytania dotyczące samooceny stanu zdrowia, samopoczucia fizycznego, psychicznego i społecznego, korzystania ze świadczeń opieki zdrowotnej, wystąpienia choroby przewlekłej i zetknięcia się z negatywnymi zdarzeniami życiowymi.

**Wyniki.** Analiza wykazała, że niższa samoocena stanu zdrowia wzrastała wykładniczo wraz z wiekiem i mniej ostro wraz z niższym poziomem wykształcenia. Emeryci byli bardziej skłonni do niskiej oceny własnego zdrowia niż osoby pracujące lub studenci. Różnicy takiej nie stwierdzono w przypadku bezrobotnych. W porównaniu z respondentami pozostającymi w związku małżeńskim, samoocena stanu zdrowia respondentów rozwiedzionych lub owdowiałych była niższa. W odniesieniu do samopoczucia, samoocena stanu zdrowia obniżała się liniowo w przypadku samopoczucia fizycznego, a w przypadku samopoczucia społecznego, a zwłaszcza samopoczucia psychicznego różnice były znaczące, ale bardziej złożone. Hospitalizacja, zwłaszcza wielokrotna, silnie determinowała niską samoocenę stanu zdrowia, zależność między samooceną stanu zdrowia a absencją chorobową lub częstością kontaktowania się z lekarzem była słaba. Choroby przewlekłe znacznie zwiększały ryzyko niskiej samooceny stanu zdrowia, a ich współwystępowanie zwiększało ryzyko w sposób wykładniczy. Chorzy na choroby nowotworowe byli tą grupą, której ryzyko parokrotnie przewyższało ryzyko odnotowane dla innych chorób przewlekłych. Jeśli chodzi o negatywne zdarzenia życiowe, to jedynie doznanie przemy i trudności finansowe powodowały niską samoocenę stanu zdrowia.

**Wnioski.** Wyniki naszych badań potwierdziły użyteczność samooceny stanu zdrowia do badań w zakresie zdrowia publicznego.

## ABSTRACT

**Background.** Self-rated health is a one-point measure commonly used for recognising subjectively perceived health and covering a wide range of individual's health aspects.

**Objective.** The aim of our study was to examine the extent to which self-rated health reflects the differences due to demographic characteristics, physical, psychical and social well-being, health disorders, occurrence of chronic disease and negative life events in Polish social and cultural conditions.

**Material and method.** Data were collected by non-addressed questionnaire methods from 402 Warsaw inhabitants. The questionnaire contained the questions concerning self-rated health, physical, psychical and social well-being, the use of health care services, occurrence of chronic disease and contact with negative life events.

**Results.** The analysis showed that worse self-rated health increased exponentially with age and less sharply with lower level of education. Pensioners were more likely to assess their own health worse than employed or students. Such difference was not found for unemployed. Compared to married, the self-rated health of divorced or widowed respondents was

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lower. Gender does not differentiate self-rated health. In regard to well-being, self-rated health linearly decreased for physical well-being, for social and, especially, for psychological well-being the differences were significant, but more complicated. Hospitalisation, especially repeated, strongly determined worse self-rated health. In contrast, relationship between self-rated health and sickness absence or frequency of contact with physician were lower. Chronic diseases substantially increased the risk of poorer self-rated health, and their co-morbidity increased the risk exponentially. The patients with cancer were the group, in which the risk several times exceeded that reported for the patients of other diseases. Regarding negative life events, only experience with violence and financial difficulties were resulted in worse self-rated health.

**Conclusions.** Our findings confirmed the usefulness of self-rated health for public health research.

## INTRODUCTION

Usually people request physicians for help mainly, when they perceived their health as poor. Therefore, self-rated health (SHR) is a natural and initial measure of individual health. On the other hand, this measure helps general practitioners or clinicians to diagnose and treat patients. Nevertheless, for a long time the self-rated health had been omitted in population studies as an indicator of public health. The systematic investigations conducted on the large representative cohorts randomly selected were undertaken in the seventieth of the 20<sup>th</sup> century by *Kaplan* and *Camacho* in California [35], *Krzyżanowski* and *Wysocki* in Cracov [40] and *Mossey* and *Shapiro* in Manitoba [52]. These and the later studies gave strong evidences that self-rated health as a one-item general indicator of health is a good and independent predictor of mortality and morbidity, stronger than self-reports of existing diseases or even medical records [4, 11, 28, 71]. The early studies were especially focused on elder population and all-cause mortality [29, 35, 48]. The prospective studies later conducted confirmed these findings also in mid-adulthood [38, 43, 50] and among young adult [43, 45]. Moreover, the studies examined predictive value of self-rated health in relation to specific chronic diseases also confirmed usefulness of this indicator [10, 12, 14, 18, 23, 26, 27, 39, 53]. WHO has used self-rated health in the international surveys concerning economical and social determinants of differences in health of adults [61], as well as of children and adolescents [55, 66]. Self-rated health is one of the health indicators adopted by the European Union [15] and has been used in "Health Interview Survey" successively carried on in the member states [22]. It is also applied as a measure of prediction the progress of treatment in clinical trials [26, 49, 54]. In the last years wide range of the investigations on self-rated health was undertaken, from genetic determinants [59], until political [24] and cultural conditions [33, 77].

*Idler* and *Benyamini* [28] presented an interpretation of the phenomenon of usefulness of self-rated health for socio-epidemiological study. Firstly, the self-rated health is a more inclusive and accurate measure of health status than other subjective indicators. This follows from the fact that self-rated health captures the full array

of illness that a person has and possibly even symptoms of disease as yet undiagnosed but present in pre-clinical or prodromal stages. It represents complex judgements about severity of current illness. Moreover, self-rated health reflects individual family circumstances, which enable to perceive the state of his or her health not only from perspective of his or her own well-being, but also taking into account longevity, risk factors and susceptibility to specific diseases occurring in the family. Secondly, self-rated health is a dynamic evaluation, based not only on current level of health, but includes earlier life experiences and their effect on future choices. Thirdly, self-rated health influences behaviour and, in consequence, affects health. Worse self-rated health may leads to abandonment of engaging in prevention efforts or self-care. Moreover, the perception of health as poor may result in failure of recommendation for diagnostic testing, taking medicines and treatment. Fourthly, self-rated health reflects presence or absence of resources that can attenuate decline in health. These resources can include both social factors, for example, income, education, marital status, etc, as well as intra-personal factors, such as coping with stress, depression, etc. [28].

The self-rated health is the one-item indicator, but there are various questions and response options for it's measuring [16]. Perceived health is one of the indicators of the programme "Health for All" creating by World Health Organisation. The question "How is your health in general?" that has five options: "very good", "good", "fair", "bad", "very bad" is recommended as most appropriate for measuring the self-rated health. The use of a comparison with people of the same age is not recommended, because respondents are encouraged to averaging their rating [21]. The self-rated health is also a part of SF-36 HS (Short Form-36 Health Study) questionnaire widely used in international health surveys [70]. In this scale the positive part of evaluation was more enlarged (health: "excellent", "very good", "good", "fair", "poor"). The distribution of data collected in the scale proposed by WHO often demonstrated the left-sized skewness, whereas the distribution of data in SF-36 scale was generally similar to normal distribution, therefore this scale better fulfilled the conditions necessary for using the parametric tests [32]. The usefulness of five-point scale was compared with visual analogue

scale [9] or seven-point scale [13]. Five point scale has been converted into dichotomous scale to assess the risk of worse health created by various factors or the risk of various factors created by worse self-rated health. The ratings “very good” or “good” indicate positive perception of health, and rating “fair”, “bad” or “very bad” negative perception of health [37, 42, 50].

The self-rated health was also used in Poland, in national surveys of adults [6, 46, 76] and adolescents [75], conducted on representative samples, and regional surveys [5, 34, 40, 64], as well as in studies of selected groups, including patients [17, 51], elderly [65], students [44]. However, there are no studies that would enable comparison of the extent to which worse self-rated health is a risk factors of various components of health in the Polish socio-economic and cultural conditions. The multidimensional investigations on subjectively perceived health and its physical, psychical and social determinants were undertaken in Department of Health Promotion and Postgraduate Education of the National Institute of Public Health – National Institute of Hygiene in 2011. The aim of the research presented in the article was to identify the degree to which worse self-rated health is associated with: 1) physical, psychical and social well-being, 2) health disorders, 3) the occurrence of chronic diseases, 4) the experience with negative life events.

## MATERIAL AND METHODS

The cross-sectional study was based on self-reported questionnaire. The data were collected during April – June 2011. The questionnaires with return envelopes were conveyed to 1700 households located in the buildings inhabited at different time in order to obtain the sample varied by age and the level of affluence. All districts were included in proportion to the number of residents. Participation in the study was voluntary and anonymous, the names of recipients of questionnaires were not available for researchers. Data were completed by non-addressed method. Inhabitants returned 406 questionnaires, of which 402 correctly completed were adopted to analyses. Compared to the structure of Warsaw population, in our sample women, older persons (over 44 years), high educated, pensioners and chronically ill were over-represented. This was in line with our expectation, because the general purpose of the study was to identify the health needs especially of those groups, which most frequently utilised the health care. A more detailed description of the sample and the content of questionnaire was presented elsewhere [63].

The original questionnaire for the study was elaborated in Department of Health Promotion and Postgraduate Education of the National Institute of Public Health

– National Institute of Higiene. The question “How would you rate your health?” (responses: “very poor”, “rather poor”, “fair”, “rather good”, “very good”) was used for collected information about self-rated health. Responses were coded from 1 point (“very poor”) to 5 points (“very good”). In order to assess the risk, the scale was divided into two categories: better rated health (responses: “very good” or “rather good”) and worse rated health (responses: “fair”, “rather poor” or “very poor”). The physical well-being scale consisted of the seven most commonly experienced ailments usually accompanied with diseases: headache, tiredness, abdominal pain, palpitations, arthritis pain, backache, sleep disturbance. The assumption was that perceived severity of ailments would not be measured by frequency of appearances in a defined period (for example, in the last two weeks), but relatively to a personal experiences of participants. Therefore, the relative frequency of ailments was measured by a five-point scale from “very often” (1 point) to “very rarely or never” (5 points). The overall scale ranged from 7 points to 35 points, and the higher scores indicated the better physical well-being. The similar procedures were used for constructing the psychical well-being scale. The scale contained the seven items concerning feelings and emotions that, if had frequently experienced or in a long period, were identified as the risk factors for stress-related diseases and chronic mental disorders, namely: anxiety, self-blaming, helplessness, hopelessness, depression, self-dissatisfaction and hostility. The social well-being scale also consisted of seven items. Respondents were asked, to what extent they agree with the statements included in the questionnaire. The statement concerned (statements in parentheses): security (“I feel safe in my everyday life”), communicability (“Contacts with other people are often difficult for me”), protection (“I can rely on the help from relatives”), loneliness (“I often feel lonely”), rejection (“People often criticise me”), sociability (“I like to be with people”) and appreciation (“I feel appreciated by people”). Respondents could choose one of the five responses from “definitely not” (1 point) to “definitely yes” (5 points). The variables based on negative formulated statements (communicability, loneliness and rejection) were re-coded in such a way that all items of social well-being scale were measured in the same direction. The social well-being scale also ranged from 7 points to 35 points, and the higher scores indicated the better social well-being. The internal consistency of physical, psychical and social well-being was found high and *alpha*Cronbach coefficients amounted respectively: 0,77, 0,90 and 0,72. In order to assess the risk of worse self-rated health created by lower physical, psychical and social well-being, the respondents were divided into four groups using quartiles, the responses below lower quartile (I

quartile group), between lower quartile and median (II quartile group), between median and upper quartile (III quartile group) and over upper quartile (IV quartile group). Three indicators were applied for measuring health disorders: remaining at home due to health disorders in the previous year (“never”, “1-2 times”, “more than 2 times”), visiting a physician due to health disorders in the previous year (“never”, “1-2 times”, “more than 2 times”) and frequency of hospitalisation (“never”, “once”, “more than once”). Respondents were asked about occurrence of chronic diseases. For preparation the list of groups of chronic diseases, the principle was assumed that the list should contain the basic groups of diseases covered by ICD-10. Therefore, the following diseases were included: cardiovascular diseases, cancer, digestive diseases, respiratory diseases, diabetes, rheumatoid arthritis, mental disorders, metabolic diseases, occupational diseases and allergic disorders. Respondents were also asked, whether in the previous year they had confronted with problems they assessed as serious. Negative life events were grouped in seven categories: family problems, financial difficulties, lack of opportunity for rest, problems at work (school, college), difficult housing conditions, contact with violence (assault, theft), need to reduce social life.

The statistical programme Epi Info was applied for establishing the database. The analyses of association between self-rated health and selected factors were performed by two ways. Firstly, *Kruskal-Wallis* nonparametric test for mean differences was used for examining, whether the selected factors differentiate self-rated health. Secondly, the risk of worse self-rated health created by selected factors was calculated using odds ratio (OR). Statistical significance of odds ratio was verified in  $\chi^2$  statistics. In addition, the multiple regression analysis was used to test the association between self-rated health and demographic characteristics as well as well-being, and partial coefficients of determination  $R^2$  were presented as percents of explained variance (results in text). Statistical significance was accepted at level  $p < 0.05$ .

## RESULTS

Among the 395 respondents, who answered the question about health status, 35 (8.8%) rated their health as very good, 137 (34.4%) as rather good, 176 (44.1%) as fair, 43 (10.8%) as rather poor and 8 (2.0%) as very poor. Demographic characteristics (except gender) differentiated self-rated health (Tab. 1). The self-rated-health decreased with age. Compared to the youngest group, the risk of worse assessment of health for respondents aged 30-44 years, although was twice higher, but did not reach the level of significance, while in the group aged

45-64 it was eight times higher, and in the oldest group as much as twenty times. The self-rated health of highest educated participants was much more higher than those, who have lower than secondary education. Compared to respondents of tertiary education, the risk of worse self-rated health for those of secondary education was almost three times higher, and for lower educated over three times higher. Regarding the occupational activity, the students and employed highest assessed their health, while pensioners did it lower. Compared to employed, the risk of worse assessment of health for unemployed did not reach the level of significance, while the risk of pensioners was over four times higher and statistically significant. Considerable lower risk for students was caused by the lower age of this group. Marital status also differentiated self-rated health. The lowest assessment was reported for widowed. Compared to the married, who usually was the reference group, the risk of worse self-rated health for the both divorced and widowed was three times higher. The multiple regression analysis, carried out in addition, found out that “age” is a basic variable and explains 15% of variance of “self-rated health”, while variable “education” 2%, and the other variables less than 1%.

The level of physical, psychical and social well-being considerably differentiated self-rated health (Tab. 2). As regards to physical well-being, the relationship took place linearly. The respondents presented worse well-being lower assessed their health. Compared to the respondents, who physically felt the best (IV quartile group), the risk of worse self-rated health for III quartile group increased almost three times, for II quartile group over eight times, and for I quartile group as much as twenty times. Linearity was not confirmed for psychical well-being. Interestingly that the respondents of III quartile group assessed their health highest, and only the rating of participants of I quartile was considerably lower from that of respondents, who psychically felt the best (IV quartile group). Moreover, in comparison to the best feeling respondents, lower well-being did not increase the risk of worse self-rated health. Although the risk of worse self-rated health was half times higher for respondents felt worst, but it did not reach the level of significance. Regarding the social well-being, the differences concerned only the both extreme groups. The respondents perceiving a stronger social support (IV quartile group) considerably higher rating their health, and lowest those, who most strongly perceived lack of support. Compared to IV quartile group only the risk of worse self-rated health for participants of I quartile group was significantly higher (almost three times). The multiple regression analysis, carried out in addition, found out that “physical well-being” is a basic variable, and explains 24% of variance of variable

Table 1. Differences in self-rated health in relation to demographic characteristics

Demographic characteristics	Self-rated health				
	Mean difference <sup>1</sup>		OR	Risk <sup>2</sup> (95% CI)	p
x	p				
Gender		0.651			
Man (n=153)	3.41		1.00		
Woman (n=245)	3.35		1.01	(0.65-1.55)	0.979
Age		>0.001			
18-29 (n=44)	4.11		1.00		
30-44 (n=68)	3.89		2.20	(0.77-6.52)	0.102
45-64 (n=158)	3.29		8.63	(3.38-22.97)	>0.001
65 or more (n=124)	2.92		20.93	(7.69-59.37)	>0.001
Education		>0.001			
Tertiary (n=205)	3.60		1.00		
Secondary (n=149)	3.11		2.81	(1.75-4.50)	>0.001
Elementary or vocational (n=44)	3.22		3.34	(1.54-7.37)	>0.001
Occupational activity		>0.001			
Employed (n=197)	3.60		1.00		
Student (n=18)	4.05		0.25	(0.05-0.96)	0.040
Unemployed (n=23)	3.47		1.35	(0.52-3.51)	0.494
Pensioner (n=159)	2.98		4.08	(2.50-6.70)	>0.001
Marital status		>0.001			
Married (n=265)	3.46		1.00		
Single (n=48)	3.47		0.65	(0.33-1.27)	0.169
Divorced (n=34)	3.14		3.50	(1.38-9.24)	0.003
Widowed (n=49)	2.89		3.54	(1.61-7.97)	>0.001

<sup>1</sup> Kruskal-Wallis test

<sup>2</sup> Odds ratio ( $\chi^2$  test)

Table 2. Differences in self-rated health in relation to physical, psychological and social well-being.

Well-being	Self-rated health				
	Mean difference <sup>1</sup>		OR	Risk <sup>2</sup> (95% CI)	p
x	p				
Physical		>0.001			
IV quartile group (n=75)	3.98		1.00		
III quartile group (n=81)	3.54		2.91	(1.40-6.06)	0.002
II quartile group (n=81)	3.21		8.63	(4.04-18.61)	>0.001
I quartile group (n=88)	2.82		21.13	(8.06-52.89)	>0.001
Psychical		0.003			
IV quartile group (n=83)	3.47		1.00		
III quartile group (n=91)	3.63		0.62	(0.32-1.19)	0.120
II quartile group (n=81)	3.48		1.00	(0.54-1.88)	0.991
I quartile group (n=93)	3.08		1.60	(0.83-3.10)	0.128
Social		>0.001			
IV quartile group (n=87)	3.58		1.00		
III quartile group (n=95)	3.46		1.18	(0.64-2.19)	0.562
II quartile group (n=114)	3.46		1.17	(0.62-2.23)	0.593
I quartile group (n=82)	3.02		2.89	(1.45-5.82)	>0.001

<sup>1</sup> Kruskal-Wallis test

<sup>2</sup> Odds ratio ( $\chi^2$  test)

“self-rated health”, while variable “social well-being” 1%, and variance “psychical well-being” less than 1%.

Table 3 presents the differences of self-rated health in relation to health disorders. The highest self-rated health was noted for respondents, who rarely (1-2 times) remained at home due to sickness or visited a physician. Those, who never were ill and never visited a physician, assessed their health slightly lower, and lowest those, who frequently (over 2 times) were sick and visited a physician. Compared to the never being

sick respondents, the frequently remaining at home due to health disorders increased the risk of worse self-rated health almost five times. However, frequent visits to a physician did not confirm the risk. In regard to hospitalisation, the association took place linearly. As expected, the respondents, who had never been treated in hospital, presented the highest self-rated health, and the lowest those, who were hospitalised more than one time. Compared to the never hospitalised, the single ho-

Table 3. Differences in self-rated health in relation to health disorders.

Health disorder indicators	Self-rated health				
	Mean differences <sup>1</sup>		OR	Risk <sup>2</sup>	
	x	p		(95% CI)	p
Remaining at home due to health disorders		>0.001			
Never (n=123)	3.48		1.00		
1-2 times (n=178)	3.67		0.72	(0.44-1.17)	0.158
More than 2 times (n=81)	2.74		4.82	(2.29-10.31)	>0.001
Visiting a physician due to health disorders		0.024			
Never (n=133)	3.45		1.00		
1-2 times (n=91)	3.53		0.84	(0.48-1.50)	0.526
More than 2 times (n=174)	3.22		1.31	(0.81-2.14)	0.244
Hospitalisation		>0.001			
Never (n=311)	3.47		1.00		
Once (n=60)	3.16		2.16	(1.14-4.13)	0.010
More than once (n=29)	2.65		12.82	(2.86-80-44)	>0.001

<sup>1</sup> *Kruskal-Wallis* test<sup>2</sup> Odds ratio ( $\chi^2$  test)

Table 4. Differences in self-rated health in relation to occurrence of chronic disease.

Chronic diseases	Self-rated health				
	Mean difference <sup>1</sup>		OR	Risk <sup>2</sup>	
	x	p		(95% CI)	p
Do not suffer from chronic disease (n=79)	4.01		1.00		
Cancer (n=20)	2.50		69.29	(8.50-1515.34)	>0.001
Rheumatoid arthritis (n=108)	2.94	>0.001	14.26	(6.57-31.38)	>0.001
Digestive diseases (n=86)	2.97	>0.001	12.04	(5.41-27.18)	>0.001
Cardiovascular diseases (n=196)	3.00	>0.001	11.86	(6.04-23.69)	>0.001
Occupational diseases (n=24)	3.18	>0.001	10.94	(3.36-37.39)	>0.001
Mental disorders (n=68)	3.04	>0.001	10.13	(4.41-23.63)	>0.001
Respiratory diseases (n=39)	3.00	>0.001	9.28	(3.52-25.06)	>0.001
Diabetes (n=42)	2.90	>0.001	8.14	(3.21-21.06)	>0.001
Metabolic diseases (n=75)	3.18	>0.001	6.12	(2.82-13.44)	>0.001
Allergic disorders (n=102)	3.41	>0.001	5.21	(2.53-10.87)	>0.001
Co-morbidity of chronic diseases		>0.001			
1 (n=101)	3.58	>0.001	3.44	(1.68-7.11)	>0.001
2-3 (n=159)	3.14		7.80	(3.95-15.59)	>0.001
4-7 (n=61)	2.76		23.71	(8.67-67.32)	>0.001

<sup>1</sup> *Kruskal Wallis* test<sup>2</sup> Odds ratio (test  $\chi^2$ )

spitalisation increased twice the risk of worse self-rated health, and repeated hospitalisation almost twelve times.

The data included in Table 4 indicated that occurrence of chronic diseases increased the risk of worse self-rated health to a great extent. The lowest self-rated health was noted for participants suffering from cancer, and relatively highest, but significantly lower in comparison to the healthy, for suffering from allergic disorders. Compared to the healthy participants, occurrence of cancer increased the risk of worse self-rated health as much as almost seventy times, rheumatoid arthritis, digestive disease, cardiovascular disease and mental disorders over ten times, and the risk for respiratory disease, diabetes, metabolic disease and allergic disorders was from five to nine times higher. The analysis of co-morbidity of chronic diseases showed that the occurrence of one chronic disease increased the risk of

worse self-rated health over three times, 2-3 chronic diseases almost seven times, and more than 3 chronic diseases over twenty times.

The analysis of influence of negative life events on self-rated health would indicate that only selected of them, probably perceived as traumatic by the participants experienced them, may be the risk factors of worse self-rated health (Tab. 5). Compared to respondents, who did not experience a negative life event, contact with violence (assault, theft) increased the risk of worse self-rated health over two times, and financial difficulties almost two times. The participants, who experienced one negative life events, assessed even higher their health than those without negative live events. Only the respondents, who experienced more than three negative events, rating their health considerably lower, nevertheless, this difference did not reach the level of

Table 5. Differences in self-rated health in relation to occurrence of negative life events.

Negative life events	Self-rated health				
	Mean difference <sup>1</sup>		OR	Risk <sup>2</sup> (95% CI)	p
	x	p			
None negative life events in the previous year (n=83)	3.44		1.00		
Family problems (n=198)	3.31	0.252	1.31	(0.75-2.26)	0.308
Financial difficulties (n=148)	3.16	0.019	1.85	(1.02-3.35)	0.028
Lack of opportunity for rest (n=153)	3.32	0.300	1.27	(0.71-2.26)	0.389
Problems at work (at school, in college) (n=107)	3.59	0.212	0.75	(0.40-1.39)	0.323
Difficult housing condition (n=38)	3.31	0.392	1.52	(0.64-3.63)	0.296
Contact with violence, assault, theft (n=37)	2.97	0.010	2.39	(1.01-6.14)	0.039
Need to reduce social life (n=124)	3.19	0.054	1.67	(0.90-3.09)	0.075
Accumulation of negative life events		0.084			
1 (n=86)	3.53		0.97	(0.51-1.87)	0.928
2-3 (n=149)	3.34		1.12	(0.63-2.00)	0.685
More than 3 (n=82)	3.18		1.77	(0.89-3.53)	0.074

<sup>1</sup> *Kruskal-Wallis* test

<sup>2</sup> Odds ratio  $\chi^2$ (test)

significance. Therefore, the analysis did not confirm that the accumulation of negative life events increased the risk of worse self-rated health.

## DISCUSSION

The findings of our study showed that demographic characteristics, except gender, strongly differentiate the self-rated health. The studies conducted up to the last decade of 20<sup>th</sup> had indicated that women in comparison to men lower assessed their health, although they lived longer, and this phenomenon has been defined as “morbidity paradox” [68]. The evidences was gathered that this difference is partly determined by the lower position of women in public life [58]. In the last twenty years the position of women in many countries has greatly strengthened. Although a part of the studies conducted in the last twenties confirmed the worse self-rated health for women [9, 30, 32, 33], nevertheless, the risk related to gender was not high (up to OR=1.2). It should be noted that these studies were conducted in the Southern European countries (Greece, Italy, Spain), culturally more conservative. On the other hand, such difference was not found in the studies conducted in the Nordic countries, where the position of women is strong [1, 33]. In the Swedish study, in which women were the reference group, significantly frequent the worse self-rated health was found for men (OR=1.5) [42]. If the proposed assumption of the influence of women position on self-rating health would be accepted, our study could indicate that social position of Warsaw women is closer to position of women in the Nordic than the Southern European countries. However, the different results were observed in the study conducted in Lodz, where women significantly lower assessed their health, but the

difference was not large (OR=1.3) [34]. In the earlier studies was reported that the difference in self-reported health increases in adolescence [66, 75] and begins to decrease after 45 years [19]. Therefore, similarly do our sample, the lack of difference was also observed in the studies included the respondents aged over 45 years and conducted in the country distinct economically and culturally (Hungary, France) [38, 71].

The all previous studies found the strong associations between self-rated health, age and education. As in our investigations, the self-rated health usually decreased with age [6, 9, 30, 32, 34, 46]. It should be noted that the study conducted in France showed that the self-rated health increases considerably in the time of retirement and begins slowly to decrease a one year after retirement, and until after seven years returns to that of pre-retirement [71]. The risk of worse self-rated health for Warsaw elderly inhabitants was several times higher than that of noted in the studies conducted in the Western European countries, especially in Nordic countries. The National Health Survey in Spain showed that compared to the youngest group, the risk of worse self-rated health for respondents aged 45-64 years amounted OR=2.12, while for aged over 64 years OR=3.45 (calculated from percent distribution) [30]. The study conducted in Sweden provided interesting results. While the risk for respondents aged 35-49 years was OR=2.0, and for aged 50-64 OR=3.0, it dropped in the older group (aged 65-79 years) to OR=2.2, and considerably increased to OR=5.1 until after reaching 80 years [42]. In our study the chronically sick were over-represented, which could affect the results. Nevertheless, the more frequent prevalence of worse self-rated health among elderly residents of Warsaw may indicate a lower position of elderly in our society, especially in comparison with Nordic countries, where cultural norm and social and health care creates

favourable conditions for old people. Education is, in addition to income, the most widely used measure of socio-economic determinants of inequality in health, including in self-rated health [6, 9, 17, 19, 24, 30-34, 38, 42, 46, 61, 64]. The evidences were found that the differences in self-rated health related to education may be associated with social status achieved by education in the particular community. While the lower education considerably increased the risk of worse self-rated health in Europe, in the Third World countries the risk is much more lower or none [61]. The differences were also noted between European countries. The low level of education increased over three times the risk of worse self-rated health in Austria, United Kingdom or Finland, while in Germany less than two times [41]. Although secondary education increased the risk of worse self-rated health in the studies, in which three levels of education were distinguished, nevertheless, the risk was lower than noted in our study and ranged from OR=1.4 to OR=2.1 [1, 31, 42]. In regard to the risk of worse self-rated health of Warsaw inhabitants associated to lower than secondary education, it corresponded with the findings of other studies, in which the risk ranged from OR=3.2 to OR=3.5 [1, 31]. The risk noted in the study conducted in Lodz was a little lower, for secondary education OR=1.70 and for elementary education OR=2.75 [34]. As mentioned earlier, education lower increased the risk of worse self-rated health in the communities of poorer socio-economic conditions, therefore, the possible impact of disadvantage of Lodz (higher unemployment) on observed difference should be taken into consideration [56].

The influence of occupational activity on self-rated health was of interest to numerous research [1, 6, 13, 17, 19, 34, 46, 71]. The worse self-rated health was found to be related to the lack of job satisfaction [13] or lower position in the occupational hierarchy [71]. Our study did not confirm that unemployment significantly increases the risk of worse self-rated health. The studies conducted abroad, even in the same country, showed conflicting results, what could be caused by changes on the labour market [1, 42]. Compared to our study, in Lodz the risk of worse self-rated health for unemployed was twice higher, what probably due to three times higher rate of unemployment in Lodz than in Warsaw [34, 56]. The considerable risk of worse self-rated health for pensioners observed in our study confirmed also the other studies, and in Swedish investigations the value of risk was even substantially higher (OR=20.6) [42]. It should be noted that the prospective study conducted on the same cohort found that the period of retirement (from one year before retirement to one year after retirement) can considerably encourage the improvement of self-rated health [71]. As regards to marital status, the married persons have usually been the reference

group [31, 42, 46, 60, 71]. The risk of worse self-rated health for singles did not differ significantly in our study, what confirmed also the other studies [31, 42, 46]. The risk related to divorced and widowed seems to be more complex. The Finnish study found higher risk for divorced men (OR=1.55), but not for widowed men (OR=1.04), while for women, conversely, the risk of widowed was higher than for divorced (respectively: OR=1.53 and OR=1.20) [31].

In our investigations the self-rated health demonstrated strong association with physical, psychical and social well-being, however physical dimension of well-being was predominant factor. The majority of previous studies confirms our findings [13, 33, 43, 47, 60, 67, 71]. *Mavaddat* et al. in the study carried out in the United Kingdom reported more than twice higher risk of worse self-rated health increased by poor physical well-being in comparison to psychical and social well-being (respectively: OR=3.7, OR=1.4, OR=1.8) [47]. The high risk increased by poor physical well-being was observed in Finnish – Italian study. The frequent occurrence of single somatic symptom increased the risk of worse self-rated health three times for Tampere inhabitants and five times for Florence inhabitants, and a more number of symptoms increased the risk twelve times for the both samples [33]. As regards to the study concerning the influence of psychical factors or social support, the risk of worse self-rated health was found a low or none [43]. The study conducted by *Westerlund* et al. may suggest that during the transition to retirement psychical well-being affects the self-rated health as well as physical well-being. The authors reported OR=1.86 for the risk of worse self-rated health increased by fair psychical well-being, while for fair physical OR=1.39, and for poor well-being respectively: OR=2.99 and OR=2.32 [71].

Our study indicates that treatment of health disorders influences the self-rated health, if its causes are so severe that hospitalisation or frequent remaining at home is necessary. The quality of health care may influence the association between self-rated health and utilising of medical services. The study simultaneously conducted in France and United Kingdom showed that in France, where health care system were assessed as one of the best in the world, the correlation between self-rated health and sickness absence was much lower than in United Kingdom, where health care system has required the permanent modifications (respectively:  $r=0.13$  and  $r=0.35$  for men and  $r=0.16$  and  $r=0.36$  for women) [7, 8, 60]. *Westerlund* et al. reported, similarly to us, that only a long sickness absence (more than 21 days in the last year) increases considerably the risk of worse self-rated health (OR=2.52) [71]. As regard physician visits, the classic study conducted by *Millunpalo* et al. found that 3-5 visits in the last year as well as more



than 5 visits did not significantly increase the risk of worse self-rated health (men respectively: OR=1.34 and OR=1.14, women respectively: OR=1.51 and OR=1.02) [50]. The further studies also confirmed these findings [67]. Our earlier study did not demonstrate an association between self-rated health and various factors related to physician visits [17]. However, it should be noted that in the study focused on elderly the stronger influence of visiting a physician on self-rated health was observed. Compared to elderly never visited physician in the last year, for those who visiting at least 1 time the risk of fair self rated health increased 2-3 times, and the risk of poor self-rated health over 4 times [62]. Our findings would indicate that physician visits do not increase the risk of worse self-rating health, moreover, respondents who visiting a physician 1-2 times in the last year rated their health highest. This would indicate the need to regular control the own health to feel healthy. The previous studies confirmed the influence of hospitalisation in the last year on self-rated health. Similarly to our findings, *Kennedy* et al. as well as *Wolinski* and *Tierney* reported the twice higher risk of worse self-rated health related to a single hospitalisation, while frequent hospitalisation increased the risk several times [36, 74]. The other studies suggest that the risk is not determined by a quality of health care, assessment of hospital staff or other factors concerning the treatment, but by severity of disease [17, 25].

The chronic disease is the important risk factor for worse self-rated health. The risk for occurrence a disease reported in the other studies, regardless of its nature, ranged from OR=2.0 to OR=2.5, while for three or more diseases from OR=5.9 to OR=6.6, and these results correspond with our findings [32, 33, 71]. Compared to the previous studies, in our investigations the much more higher risk of worse self-rated health increased by particular diseases was noted, especially for cancer. In the studies conducted on the large samples the risk of worse self-rated health ranged for: cardiovascular diseases OR=1.9 – OR=6.0 [27, 30, 37, 45, 64], respiratory diseases OR=2.0 – OR=3.8 [27, 30, 45], diabetes OR=1.8 – OR=3.7 [27, 45], rheumatoid arthritis OR=2.8 [45], mental disorders OR=4.0 – OR=5.1 [45, 71], cancer OR=1.3 – OR=5.2 [27, 45]. This difference largely results from the fact that in our research the reference group was the healthy respondents, whereas in the most previous studies conducted also in Poland [64] the reference group was the both healthy and suffering from some other chronic disease. In our study the risk for cancer was revealed as a several times higher than that of the other chronic diseases. This would indicate a grater feeling of threat experienced by patients with cancer in Poland, which may be associated with worse prognosis compared to other countries and may lead to labelling by disease [73]. *Barger* and *Mooldoon* found

that labelling can influence the self-rated health to a greater extent than a disease itself [2]. It is important that patients covered by the programmes of prevention and treatment of cancer were aware that they can lead active life in the same way as patients suffering from the other chronic diseases, because, as the studies has shown, the cancer patients who feel less severity of disease, better able to adapt to their disease [72].

The influence of negative life events on onset of disease and the risk of sudden death was confirmed strongly [3, 57, 69]. The studies that used summarised scales of negative life events found weak correlation between negative life events and self-rated health [19, 60]. Our research also confirmed these findings, the risk of worse self-rated health increased not just the accumulation of events, but occurrence of the selected single events (financial difficulties, violence). The impact of the economic conditions on self-rated health was the most frequently examined event [9, 34, 41, 42]. In the less affluent countries of the Southern Europe the risk of worse self-rated health for the citizens of low income was noted a higher than in the Western and Northern Europe. The risk in Greece was OR=1.3, while in Germany OR=2.2, Finland OR=2.7, Sweden OR=3.4, Netherlands OR=3.7 and United Kingdom OR=3.9 [9, 41]. The findings of our investigations would indicate that the influence of poor financial situation of Warsaw inhabitants is somewhat higher than in Greece, but lower than in Western and Northern European countries. In the Lodz study the risk was slightly higher than in our research (compared to high-income people, the risk for middle-income was OR=1.8, while for low-income OR=2.7), what would be caused by greater risk of unemployment in this town [34, 56]. The experience with violence of Warsaw inhabitants increased twice the risk of worse self-rated health. The similar influence of violence on self-rated health was reported among the Swedes, for violence in public place (OR=1.9) as well as for domestic violence (OR=2.1) [42].

## CONCLUSIONS

Our study showed that self-rated health includes the various aspects of health, which would indicate the following noted associations:

1. Self-rated health strongly differentiates the respondents varying in age, education, occupational activity and marital status.
2. Physical well-being influences self-rated health to a greater extent, while psychical and social well-being lower.
3. Hospitalisation, especially repeated, and long sickness absence considerably decreases self-rated health.

4. Self-rated health indirectly enables to assess a severity of chronic diseases. Compared to healthy people, the risk of worse self-rated health is several times higher for chronically ill, especially for cancer patients.
5. The serious negative life events, such as contact with violence or financial difficulties may influence the self-rated health. Our findings confirms the usefulness of self-rated health for public health research.

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